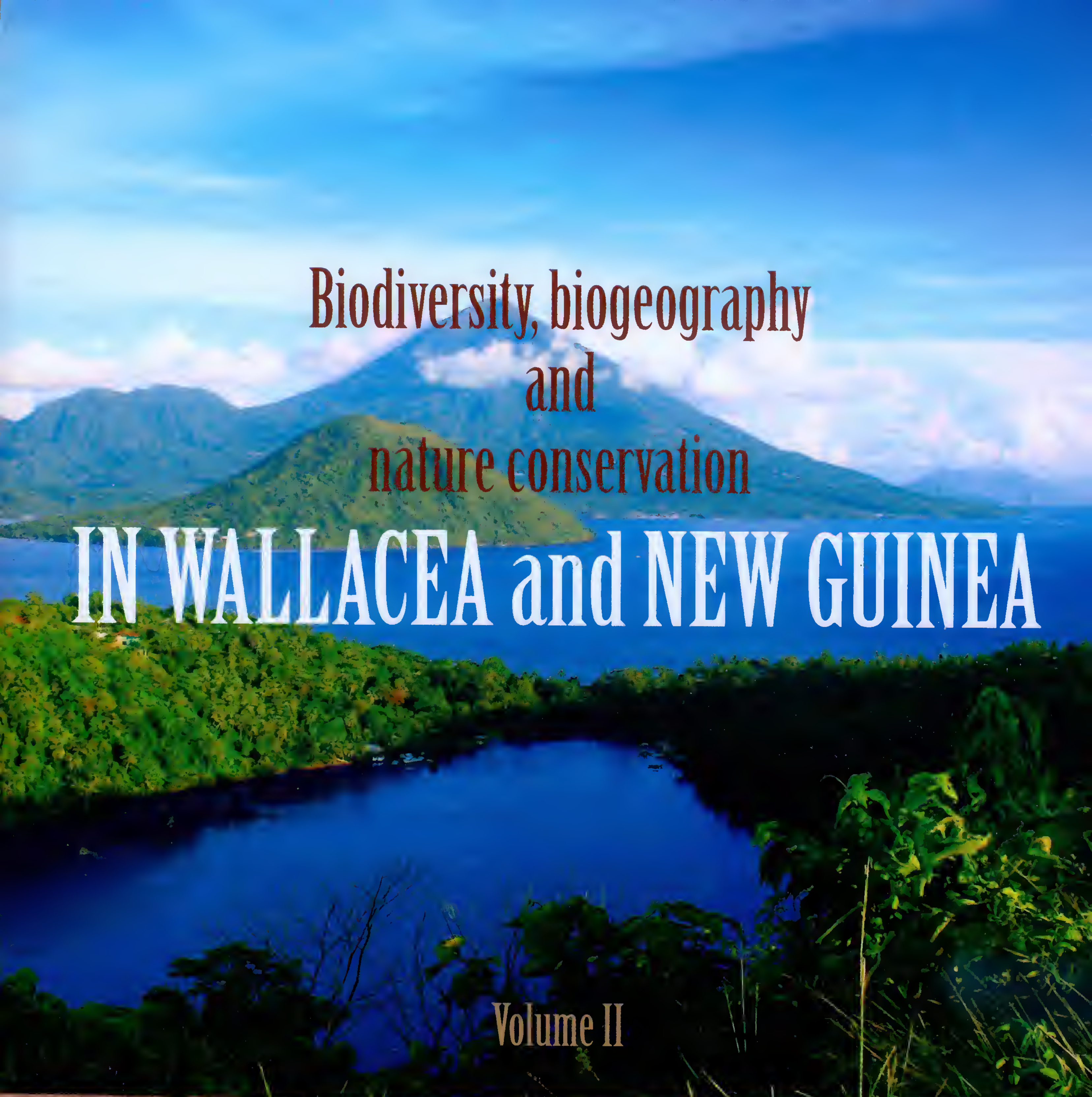

Biodiversity, biogeography and nature conservation IN WALLACEA and NEW GUINEA

Volume II

executive editor
Dmitry Telnov

The Entomological Society of Latvia
Riga, 2014

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Title page: View of the islands of Maitara and Tidore from the slopes of Gamalama Volcano, Ternate, with Lake Laguna in the foreground (photo: A. Krisnamurti, 2012) on a background of traditional wood carving by Lake Sentani Papuans.

This volume commemorates

100+1 years after Mr. ALFRED RUSSEL WALLACE

(1823 - 1913)

Portrait of Alfred Russel Wallace by Dutch artist Jacques Grégoire (© J. Grégoire).

Contents

Foreword: Wallace and Wallacea

Maxwell V.L. Barclay

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In November 2013, the 100th anniversary of his death, a bronze statue of Alfred Russel Wallace was unveiled at the Natural History Museum, London. His *New York Times* obituary called him 'the last of the giants', so it is fitting that Wallace should be commemorated alongside Owen, Darwin, Huxley and Banks, but unlike their statues, Wallace is in the museum gardens in the prime of life, net in hand, hunting butterflies through the Moluccan jungles. That seems right for an adventurer who lived in the field for months at a time with few comforts, in pursuit of specimens and knowledge. He supported his travels by collecting and writing and his years in South East Asia yielded more than 120 000 specimens and several books. His '**Malay Archipelago**', remarkable for the picture it paints of the creatures, people and places he encountered, has been in print for nearly 150 years. Tens of thousands of his specimens have filtered down through the estates of their original purchasers into the collections of the Natural History Museum and other great museums, where they still teach us about the fauna and flora of these islands before a century and a half of deforestation.

Wallace would have approved of this excellent series of books. Although he sold most of his specimens, he described some taxonomically beforehand. His monograph on the cetoniine scarabs of the Malay Archipelago, with descriptions of 70 new species, remains an essential reference for anyone working on these beetles. The butterflies he named include the magnificent (not uncommon) *Trogonoptera brookiana* after his friend James Brooke, the 'White Rajah of Sarawak', and the famous Golden Birdwing, *Ornithoptera croesus*, saying '*my heart began to beat violently, the blood rushed to my head, and I felt ... like fainting*' - an excellent description of a sensation that many entomologists will recognise. The clarity and accessibility of his writing shines out amongst scientists of all generations.

Bronze statue by Anthony Smith, commissioned by the Wallace Memorial Fund and unveiled at the Natural History Museum, London by Sir David Attenborough, 7 November 2013 (photo: M. Barclay).

Wallace was justly famous when he died, but over the 20th century his memory began to fade. Today, he is best remembered for his letter outlining his theories of species divergence, which came close enough to 'natural selection' to spur Darwin into publication of the '**Origin of Species**'. This is often used to suggest a conflict between the two men that never existed, for in reality they respected and admired each other. After 101 years, it is perhaps time to reflect on the whole of Wallace's life's work, and not forget his vast contributions to so many widely varying fields of science and human endeavour, the enormous wealth of ideas and specimens he left to the world, and his biogeographical studies that leave an area of some 350 000 square kilometres, the subject of this interesting and important book, bearing the name 'Wallacea'.

Editorial

More than two years have passed since Volume 1 of this book series first saw the light, virtually nothing in terms of the history of life on Earth or even of the evolution of human life. In the short lifespan of a 'typical' Homo sapiens, two years can pass almost without remark, but from the point of view of technical and other human progress, two years can have a huge effect, sometimes a critical one for our understanding, knowledge and experience. A hundred +1 years have passed since Mr. Alfred Russel Wallace OM FRS was among us. Perhaps nowadays the changes and impact on the natural environment of our planet in two years can be greater than in a good hundred years in the past. 'Conservation drones' are now used to monitor poaching activity in India [1]. Smartphones provide on-line monitoring of illegal logging in South America and equatorial Africa [2]. Global use of satellites to track logging, forest cover changes and foliage loss is 'nothing special' anymore. The first 20 hectares of oak pasture woodlands, key habitat for the EU protected Hermit beetle have been restored in Latvia [3]. Such a list can go on, but, are we still doing something wrong? Despite our goodwill, destruction of the global natural heritage and disappearance of wildlife continues, if not increases, year by year. Sounds like a never ending spiral...

Sometimes I ask myself: 'Is it possible to explore like Wallace today?' The instant reaction is 'No! There are no more unmapped islands, no wild tigers in Singapore, no unvisited mountains on the Malay Peninsula, and even all the bird of paradise species have been filmed by professionals'. But this kind of answer is just an emotion. There remains huge scope for biological exploration all over the World. There are still intact forests and unvisited swamps, and only a proportion of species have been scientifically named or barcoded. Now we have opportunities to travel much faster than in Wallace's time. Our technical equipment allows us to track and study species digitally, almost every meter of Earth's surface has been photographed by satellites. Our new colleagues in the countries Wallace visited so many years ago are now studying, evaluating and protecting their nature. And the previously unimaginable efficiency of digital data exchange contributes vastly to science and conservation.

But only educated communities are able to understand the true value of nature. This book series aims to be an organ of education, one of instruments to change our world. The world that has already changed. *Our changing world!*

Dmitry Telnov, *PhD.*
The Entomological Society of Latvia
[written in Palermo, Sicily, 18 March 2014]

Type specimen of *Euryomia bella* (Coleoptera: Scarabaeidae: Cetoniinae) from Batchian (now Bacan), collected and described by A.R. Wallace, with his characteristic circular locality disc. Now in the collection of Natural History Museum (photo: H. Maratheftis, BMNH).

1 - http://news.mongabay.com
2 - Trivedi M. "Can communities monitor their own forests?" Global Canopy Programme: http://www.globalcanopy.org/updates/blogs/can-communities-monitor-their-own-forests
3 - EU LIFE10 project No. NAT/LV/000159, http://for-rest.daba.gov.lv

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All papers are peer reviewed, so **I take this opportunity to thank all our competent anonymous referees and consultants!**

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For once in the spotlight: Alfred Russel Wallace

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Abstract: The British naturalist Alfred Russel Wallace (1823-1913) is, together with Charles Darwin, the co-discoverer of the theory of evolution by natural selection and established the scientific foundation for biogeography. At the end of his life he was one of the most well known scientists in the world, nowadays he is almost forgotten by the general public. This chapter focuses on Wallace, his life and his achievements. For once Wallace is out of Darwin's shadow, and in the spotlight.

Key words: Alfred Russel Wallace, Charles Darwin, Sarawak Law, Ternate essay, evolution, biogeography, Aru islands.

'Are you looking for something?' the old man on the veranda asked. He had observed me closely, while I walked up and down the street in the city of Ternate, on a perfect volcano island with the same name in the Moluccas.

A dirty white singlet covered his big belly. He pulled it up and stroked his bare belly like a pregnant woman: gently and carefully.

'The house of Wallace, Alfred Russel Wallace,' I answered the man. 'It supposed to be somewhere near here.'

'Ah, wait a second,' he said, and yelled inside his house.

Seconds later a young tall slender boy came out and walked with me in the direction of the mighty Gamalama volcano. A few hundred meters up the road he stopped.

'This is it,' he said, while pointing at a new looking house.

I was rather disappointed. In his book *The Malay Archipelago* (1869) Wallace gave a quite precise description of the house and its location, and I simply could not believe that the modern looking house was that specific house. The house Wallace rented during the years he spent in the eastern part of the Malay Archipelago, and where he returned to after spending months in the jungle, rearranging his collections and recovering from tropical diseases.

But who was Alfred Russel Wallace, and why put such an effort into finding this specific house in Ternate?

Alfred Russel Wallace was born on January 8th 1823, into a middle class English family in a little village close to Usk, Monmouthshire. He was the eighth of nine children. The first years of his life were carefree, until his father lost the modest family capital with some poor investments and bad speculations. The consequence of it this was that Wallace had to leave school at the age of fourteen, thus ending his formal education. From that moment an academic career was out of reach.

In 1837 he found a job as a trainee land surveyor at the company of his elder brother William. While roaming the English and Welsh countryside, Wallace developed a passion for geology and natural history.

Six years later, in 1843, his brother could no longer afford to employ Wallace, as there was not enough work available. A few months later Wallace found a job as a teacher in a school in Leicester, where he met Henry Walter Bates, who was an ardent beetle collector. Together they read books on natural history, discussed scientific topics and collected beetles and other insects in the countryside around Leicester.

In 1845 Wallace read the anonymously published book *Vestiges of the Natural History of Creation*. He was intrigued by the idea of species transmutation discussed in the book, the author of which was only revealed to be Robert Chambers many years later.

Wallace and Bates fantasized to go on an expedition to a tropical country. The trade in exotic birds and insects was flourishing, with a great demand for exotic species.

After reading *The voyage of the Beagle* by Charles Darwin and William Henry Edwards *Voyage up the River Amazon, with a Residency at Pará*, they decided to travel to South America and collect birds and insects in the Amazon, both for their private collections and to sell in order to fund their trip. In a letter to Bates, Wallace revealed his scientific plan:

I begin to feel rather dissatisfied with a mere local collection - little is to be learned by it. I sh[d.] like to take one family, to study thoroughly - principally with a view to the theory to the origin of species.

They left England in 1848, and collected a couple of months together in the lower Amazon before they decided to split up and collect independent. In 1849, Wallace's younger brother Herbert travelled to the Amazon to assist him. Two years later, in 1851, Herbert decided that collecting was not what he wanted, and went back to Pará. Before he was able to join a vessel back to England he caught yellow fever and died.

Wallace heard the sad news much later. He travelled up the Rio Negro, further than any European before him.

After four years of collecting, Wallace decided to return to England. He travelled back to Pará, visited the grave of his brother and checked in on board the brig "Helen", a cargo ship loaded with rubber, cocoa, balsam etc.

After almost four weeks into the voyage, in the middle of the Atlantic Ocean, the ship caught fire. Wallace was able to grab a tin box with a few drawings of fish and palm trees, a couple of shirts and his watch from his cabin, before he jumped into a lifeboat. Not long after the "Helen", including his diaries and stuffed animals, sank before his eyes. In a letter to his friend and colleague Richard Spruce Wallace wrote:

My collections however were in the hold & were irrevocably lost. And now I began to think, that almost all the reward of my four years of privation & danger were lost. (...) All my private collection of insects & birds since I left Pará was with me, & contained hundreds of new & beautiful species which would have rendered (I had fondly hoped) my cabinet, as far as regards American species, one of the finest in Europe.

Luckily 10 days later a passing ship rescued Wallace and the crew, and they eventually reached England (after almost sinking in a storm on the way!). But instead of slipping into a depression, Wallace was upbeat. He wrote two books (one on palm trees and one about his South-American voyage), lectured to scientific societies and looked for a new tropical destination to build up a new collection of specimens.

In 1854, within eighteen months after his return from South America, Wallace left England for The Malay Archipelago, a white spot on the map of exploration. Charles Allen, a young boy that he taught how to pin insects and shoot and skin birds, accompanied him.

He started his journey in Singapore (where the tigers still roared in the jungle on Bukit Timah), followed by peninsular Malaysia, before he ended up in Sarawak, Borneo. Here he combined collecting with writing (scientific) papers, which he sent to magazines or to his agent Samuel Stevens. During the rainy season, when collecting was not possible, he dedicated his time to the big question of the origin of species. With this issue on his mind he wrote 'On the Law which has regulated the Introduction of New Species'. In this article, in which he included ideas on geology and geography, he formulated what is now known as his 'Sarawak Law':

Every species has come into existence coincident both in time and space with a pre-existing closely allied species.

In this article Wallace was not able to provide a mechanism to explain how species evolve, but it paved the road for the next step.

Darwin read the article, published in 1855 in 'The Annals and Magazine of Natural History', but thought it was nothing new. Sir Charles Lyell, leading geologist and friend of Darwin, later pointed out the importance of it to him and urged Darwin to publish his ideas on the origin of species.

But it was to late. In 1858, three years after the publication of the Sarawak Law, Wallace wrote an essay entitled: 'On the Tendency of Varieties to Depart Indefinitely From the Original Type'.

Days before he completed the Ternate essay, as it is known today, Wallace was suffering from malaria. He says in *Natural Selection and Tropical Nature*:

At the time I was suffering from a rather severe attack of intermittent fever at Ternate in the Moluccas, and one day while lying in my bed during the cold fit, wrapped in blankets, though the thermometer was at 88°F., the problem again presented itself to me, and something let me to think of the "positive checks" described by Malthus in his "Essay on Population," a work I had read several years before, and which had me deep and permanent impression on my mind. These checks - war, disease, famine and the like - must, it occurred to me, act on animals as wall as on man. Then I thought of the enormously rapid multiplication of animals, causing these checks to be much more effective in them than in the case of man; and while pondering *vaguely on this fact there suddenly flashed upon me the idea of the survival of the fittest - that the individuals removed by these checks must be on the whole inferior to those that survived.*

After Wallace was recovered he wrote the ideas down in three successive evenings, and sent them immediately to Darwin, with whom he had corresponded. In the accompanying letter he asked him to send the essay to Lyell, at least if he thought it was worth reading.

When Darwin received the letter from Wallace he must have felt devastated, as shown by a letter he wrote to Charles Lyell:

My dear Lyell,

Some year or so ago, you recommended me to read a paper by Wallace in the Annals, which had interested you & as I was writing to him, I knew this would please him much, so I told him. He has to day sent me the enclosed & asked me to forward it to you. It seems well worth reading. Your words have come true with a vengeance that I sh^{d} be forestalled. You said this when I explained to you here very briefly my views of 'Natural Selection" depending on the struggle for existence. - I never saw a more striking coincidence. If Wallace had my M.S. sketch written out in 1842 he could not have made a better short abstract! Even his terms now stand as Heads of my Chapters.

Please return me the M.S. which he does not say he wishes me to publish; but I shall of course at once write & offer to send to any Journal. So all my originality, whatever it may amount to, will be smashed. Though my book, if it will ever have any value, will not be deteriorated; as all the labour consists in the application of the theory.

I hope you will approve of Wallace's sketch, that I may tell him what you say.

My dear Lyell
Yours most truly
C. Darwin

Darwin was overwhelmed by the Ternate essay, and did not know what to do. His friends Charles Lyell and the botanist Joseph Dalton Hooker proposed to Darwin to read two manuscript fragments of Darwin's writings on evolution plus the Ternate essay before the Linnean Society, and then publish them in the Society's Journal. Hooker prepared the publication as one can see from the following letter:

My dear Hooker,

I have read your letter & see you want papers at once. I am quite prostrated & can do nothing but I send Wallace & my abstract of abstract of letter to Asa Gray, which gives most imperfectly ***only*** *the means of change & do not touch on reasons for believing species do change I daresay all is too late. I hardly care about it. - But you are too generous to sacrifice so much time & kindness. - It is most generous, most kind. I send sketch of 1844* ***solely*** *that you may see by your own handwriting that you did read it. - I really cannot bear to look at it. - Do not waste much time. It is miserable in me to care al all about priority. - The table of contents will show what it is. I would make a similar, but shorter & and more accurate sketch for the Linnean Journal. - I will do anything.*

God Bless you my dear kind friend. I can write no more. I send this by servant to Kew.

Yours C. Darwin

Hooker and Lyell finally presented Darwin and Wallace's 'joint' paper to the Linnean Society on the 1st July 1858. It was entitled: *On the Tendency of Species to form Varieties; and on the Perpetuation of varieties and species by Natural Means of Selection*.

Neither Darwin nor Wallace was present during the public reading. Darwin sadly attended the funeral of one of his children, while Wallace was still in the Malay Archipelago.

The reactions were as one can expect. One of the members of the Society, professor Samuel Haughton from Dublin, commented on the printed version of the papers. In his autobiography, Darwin summarized the reception of the papers as: 'All that was new was false, and what was true was old.'

It was more than a year and a half of turmoil for Darwin, starting with the Ternate essay in his mailbox in June 1858 and ending with the publication of his book *The Origin of Species* in November 1859. The question is why Darwin waited so long before publication of his own theory. I can think of two reasons: first he himself was his own biggest critic. He wanted to gather as much evidence to support the idea of evolution before he publishing the theory of natural selection. Therefore he conducted experiments in his backyard and in his greenhouses, he discussed his ideas with his scientific friends like Huxley, Hooker, Lyell and the American botanist Asa Gray (who read one of the first sketches on evolution by natural selection), and he corresponded with people who were able to provide him with information from all over the world. His idea was to write it all down in one book on evolution. Of course this idea was harshly disturbed by Wallace's essay. Another reason why he did not want to publish might have been the church. Religion was strongly involved in the social class Darwin comfortably lived in. In a letter to Joseph Hooker, Darwin famously wrote that it (the idea of evolution by natural selection) felt like confessing to a murder.

Even within Down House religion was strongly present, since Darwin's wife Emma was very religious. It was 'the important subject' between them, as Emma called it, and she strongly believed that Darwin could be a believer, if he stopped questioning.

Rivalry and plagiarism

One often hears the accusation of plagiarism by Darwin: that he copied ideas from Wallace's Ternate essay into his own writings. The main issue is when exactly Darwin received Wallace's letter and did he keep it to himself for several days or weeks before sending it to Lyell and Hooker? According to a study by John van Wyhe and Kees Rookmaaker (New Theory to Explain the Receipt of Wallace's Ternate Essay by Darwin in 1858) published in the *Biological Journal of the Linnean Society* in 2012 Darwin received Wallace's letter and essay when he said he did, so he would not have had an opportunity to steal ideas from it.

A more interesting question though, is whether Darwin (and Lyell and Hooker) should have asked Wallace for permission before publishing the Ternate essay, since Wallace did not ask Darwin to publish it, but only asked him to send it to Lyell.

Is it ethical to publish someone's ideas without asking for permission? No, I would say.

On the other hand, it does not seem that Wallace had problems with the publication, and it does not seem that he blamed Darwin for publishing his text. In 1869 he dedicated *The Malay Archipelago* to Darwin, stating: 'As a token of personal esteem and friendship, but also to express my deep admiration for his genius and his works.'

Twenty years later, in 1889, he published a book about the theory of evolution by natural selection and its applications, entitled *Darwinism*, out of respect for Darwin (although it is quite likely that the term 'Darwinism' was synonymous with 'evolution by natural selection', and not used by Wallace as an homage to Darwin).

In his acceptance speech for the reception of the first (gold) Darwin-Wallace medal from the Linnean Society in 1908, Wallace said the following:

With your permission I propose to make a few remarks both as to the actual relations between Darwin and myself prior to July 1858, and also to some peculiarities of our respective life-histories which brought about those relations, and which will, I hope, be both novel and of some general interest.

Since the death of Darwin in 1882, I have found myself in the somewhat unusual position of receiving credit and praise from popular writers under a complete misapprehension of what my share in Darwin's work really amounted to. It has been stated (not unfrequently) in the daily and weekly press, that Darwin and myself discovered "natural selection" simultaneously, while a more daring few have declared that I was the first to discover it, and that I gave way to Darwin!

In order to avoid further errors of this kind (which this Celebration may possibly encourage), I think it will be well to give the actual facts as simply and clearly as possible.
The one fact that connects me with Darwin, and which, I am happy to say, has never been doubted, is that the idea of what is now termed "natural selection" or "survival of the fittest," together with its far-reaching consequences, occurred to us independently, and was first jointly announced before this Society fifty years ago.

But, what often is forgotten by the press and the public, is that the idea occurred to Darwin in October 1838, nearly twenty years earlier than to myself (in February 1858); and that during the whole of that twenty years he had been laboriously collecting evidence from the vast mass of literature of Biology, of Horticulture, and of Agriculture; as well as himself carrying out ingenious experiments and original observations, the extent of which is indicated by the range of subjects discussed in his 'Origin of species,' and especially in that wonderful store-house of knowledge - his 'Animals and Plants under Domestication,' almost the whole materials for which works had been collected, and to a large extent systematised, during that twenty years.

Figure 1. Greater Bird of Paradise (*Paradisaea apoda* Linnaeus, 1758), drawn by the French illustrator Jacques Barraband, published by François LeVaillant in 1806 (© Artis Library, Special Collections of the University of Amsterdam).

Figure 2. Lesser Bird of Paradise (*Paradisaea minor* Shaw, 1809), drawn by the French illustrator Jacques Barraband, published by François LeVaillant in 1806 (© Artis Library, Special Collections of the University of Amsterdam).

Of course, one might say that this text was read during a public appearance, and therefore Wallace was being courteous.

But in 1858, fifty years before he received the Darwin-Wallace medal and when he was still in the Malay Archipelago, Wallace sent a letter to his mother. When reading the letter, it seems that Wallace had no problems with the publication of the manuscript by the Linnean Society. Indeed it filled him with pride and hope for the future, back in England:

I have received letters from Mr Darwin & Dr Hooker, two of the greatest most eminent Naturalists in England which has highly gratified me. I sent Mr Darwin an essay on a subject in which he is now writing a great work. He shewed it to Dr Hooker & Sir C Lyell, who thought so highly of it that they immediately read it before the "Linean [sic!] *Society". This insures me the acquaintance and assistance of these eminent men on my return home.*

It is more than 150 years since the publication of the joint paper by Darwin and Wallace, and *The Origin of Species*, and there is no doubt that these two publications have changed our view of the world and its creation radically. With their theory, Wallace and Darwin gave us a plausible alternative for the biblical story of creation. New techniques, like DNA, have confirmed and strengthened the ideas of the two British naturalists. Every day new research is conducted and presented in conferences, in scientific journals or in books like this: *Biodiversity, Biogeography and Nature Conservation in Wallacea and New Guinea*, which furthers our understanding of the evolution of life on our planet.

The distribution of animals

The fact that Wallace jointly published the theory of evolution by natural selection with Darwin should have in itself justified a state funeral in Westminster Abbey and a statue in central London (neither of which he got), but it is not all he contributed to biology.

One of the most fascinating aspects of Wallace is the fact that at the same as he was writing about evolution he was also developing new ideas about biogeography, or the study of distribution of animals and plants.

In the first four years in the Malay Archipelago Wallace travelled from West to East and observed two completely different faunas. In a letter he sent from Ambon to his friend and former travel companion Henry Walter Bates, a few weeks before he wrote the Ternate essay, Wallace described his observations about animal distribution:

In this archipelago there are two distinct faunas rigidly circumscribed, which differ as much as those of South-America and Africa, and more than those of Europe and North-America: yet there is nothing on the map or on the face of the islands to mark their limits. The boundary line often passes between islands closer than others in the same group. I believe the western part [of the Archipelago] to be a separated portion of continental Asia, the eastern the fragmentary prolongation of a former Pacific continent.

After he returned to England after eight years in the Archipelago, he presented his elaborated ideas before the Royal Geographical Society, including the idea of a sharp line that divides the two faunal regions:

To define the limits of the two regions where they are (geographically) most intimately connected, I may mention that during a few days' stay in the island of Bali I found birds of the genera Copsychus, Megalaima, Tiga, Plocius and Sturnopastor, all characteristic of the Indian region and abundant in Malacca, Java, and Borneo; while on crossing over to Lombock, during three months collecting there, not one of them was ever seen; neither have they occurred in Celebes nor in any of the more eastern islands I have visited. Taking this in connexion with the fact of Cacatua, Tropidorhynchus and Megapodius having their western limit in Lombock, we may consider it established that the Strait of Lombock (only 15 miles wide) marks the limits and abruptly separates two of the great Zoological regions of the globe.

This line is now known as the Wallace Line. Thomas Henry Huxley coined the term in an article published in the *Proceedings of the Zoological Society*, in 1868.

Actually, Wallace was not the last to draw a line through the archipelago to divide the faunal regions. In 1977, the American palaeontologist George Gaylord Simpson published a paper in the *Proceedings of the American Philosophical Society*, with the provocative title 'Too many lines; The Limits of the Oriental and Australian Zoogeographic Regions.'

In this article Simpson described seven differ-

Figure 3. Wallace's Standardwing (*Semioptera wallacii* Gould, 1859), from the birds of New-Guinea, published by John Gould (© Artis Library, Special Collections of the University of Amsterdam).

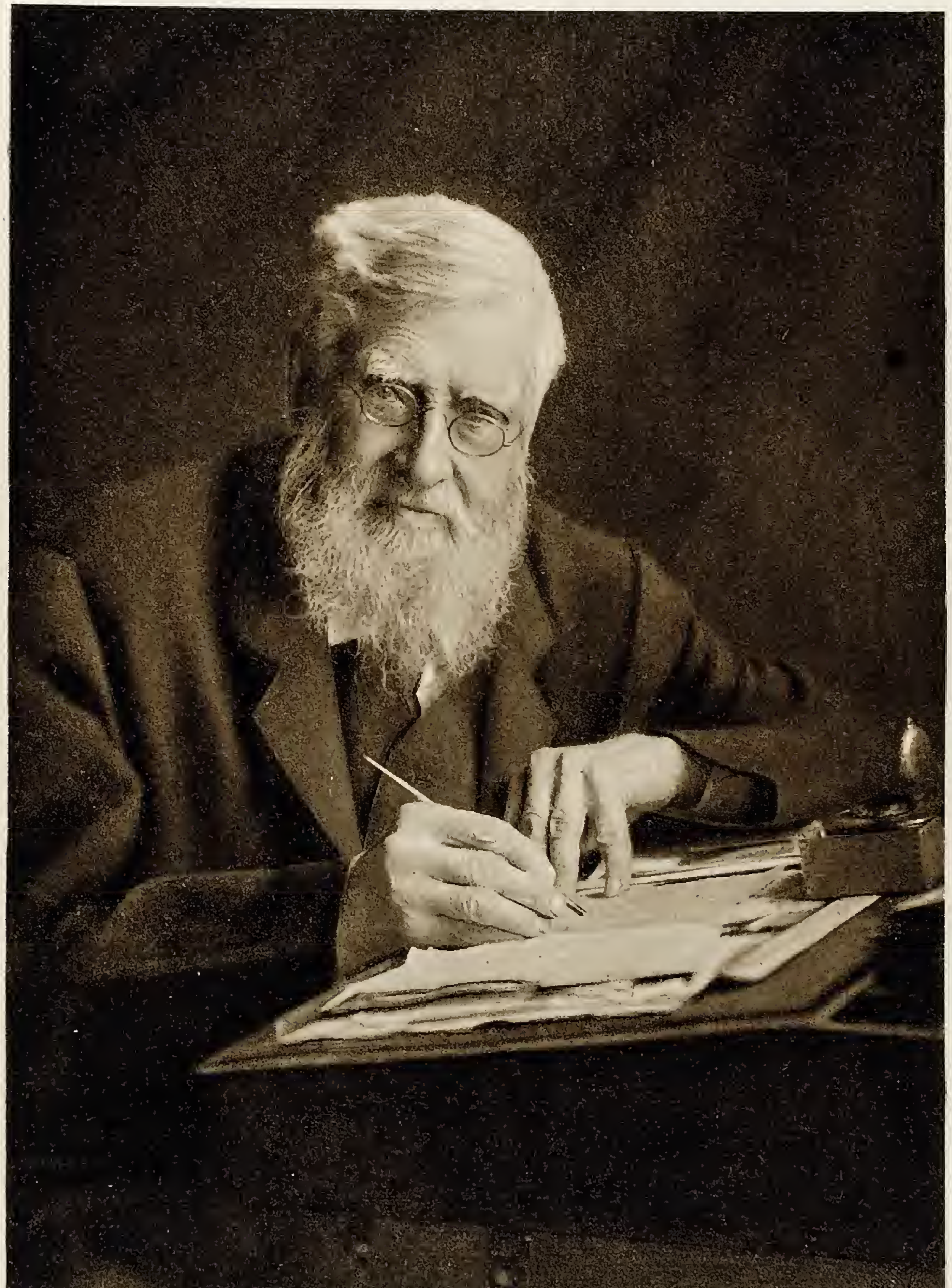


Photo : Debenham and Gould

A. R. WALLACE (1913)

Figure 4. Photograph of Alfred Russel Wallace, at the end of his life (© Artis Library, Special Collections of the University of Amsterdam).

Figure 5. Part of the map with biogeographic regions, published in 'The Geographical Distribution of Animals' (© Artis Library, Special Collections of the University of Amsterdam).

ent lines in the Malay Archipelago. The result is a kind of spaghetti if one draws all the lines on one map. But above all it raises the question which one is the correct one?

In January 2013 an international group of scientists under the direction of Dr Ben Holt published an article in *Science*: 'An Update of Wallace's Zoogeographic Regions of the World.' Regarding the exact line dividing the Oriental and Australian regions they concluded that its location is determined by the technique used to do the analysis and faunal group that is analysed. But they were in favour of two lines: the Wallace Line, and the Weber line as modified by Ernst Mayr, which runs through the ar-

Figure 6. *Ornithoptera croesus* Wallace, 1859, drawn by Ria Winters, published in the book 'Reizen tussen de lijnen' by Alexander Reeuwijk (© Uitgeverij Atlas Contact).

chipelago east of the Wallace Line. Of course the article by Dr. Holt and colleagues is not a final paper on this complex and topic. About a half-year after publication, German scientists Holger Kreft and Walter Jetz commented on the article in Science. They questioned the new realms as proposed by Holt and colleagues. Kreft and Jetz state that it is too premature accept the new zoogeographic regions. Scientists should be careful to redefine new realms, since the analysing techniques are not fully developed yet.

This is all hard-core science, not accessible for the general public. Wallace served the broad audience, since in a way one can read *The Malay Archipelago* (1869), as an explanation of biogeography for a non-scientific audience. But Wallace wrote much more than this on biogeography. He published several articles and produced two scholarly books on the subject: *The Geographical Distribution of Animals*, a two-volume edition published in 1876, and *Island Life*, published in 1881. With these works Wallace provided a scientific basis for the study of biogeography, and it earned him the nickname 'father of biogeography'.

In his typical 'fin-de-siècle' overview, 'Biogeography on the eve of the twenty-first century: Towards an epistemology of biogeography', Francois Vuilleumier summarized Wallace's merits by quoting David Quammen:

Wallace did nothing less than establish the foundation of a science of biogeography, a foundation that has lasted well into the 20th century. Not only did he describe all the major patterns of distribution known at the time, including continental and insular patterns, disjunction patterns and dispersal pathways, but also he offered evolutionary explanations for them. The breadth and depth of Wallace's thinking cannot be overemphasised. What I consider especially significant is that Wallace's understanding of biogeography was based on extensive fieldwork.

Wallace's Standard Wing and Golden Bird Wing

It may seem that Wallace started as an insect and bird collector in England and South America, and ended up as a theoretician in the Malay Archipelago, with evolution by natural selection and biogeography as his main subjects, but this is incorrect. Wallace kept collecting through his eight years in Southeast Asia. He returned to England with more than 125 000 specimens, of which thousands were new to science.

His most famous specimens were perhaps Wallace's Standardwing (*Semioptera wallacii* Gould, 1859, the bird of paradise he discovered) and the Golden Birdwing butterfly (*Ornithoptera croesus* Wallace, 1859), he caught in Bacan, a little island next to Halmahera.

Nowadays, the easiest location to observe both specimens is Halmahera, the largest island of the Moluccas, not far from Ternate. There, in a little house along a river, lives bird specialist and protector of the forest, Demianus Bagali or Pak Anu.

The taxi boats to Halmahera leave every morning from the little quay beside the mosque in the centre of Ternate city. It is a short boat ride, of about 30 minutes, across the Molucca Sea. The island looks green; flanks of the volcanoes are covered with trees.

From the harbour village of Sindangoli it is a 15-minute ride on a motorbike to Pak Anu. He offers me a bed and is willing to show me the 'lek', the display tree of the bird of paradise.

That night I read the passages about the discovery of the bird in *The Malay Archipelago*. At first Wallace thought his boy Ali fooled him:

Just as I got home I overtook Ali returning from shooting with some birds hanging from his belt. He seemed much pleased, and said, "Look here, sir, what a curious bird," holding out what at first completely puzzled me. I saw a bird with a mass of splendid green feathers on its breast, elongated into two green glittering tufts; but what I could not understand was a pair of long white feathers, which stuck straight out from each shoulder.

Ali had to convince Wallace that the bird was real. He than realised that he just got a new bird of paradise, and described it and sent it to the British Museum. Curator George Robert Gray (1808-1872) named the bird Wallace's standard wing.

The next morning we crossed the river before sunrise. A Moluccan Scops Owl (*Otus magicus* (Müller, 1841)) flew silently over our heads. After a tough 45 minutes walk we reached an empty riverbed. One bird of paradise was calling, though it sounded still weak. As soon as the call was louder we walked to the observation platform up the hill. Although its voice was loud and clear, the bird itself was not more than an outline between the leaves. When the sun came up, the metallic green feathers glittered in the morning light.

Finally five male birds showed up and sat on the bare branch, calling, jumping, hopping and turning. They played with their iridescent green breast shields and their white feathers, the standards, were erected and trembled. This went on for several minutes, until suddenly one of the birds could not contain himself any longer. He flew straight up from the branch, while he sang ecstatically. Then he opened his wings and used them as a parachute to land exactly where he took off. The others followed.

After an hour of display the only female left the lek. The males kept on calling, without success. She did not return.

'In Galela, one of the local languages of Halmahera, the bird is called 'wecca wecca', and in Bahasa Indonesia it is called 'Burung bidadari', the 'fairy bird', Pak Anu told me with a smile on his face. 'I came up with that last name. Nowadays it is the official Indonesian name.'

I asked Pak Anu whether it was possible to observe the golden birdwing butterfly, and if he knew a place to find it.

'That should not be a problem,' Pak Anu assured me, as we walked back from the forest. 'It is a rather common butterfly here. The best place to find it is along the old logging road, where you will also find the paradise crow, the other bird of paradise of Halmahera. I will take you there.'

I had seen the golden bird wing once, in a drawer in the personal cabinet of Wallace, now in the Museum of Natural History, in London. Evolutionary biologist and director of the Wallace Correspondence Project, George Beccaloni, showed me the butterfly. He pointed out a fingerprint on the velvety black part of one of its wings. Unnoticed it sealed my faith. From that moment I decided that I wanted to see the butterfly alive in Indonesia.

A few days later I found out that Pak Anu was right. I walked along the old logging road, with Eclectus Parrots (*Eclectus roratus* (Müller, 1841)) and fruit doves (*Ptilinopus* sp.) in the trees, when suddenly a large dark object appeared in my sight. It was a birdwing, hovering over the road. I followed it for some time, before it flew over the bushes into the forest:

I found it to be as I had expected, a perfectly new and most magnificent species, and one of the most gorgeously coloured butterflies in the world. Fine specimens of male are more than seven inches across the wings, which are velvety black and fiery *orange, the latter colour replacing the green of the allied species. The beauty and brilliancy of this insect are indescribable, and none but a naturalist can understand the intense excitement I experienced when I at length captured it. On taking it out of my net and opening its glorious wings, my heart began to beat violently, the blood rushed to my head, and I felt much more like fainting than I have done when in apprehension of immediate death.*

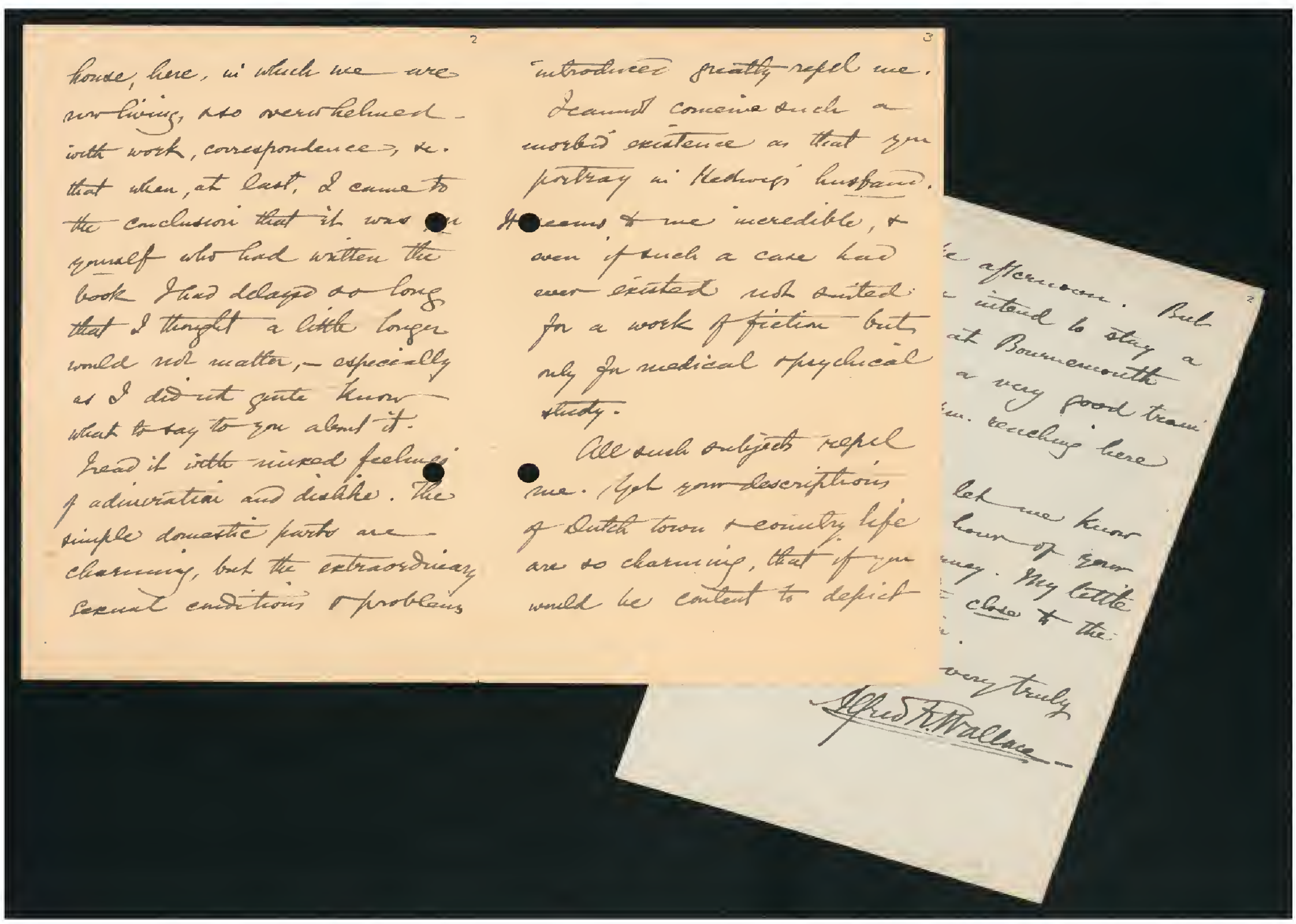
This lyrical description of the butterfly is typical for Wallace, as is the sentence that followed the enthusiastic part: 'I had a headache the rest of the day (...).'

Fortunately these two magnificent animals, described in *The Malay Archipelago* are rather easy to observe. That does not count for all the animals described. In fact, one can read *The Malay Archipelago* not just as a travel book, a natural history book or an exposé on biogeography, but it can also be read as a reference for nature conservationists. For instance, Wallace wrote about the tigers in Singapore that killed a Chinese everyday, about the fact that rhino's 'abound' in Sumatra, about the large numbers and different species of butterflies in Batimurung, Southern-Sulawesi and about the babirusa's he tried to shoot just outside Manado in Northern-Sulawesi.

Books like *The Malay Archipelago* and the book you are reading at the moment make us aware of the vulnerability of nature. Just remember that there are now no wild tigers in Singapore, the Sumatran rhino (*Dicerorhinus sumatrensis* (Fischer, 1814)) is one of the most endangered species in the world (the Javan rhino, *Rhinoceros sondaicus* Desmarest, 1822) is rarer, but the population is more stable compared to the Sumatran rhino), the only butterflies you are likely to see in Bantimurung are for sale at the entrance of the park, and if you want to see a babirusa (*Babyrousa* sp.) you will have to travel about two days from Manado to see them, in a heavily protected area; and this has all happened in just a little over 150 years.

In search of the Greater Bird of Paradise

For the last leg of my journey in Wallace's wake I travelled to the Aru Islands, a little archipelago in the shallow sea between Papua and Australia. I learned about the islands by reading Wallace. It immediately felt a romantic idea: sailing to the Aru's.



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house, here, in which we are now living, also overwhelmed with work, correspondence, &c. that when, at last, I came to the conclusion that it was you yourself who had written the book I had delayed so long that I thought a little longer would not matter, — especially as I did not quite know what to say to you about it.

I read it with mixed feelings of admiration and dislike. The simple domestic parts are charming, but the extraordinary sexual conditions & problems

3

introduced greatly repel me. I cannot conceive such a morbid existence as that you portray in Hedwig's husband. It seems to me incredible, & even if such a case had ever existed not suited for a work of fiction but only for medical & psychical study.

All such subjects repel me. But your descriptions of Dutch town & country life are so charming, that if you would be content to depict

...e afternoon. But ... intend to stay a ... at Bournemouth ... a very good train ... reaching here ... let me know ... hour of your ... way. My little ... close to the ...

... very truly

Alfred R. Wallace

Figure 7. Letter from Alfred Russel Wallace to the Dutch author Frederick van Eeden (© Artis Library, Special Collections of the University of Amsterdam).

When looking at the map one might think that the Aru Islands consist of one large island and several satellite-islands. A closer look shows little lines that divide the large island into smaller ones, like cracks in a Chinese vase.

In his article 'On the Natural History of the Aru Islands', published in *The Annals and Magazine of Natural History* in January 1858, Wallace explained the connection between the island of New Guinea and the Aru archipelago, based on these channels:

But there is another circumstance still more strongly proving this connexion: the great island of Aru, 80 miles in length from north to south, is traversed by three winding channels of such uniform width and depth, though passing through an irregular, undulating, rocky country, that they seem portions of true rivers, though now occupied by salt water, and open at each end to the entrance of the tides. This phænomenon is unique, and we can account for their formation in no other way than by supposing them to have been once true rivers, having their source in the mountains of New Guinea, and reduced to their present condition by the subsidence of the intervening land.

This idea is supported by the fact that the fauna of the Aru Islands is quite similar to that of the southern part of New Guinea.

I travelled to Maekor, a little protestant village on an island of the same name. Three local hunters took me deep into the jungle and showed me tree kangaroos, different species of cuscus, palm cockatoos and all kinds of parrots. But above all they brought me to the display trees of the Greater Bird of Paradise (*Paradisaea apoda* Linnaeus, 1758). Early in the morning I observed the male birds singing, dancing and displaying their creamy white and yellow feathers to the nearby females. Immediately I recalled the engraving of the Aru islanders hunting for birds of paradise in *The Malay Archipelago*. The hunters climbed up trees and from under a roof of leaves they shot the birds with bows and blunt arrows.

I showed the image to my company. They laughed about it.

'Our grandfathers used to hunt like that, until about 35 years ago,' one said. 'But nowadays we simple use airguns; more easy and much more effective.'

The last bird of paradise I saw in the jungle of Maekor was the King Bird of Paradise (*Cicinnurus regius* (Linnaeus, 1758)), a lovely crimson red and white bird, with coin-like feathers at the end of its two elongated tail wires. The delicate dance was overwhelming, and I fell in love immediately. So did Wallace. When he first saw this bird of paradise in the forest of the Aru Islands he became poetic and lyrical:

The remote island in which I found myself situated, in an almost unvisited see, far from the tracks of merchant fleets and navies; the wild, luxuriant tropical forest, which stretched far away on every side; the rude uncultured savages who gathered around me - all had their influence in determining the emotions with which I gazed upon this "thing of beauty" (the king bird of paradise, AR). I thought of the long ages of the past, during which the successive generations of this little creature had run their course - year by year being born, and living and dying amid these dark and gloomy woods, with no intelligent eye to gaze upon their loveliness; to all appearance such a wanton waste of beauty. Such ideas excite a feeling of melancholy. It seems sad that on the one hand such exquisite creatures should live out their lives and exhibit their charms only in these wild, inhospitable regions, doomed for ages yet to come to hopeless barbarism; while on the other hand, should civilised man ever reach these distant lands, and bring moral, intellectual, and physical light into the recess of these virgin forests, we may be sure that he will so disturb the nicely-balanced relations of organic and inorganic nature as to cause the disappearance, and finally the extinction, of these very beings whose wonderful structure and beauty he alone is fitted to appreciate and enjoy. This consideration must surely tell us that all living things were not made for man. Many of them have no relation to him. The cycle of their existence has gone on independently of his, and is disturbed or broken by every advance in man's intellectual development; and their happiness and enjoyments, their loves and hates, their struggles for existence, their vigorous life and early death, would seem to be immediately related to their own well-being and perpetuation alone, limited only by the equal well-being and perpetuation of the numberless other organisms with which each is more or less intimately related.

This is not only beautifully written but, in my opinion, a prophetic message from *The Malay Archipelago*. Animals are not made for man, but for each other. And when (the 'civilized') man enters their habitat, there is a great chance that the ecological balance will be disturbed.

Darwin versus Wallace

Still one question is yet unanswered: How is it possible that almost everybody knows Darwin, whilst few people know Wallace?

An often-heard explanation for this fact is the difference in class, with Darwin from upper-middle class while Wallace was from the lower-middle class.

Maybe it was not the class difference itself, but a consequence of it: due to his father's poor speculations and investments, Wallace had to leave school and earn money at a very young age. He had to sell (some of) his collected specimens to finance his expeditions, while Darwin was from a very wealthy family, and was able to dedicate all his time and energy to his scientific work. It is reflected in both of the naturalists' oeuvres. As a guest researcher of the Special Collections of the University of Amsterdam, I frequently work in the Artis Library, one of the finest Natural History libraries in The Netherlands. As an experiment I tried to collect together the works of Darwin and Wallace. Darwin was easy. His oeuvre was grouped, together with related publications, in two bookcases next to a bust of the great naturalist.

Wallace's works were more difficult to gather together, since his oeuvre is scattered through the whole library, with his books on evolution closely positioned to those of Darwin, *The Geographical Distribution* and *Island Life* in the Biogeography section, while *The Malay Archipelago* and *A Narrative of travels on the River Amazon and Rio Negro* can be found on the shelves of the travel section. Several book titles, like *The Wonderful Century* and *Is Mars Habitable?* and *The Revolt of Democracy* can not even be found in the collection, since they are not works on natural history. In the depot (the former stables for the zebra's of the nearby zoo), out of sight to the public, are the volumes with magazines and annals of scientific societies. Here, the majority of the hundreds of articles written by Wallace can be found, including the joint publication of Darwin and Wallace from 1858, in the *Proceedings of the Linnean Society*.

The Dwarf's House

Hereby, I conclude this chapter on Alfred Russel Wallace, which, I have to confess, is far from complete. I have not discussed his problems concerning evolution by sexual selection, his ideas about the colouring of animals, or his spiritualism, on which he wrote the fascinating 'The Scientific Aspects of the Supernatural.'

But let me finish this piece how I started it: the housing issue. Because, at last one of Wallace's houses in the Malay Archipelago can be visited - although it is a rebuilt one. Tony Whitten (of Fauna & Flora International) and Dick Bergsma (of Seatrek Bali) commissioned a group of local carpenters in the village of Yenbeser, on the island of Gam in the Raja Ampat archipelago, to build a little house just like the one Wallace lived in during his six weeks stay on the island. They looked carefully at the engraving of the house in *The Malay Archipelago*, and used the measurements from the clear description that Wallace himself gave in his book:

It was quite a dwarf's house, just eight feet square, raised on posts so that the floor was four and a half feet above the ground, and the highest part of the ridge only five feet above the floor.

Between the posts under the floor Wallace had put a table, chair, shelves and his insect boxes. He was able to work there, although he had to crawl to reach the chair and table. When you look carefully at the engraving in the book you can actually see Wallace sitting in his wicker chair.

The newly built house looks almost identical to the house on the engraving. The only difference is that you will not find Alfred Russel Wallace working between the posts. Unfortunately.

PostScript

Currently the forests of the Aru Islands, home to the tree kangaroo (*Dendrolagus* sp.), the Greater Bird of Paradise (*Paradisaea apoda* L.) and the Palm Cockatoo (*Probosciger aterrimus* Gmelin, 1788), is under serious threat.

The Java based company 'PT Menara' is planning to cut about 70% of the forest, to grow sugarcane. The logging has already started on the southern most island Tranggan...

Acknowledgements

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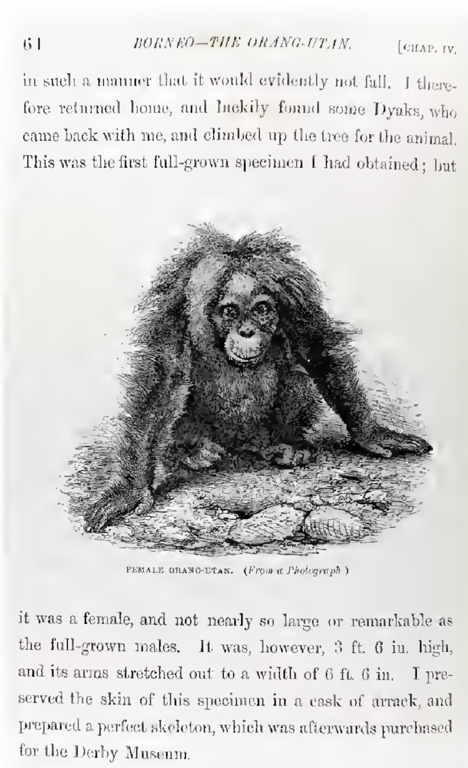


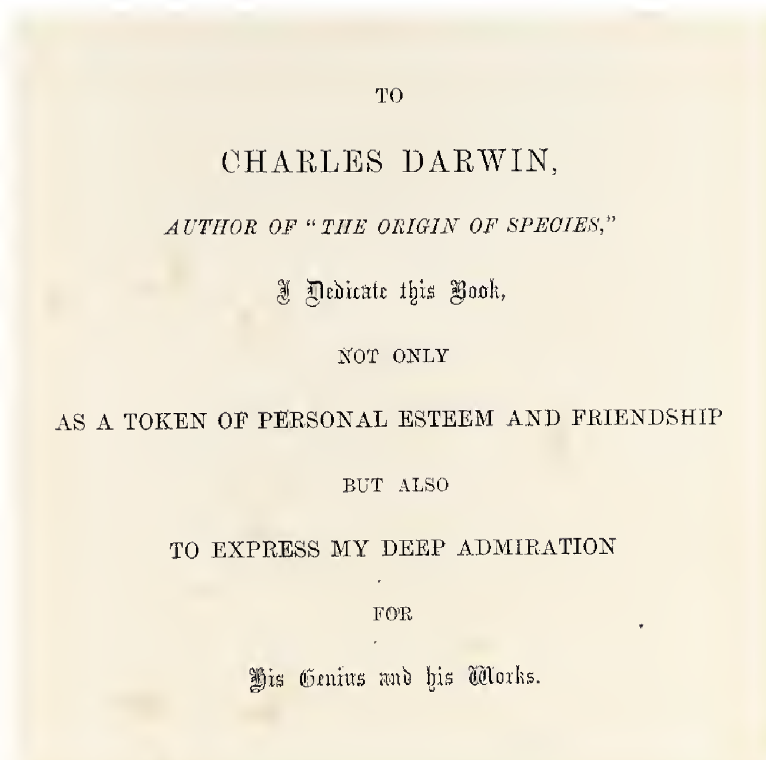
64 *BORNEO—THE ORANG-UTAN.* [CHAP. IV.

in such a manner that it would evidently not fall. I therefore returned home, and luckily found some Dyaks, who came back with me, and climbed up the tree for the animal. This was the first full-grown specimen I had obtained; but

FEMALE ORANG-UTAN. (*From a Photograph.*)

it was a female, and not nearly so large or remarkable as the full-grown males. It was, however, 3 ft. 6 in. high, and its arms stretched out to a width of 6 ft. 6 in. I preserved the skin of this specimen in a cask of arrack, and prepared a perfect skeleton, which was afterwards purchased for the Derby Museum.

Figure 8. Illustration of an Orangutan (*Pongo* sp.), from 'The Malay Archipelago' (© Artis Library, Special Collections of the University of Amsterdam).



TO

CHARLES DARWIN,

AUTHOR OF "THE ORIGIN OF SPECIES,"

I Dedicate this Book,

NOT ONLY

AS A TOKEN OF PERSONAL ESTEEM AND FRIENDSHIP

BUT ALSO

TO EXPRESS MY DEEP ADMIRATION

FOR

His Genius and his Works.

Figure 9. Dedication to Darwin, in 'The Malay Archipelago' (© Artis Library, Special Collections of the University of Amsterdam).

Figure 10. Replica of Wallace's hut in Gam Island, Raja Ampat archipelago (shown with the original engraving from 'The Malay Archipelago') (photo: S. Bali).

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Figure 11. Cover of author's book 'Travelling between the lines' (Dutch edition).

Biogeography of Southeast Asia (and Wallacea) scorpions, a review

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Abstract: Biogeographic patterns observed among modern scorpions are the consequence of different major events which can be integrated in the schematic scales proposed by M. Udvardy. The distribution of the principal modern groups (i.e. families and genera) is derived from elements (protofamilies and protogenera of Pulmonate-Neoscorpionina) which originated in Pangea. The main factor in the phylogenetic/palaeobiogeographic scale was probably not the latitudinal and longitudinal overland migration (dispersion) of the ancestors Neoscorpionina, which followed the predominantly southward shift of the warm tropical belt, but a rather more passive vicariant process in association with dispersal in Haffer's sense, in response to the progressive fragmentation of Pangea. This was followed by continental drift which led to the present configuration of the continents and climates. This suggestion seems to be in accordance with the very poor vagility observed in modern scorpions. On the millennial scale, Pleistocene and post-Pleistocene biogeography has been responsible for the regional level of the distribution pattern which, during its settlement, has led to the selection of some new specific lineages and to the extinction of others. On the secular scale, the ecological biogeography is a consequence of recent natural or anthropic events. This scale has been little used by scorpion biogeographers, mostly because of lack of data on scorpion life history strategies. In this chapter, examples from Southeast (and Wallacea) scorpions are proposed for and discussed in relation to the three biogeographic scales of Udvardy.

Key words: Scorpion, Southeast Asia, Wallacea, biogeography, Pangea, Laurasia, Gondwanaland, Pleistocene, ecology.

Introduction

As already mentioned in previous publications (Lourenço 1996, 2003), some studies on scorpion biogeography are by no mean recent. Attempts began with the contributions of Pocock (1894a), Kraepelin (1905) and Birula (1917). Certain general patterns of distribution were then proposed, even though the viewpoints of the different authors were frequently not in agreement. These preliminary general contributions have been followed more recently by regional biogeographical studies such as those by Mello-Leitão (1945), Vachon (1952), Koch (1977), Francke (1978), Lamoral (1979) and Couzijn (1981). Nevertheless, most of these studies were enable to demonstrate precise biogeographical patterns. More recent studies, dealing mainly with Neotropical scorpions, make it possible to define some precise biogeographic patterns for these organisms (Lourenço 1986a,b, 1994, 1996a, 2002a,b, 2003). The definition of these has been possible thanks to

(i) a better knowledge of the phylogeny of several groups of scorpions (Lourenço, 2002a);

(ii) the application of recent hypothesis concerning climatic vicissitudes, especially in tropical biomes during the late Cenozoic and Pleistocene periods (Prance, 1982a);

(iii) a much better knowledge of scorpion life history strategies (Lourenço, 1991). According to Polis (1990) and Lourenço (1991) most, scorpions can be defined as being equilibrium species, presenting therefore very predictable patterns of distribution.

In two recent papers (Lourenço 1996a, b), a more detailed biogeographical model was proposed, based on Udvardy's (1981) division of biogeography into three spatio-temporal entities. This approach was adopted because it is both clear and didactic. Using it three major biogeographical events can be suggested to explain most of the patterns of distribution observed among scorpions today.

Scorpion biogeography patterns

1. Phylogenetic scale: palaeobiogeography

The phylogenetic scale encompasses the evolutionary time of all biota and is limited in space only by the size of the earth (Udvardy 1981). On this scale, only historical factors can be assumed to have take place since, for almost all ecological conditions, data are largely or totally unknown. At this level, the evolutionary process of biogeography is, to a considerable extent, a tributary of continental drift and plate tectonics. This new view shook to the foundations the theories of many older paleontologists and biogeographers (Udvardy 1981).

Few authors (e. g. Lamoral 1979, 1980; Couzijn 1981; Nenelin & Fet 1992; Lourenço 1996a, b; Monod & Lourenço 2005) have taken continental drift into consideration when discussing aspects of regional biogeography. Lamoral's (1980) suprageneric classification of recent scorpions, with discussion on their zoogeography, was an important attempt to explain the general patterns of scorpion biogeography. The zoogeographical suggestions which Lamoral made are generally acceptable: (1) the present global scorpion fauna is derived from elements of the pulmonate (Neoscorpionina) that originated in Laurasia and Gondwanaland during Pangean times, (2) the protobuthids were the dominant fauna in Pangea, and the distribution of present Buthidae is the result of a vicariant process emanating from the fragmentation of Laurasia and Gondwanaland; (3) other early ancestors of scorpions such as the Chaeriloids, Chactoids, Pseudochactoids and Scorpionoids, also evolved in Laurasia and/or Gondwanaland in this past-period. The more detailed conclusions of Lamoral (1980) are mainly correlated with vicariance and with continental drift. Lamoral (1980) failed, however, to explain some important points. There is no doubt that he insisted too much on the role of dispersion when affirming that two major factors have influenced speciation and distribution patterns. One is the fragmentation of Pangea and Gondwanaland; the other is the movement of Laurasian elements to the North of Gondwanaland. This second factor should be reconsidered. The process of 'active' dispersion should rather be interpreted as being a more 'passive' process in Haffer's (1981) dispersal sense (To avoid making the subject too long, I do not discuss here the arguments of Platnick (1976), Udvardy (1981) and Haffer (1981) regarding their personal opinions about the meaning of both dispersion and dispersal (see also Lourenço 1986b)). This argument can be supported by the poor vagility presented in modern species of scorpion (it might be suggested that primitive or aquatic scorpions were better able to disperse than terrestrial forms. They were therefore able to reach many of the shores of Pangea before and during the fragmentation process, since scorpions remained marine (or aquatic) from the Silurian until at least the Triassic (Briggs 1987; Shear & Kukalová-Peck 1990; Lourenço 1991)). Present biogeographic patterns may be considered more as the result of different vicariant processes, and as some pieces of an incomplete puzzle. Lamoral did not answer the question about the 'apparent anomalies in the distribution of some groups of families and genera'. These 'anomalies' have been discussed since the publication by Pocock (1894a). Even today the disjunctive distributions of several families and genera of scorpions remain unexplained. The cases of the present disjunctive distribution of some scorpion groups should be regarded as the result of the previous distribution of protoelements of families and genera, followed by a vicariant process. The exact mechanism of the process has not, however, yet been explained.

Consequently, it can be suggested that the main event responsible for the biogeographic patterns of distribution of scorpions, on a palaeogeographic scale, was the fragmentation of Pangea and subsequent continental drift. The difficulties in explaining the significant discontinuous distribution of some familial and generic groups point not only to the great geological age of these groups, but also to the relict faunas and biogeographical patterns which they exhibit today.

2. Millenial scale: Pleistocene biogeography

Between the development of the earth's crust and the Pleistocene epoch several events took place, many of which were related to the continuous drift of the continents. Without citing an exhaustive list, the following can be mentioned: mountain building, differential erosion, epicontinental seas, climatic-vegetational fluctuations, changes of world sea level and the formation of major river systems. All these events took place during the Cenozoic over a period of 60 My, and have influenced the present biogeographical patterns of scorpions. In this section special reference is made to one of these events, climatic-vegetational fluctuation, which played a major role since the late

Cenozoic and which has had a major impact during Pleistocene times (for a better understanding of the astronomical basis of the climatic oscillations - 'Milankovitch cycles' - see Haffer (1993)). For more details of the consequences of the other events, refer to Haffer (1981).

For many years, books and papers about the tropical regions have stated that the biogeographical and diversity patterns observed in these regions could be explained by the long stability of tropical forests over millions of years (Federov 1966; Richards 1969). Subsequent work on geology, paleoclimates and palynology, especially in Amazonia and Africa (Prance 1982a; Moreau 1963; Livingstone 1975, 1982), has demonstrated that this presumed stability was a fallacy (similar data for Asia and Southeast Asia is less available). In fact, although the temperatures in tropical lowlands remained 'tropical' during glacial periods (3-5°C lower than today), the forest broke into isolated remnants during cool dry periods (glacial phases). The remnants of forest expanded and coalesced during warm humid periods (interglacial phases). Conversely, nonforest vegetation expanded during glacial and retreated during interglacial phases (as at present). Data from geoscience, however, have been insufficient to indicate the precise areas of changing forests and nonforests and, in particular, the areas in which forests remained during arid phases, presumably serving as refugia for animal and plant populations. Neverless, in the Neotropical region, studies on the biogeographical patterns of scorpions (Lourenço 1986c, 1987) have indicated several endemic centres which are well correlated with the conclusions of Prance (1982b) on woody plants, and Haffer (1969) on birds.

3. Secular scale: ecological biogeography

The analysis of ecological factors responsible for explanation of the biogeographic patterns of scorpions have been biased on two major considerations:

(i) for many years there has been an almost total lack of knowledge of life history strategies; knowledge which, until the late 1980s, was almost the only preoccupation of ecologists,

(ii) a generalized opinion, even among modern biologists, according to which scorpions are capable of withstanding radical changes in environmental conditions, and therefore of being very good colonisers.

This assumption is a fallacy. With our growing knowledge of scorpion life history strategies we can see that many, if not most scorpions, are equilibrium species (Polis 1990), which tend to inhabit stable and predictable natural environments, produce single egg clutches, do not store sperm, have long life-spans, present low population densities, have a very low r_{max}, show weak mobility, and are highly endemic.

In contrast, however, some scorpions are 'opportunistic species'. These include certain species of the family Buthidae and a few of the families Euscorpiidae and Liochelidae. They are marked by ecological plasticity and are readily capable of invading disturbed environments. They may produce multiple clutches from a single insemination, have elaborate sperm storage capabilities (Kovoor et al. 1987), short embryonic development, short life spans, high population densities, rapid mobility, and are widely distributed. The study of these opportunistic species is of little use for establishing biogeographical patterns.

Opportunistic species evolve mainly in disturbed and unpredictable environments which are the result of natural causes such as volcanic activity or human action. Examples include a population of the neotropical species *Centruroides gracilis* (Latreille, 1804) in the Canary Islands (Kraepelin 1905; Lourenço 1991) and the worldwide distribution of the originally Sri-Lankan species *Isometrus maculatus* (DeGeer, 1778) which has been transported by human agency during the last four centuries and is today present in almost all tropical coastal regions (Huber et al. 2002). The replacement of species is well illustrated in several islands of Eastern Asia (and Wallacea) where natural volcanic activity and human impact are important (Vachon & Abe 1988). In this region, many endemic populations of equilibrium species are regressing or have disappeared. Some may be replaced by opportunistic species which will probably occupy most of the islands in the future (Vachon & Lourenço 1985).

In continental regions, opportunistic species can rapidly occupy habitats disturbed by human activities, where the original native species have been selected against, thus leaving their ecological niches vacant (Lourenço & Cloudsley-Thompson 1996). This kind of situation is yet rarely observed in Southeast Asia (and Wallacea), except maybe, for the expanding distribution of species such as *Isometrus maculatus* (DeGeer, 1778), *Lychas mucronatus* (Fabricius, 1798) and *Liocheles australasiae* (Fabricius, 1775).

Biogeographical patterns in Southeast Asia (and Wallacea)

Since it is not in the scope of this chapter to provide an exhaustive description of the geology of Southeast Asia (and Wallacea), only a synopsis is proposed of the excellent contributions by Moss & Wilson (1998), Turner et al. (2001) and Michaux (2010), including several references therein.

As stated by Turner et al. (2001), the biogeography of Southeast Asia and the West Pacific is complicated by the fact that these are regions on the border of two palaeocontinents that have been separated for a considerable period of time. Thus, two general patterns relating to dispersal can be found: a group of Southeast Asian elements, perhaps of Laurasian origin, expanding into Australian areas, and a reverse pattern for Australian elements, perhaps of Gondwanan origin. Besides, both Australian and Southeast Asian elements may occur in the Pacific. They dispersed there as the Pacific plate moved westward, bringing the different islands within reach of Southeast Asia and Australia.

The Malay Archipelago, also known as Malesia (Malaysia up to the Philippines and Papua New Guinea), also has a very complex geological history. Several larger islands are complexes of amalgamated microplates and almost all microplates originated from the Australian plate or Australian part of Gondwana. The western half of Malesia (up to Borneo and a part of Sulawesi) broke off first and was already well in place before the second wave of microplates started to move away from Australia. In the case of modern taxa of several groups the western half of Malesia is an extension of Southeast Asia. Taxa that are widespread and cross Wallace's line in the centre of Malesia, could only have obtained their distribution after dispersal for which, theoretically, various routes have been available. Several parts of the microplates emerged above water and could be used as 'stepping stones' during dispersal.

The collisions between several ocean plates (Pacific, Indian, Philippine) and land plates (Eurasian, Indian, Australian) have created an intricate geological history for Southeast Asia and the West Pacific islands (see Ridder-Numan 1996) and for the East Malay Archipelago and the West Pacific Islands (de Boer 1995; de Boer & Duffels 1996).

The West Malay Archipelago and part of Southeast Asia consists of fragments which broke off from Australia and which rifted northwards and collided with the Eurasian Plate. This process may already have started in the early Palaeozoic (circa 400 My) or up to the Late Devonian. Consequently, most of Southeast Asia was already in place before many recent plant and animal taxa evolved there. Thus the plants and animals present in West Malesia should be mainly of Southeast Asian origin. The history of the plants and animals may still reflect part of the geological history of this region as many microplates remained separate for a long time, or after collision had created barriers like mountain ranges. Moreover, large parts of Southeast Asia and West Malesia were submerged several times, not only during the more recent interglacial periods, but high sea levels were for instance also present during the Late Eocene (circa 40 My). India separated from Gondwanaland circa 195 My, and finally collided with Asia in the Late Eocene. India could have acted as a 'raft', carrying taxa from Africa to Asia, which could spread over Southeast Asia and West Malesia after collision. During its rift it came in close contact with still northward moving Sumatra, which means that an earlier exchange of floral and faunal elements could have taken place. Possibly, during the close contact between Sumatra and India, India became populated by Southeast Asian elements, still existing in the forests of Kerala and Sri Lanka. The East Malay Archipelago also consists of small fragments of Australian-New Guinean origin. These include East Sulawesi, the Moluccas and the Lesser Sunda Islands. With the arrival of these slivers and after their emergence from sea, several island arcs were formed between Southeast Asia and Australia. As stated by Turner et al. (2001), New Guinea has a very special history. 'The southern part (south of the central mountain ranges) has always been attached to Australia. The northern edge is an amalgamation of more than 30 terranes of various origins: island arcs, pieces of broken off Australian or New Guinean continent and even parts of trapped sea floor' (Turner et al. 2001).

As outlined by Turner et al. (2001), 'the regions of Southeast Asia and the West Pacific have long attracted the attention of biogeographers. In the 19th century Alfred Russel Wallace noted that the biota of the Malay archipelago consisted of Asian and Australian elements, with the former predominant in the western part, and the latter towards the east. His explanation was that the different groups of organisms had originated in Asia and Australia, and subsequently dispersed. Also, he assumed that these continents had at one time been larger, and became fragmented as a result of sea level fluctuations. Wallace (1860) drew a line demarcating where the Asian biota is separated from the Australian one, later called 'Wallace's Line'. Mayr (1944) used the name Wallacea for the region between Wallace's and Lydekker's lines. According to Michaux (2010), however, Wallacea as a whole cannot be considered as a natural biogeographical region, neither is it completely artificial as it is formed from a complex of predominantly Australian exotic fragments linked by geological processes within a complex collision zone.

According to some authors, Moss & Wilson (1998), Wallacea includes Sulawesi, the Moluccas and the Lesser Sunda Islands as well as an extensive area of shallow sea, and its eastern margin is taken as Lydekker's line; the western boundary of the strictly Australian fauna. Other authors (see Michaux 2010) argued that the Philippines may be an integral part of Wallacea.

The scorpions of Southeast Asia (and Wallacea)

As already outlined in several publications (Lourenço 2007, 2009a 2011a, b, c, 2012a, b; Lourenço & Duhem 2010a, b; Lourenço & Leguin 2012; Lourenço & Pham 2011, 2012; Lourenço & Zhu 2008; Lourenço et al. 2010a, b), the scorpion fauna of Southeast Asia (and Wallacea) has been poorly studied. Pioneer work has been conducted by many authors, but most of their publications represent isolated contributions, e.g. Gervais (1841, 1844), Oates (1888), Pocock (1891, 1894b), Simon (1877, 1878, 1893), Thorell (1888, 1889, 1890), Borelli (1904), Banks (1928), Fage (1933, 1936, 1946), Kopstein (1935, 1937) in which new taxa were described. Subsequently, a number of new contributions have revealed additional new species or interesting aspects about the elements of this fauna, such as the papers by Takashima (1942, 1945, 1948, 1950, 1952), Bristowe (1952), Francke (1976), Koch (1977), Couzijn (1981), Vachon & Lourenço (1985). More recently, other contributions have appeared Kovařík (2000, 2003, 2012) but are generally poorly documented and illustrated. Some, however, are much better documented and especially well illustrated than others, conveying a better understanding of the scorpions of Southeast Asia (e. g. Lourenço 2007, 2009a, b, 2011a, b, c, 2012a,b; Lourenço & Duhem 2010a, b; Lourenço & Leguin 2012; Lourenço & Pham 2010, 2012; Lourenço & Zhu 2008). Very recent studies have led to the description of new species of *Chaerilus* SImon, *Isometrus* Ehrenberg, *Lychas* C.L. Koch and naturally of pseudochactids from Cambodia, Laos, Vietnam but also from Indonesia and Papua New Guinea (Lourenço 2007, 2009a, b, 2011a, b, c, 2012a, b; Lourenço & Duhem 2010a, b; Lourenço & Leguin 2012; Lourenço & Pham 2010, 2012; Lourenço & Qi 2007; Lourenço & Zhu 2008; Lourenço & Ythier 2008; Lourenço et al. 2010, 2011).

Naturally, the most remarkable discoveries and descriptions of recent years were those of the elements of the enigmatic family Pseudochactidae Gromov, 1998, previously known only from Tajikistan and Uzbekistan (Lourenço 2007). Two new genera *Troglokhammouanus* Lourenço, 2007 and *Vietbocap* Lourenço & Pham, 2010 and four new species, *Troglokhammouanus steineri* Lourenço, 2007, *Vietbocap canhi* Lourenço, Pham, 2010, *V. thienduongensis* Lourenço, Pham, 2012 and *V. lao* Lourenço, 2012 from caves in Laos and Vietnam (Lourenço 2007, 2012; Lourenço & Pham 2010, 2012). The biogeographical impact of these discoveries in Southeast Asia will be the subject of future contributions (Lourenço, in preparation).

In this chapter, I propose only a synopsis of the major scorpion groups present in Southeast Asia (and Wallacea). Any resolution to the species level is not possible at this stage since many species remain dubious and require further investigation.

Family **Buthidae C.L. Koch, 1837**
Genus ***Isometrus* Ehrenberg, 1828** (Fig. 1, map 1)

The genus *Isometrus* with its two subgenera *Isometrus* Ehrenberg and *Reddyanus* Vachon is a typical Asian and Oceanic element with a rather widespread distribution in these regions. Within Southeast Asia and Wallacea it is distributed in Cambodia, Indonesia (Java, Sumatra, Borneo), Laos, Malaysia, Myanmar, New Guinea, Philippines, Singapore, Thailand and Vietnam. Outside this area it is also present in Australia, China, India, New Caledonia, Solomon Islands and Sri Lanka. One species, *Isometrus* (*Isometrus*) *maculatus* is the most widely distributed scorpion species in the world, and can be found in most tropical and subtropical coastal regions. Its distribution, however, has an anthropogenical background, probably going back to the great naval voyages of the 16th century. So it can only be considered as a secondary succession of an opportunistic element (Huber et al. 2002).

Elements found in Tertiary Baltic amber (circa 55 My) suggested closely connections between this palaeofauna and elements of the genus *Isometrus*. This can suggest that this genus presented in

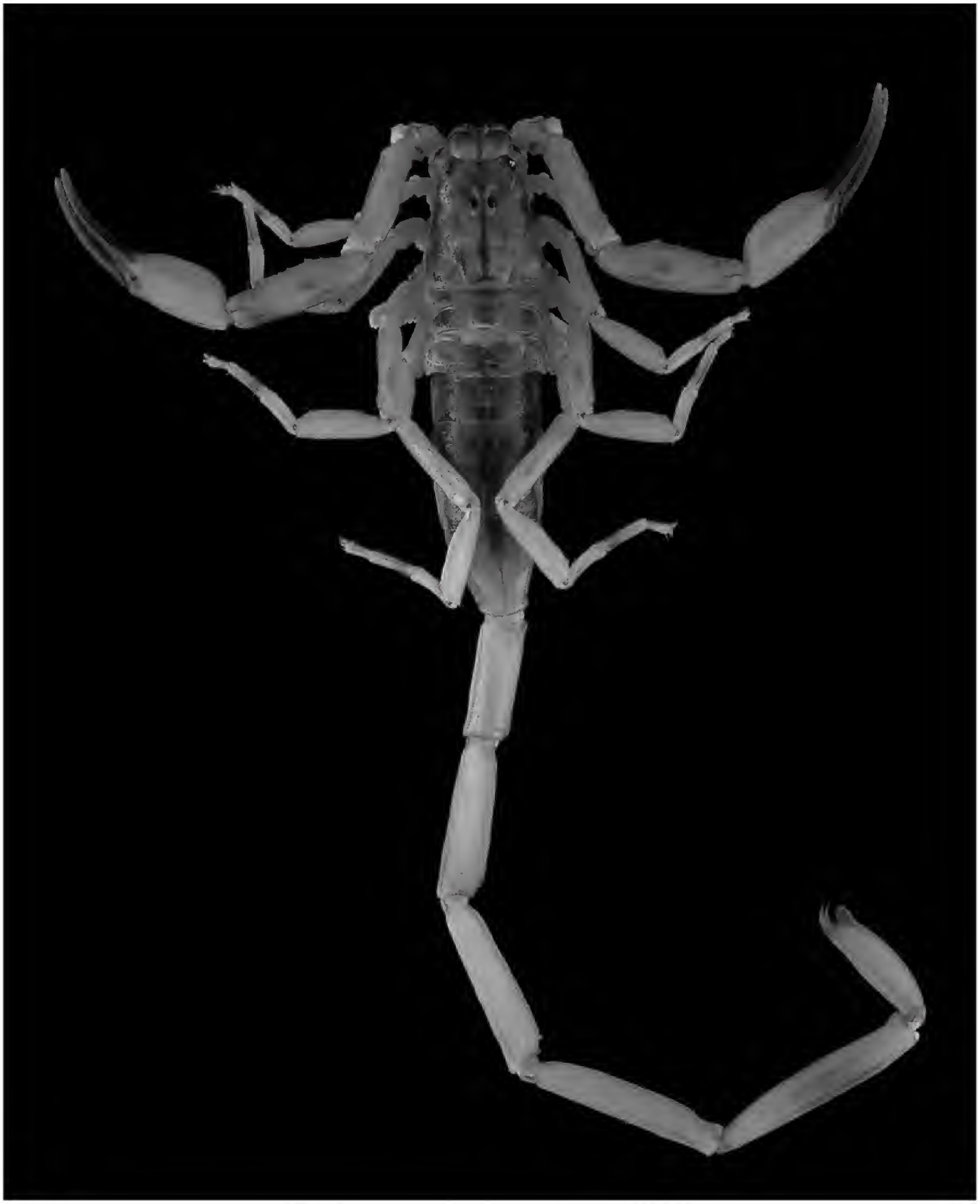

Figure 1. *Isometrus lao* Lourenço, Leguin, 2012. Male holotype from Laos.

palaeotimes a much wider distribution than the present one (Lourenço & Weitschat 2005; Lourenço 2009c).

Genus ***Lychas* C.L. Koch, 1845** (Fig. 2, map 1)

The genus *Lychas*, which clearly presents phylogenetic connexions with the genus *Isometrus*, shows a much larger distribution over Africa, Asia and Oceania. Within Southeast Asia (and Wallacea) it is distributed in Cambodia, Indonesia Islands, Laos, Malaysia, Myanmar, New Guinea, Philippines, Thailand and Vietnam. Outside this area it is also present in several countries in Africa: Angola, Congo, Democratic Republic of Congo, Ethiopia, Kenya, Malawi, Mozambique, Somalia, South Africa, Tanzania, Zambia, and Zimbabwe. In the Indian Ocean Islands it is present in Mauritius and Seychelles, but curiously absent from Madagascar.

Figure 2. *Lychas aberlenci* Lourenço, 2013. Male from Laos (photo: A. Teynié).

Its distribution in Asia and Oceania comprises Andaman Islands, China, India, Japan (introduced), Nepal, Sri Lanka, Australia, Fiji, Solomon Islands.

The genus *Lychas* C.L. Koch, clearly presents a Gondwanian pattern of distribution which was globally suggested for the elements of the '*Ananteris*-group' (Lourenço 2011d). This 'Group' includes also other genera such as *Ananteris* Thorell, 1891 in Tropical America, *Ananteroides* Borelli, 1911 and *Lychasioides* Vachon, 1974 in Africa, *Tityobuthus* Pocock, 1893 in Madagascar and *Himalayotityobuthus* Lourenço, 1997 in the Himalayas.

Other elements found in Tertiary Baltic amber (circa 55 My) equally suggested closely connections between this palaeofauna and elements of the genus *Lychas*. This can suggest that this genus presented in palaeotimes an even more wider distribution than the present one (Lourenço & Weitschat 1996; Lourenço 2009c, 2012d).

At least one species *Lychas mucronatus* (Fabricius, 1798) is very largely distributed in Asian tropical forests. Its distribution, however, seems to be limited to Asia, not reaching New Guinea or Australia. Records for Japan are associated to an anthropic introduction. This species shows characteristics of a polymorphic species, as already observed for other buthid elements. However, most of its range of distribution can be attributed to a natural process of dispersion. Although this species is common in rainforests, its process of distribution and differentiation is still poorly understood and will require further investigation.

A third buthid genus *Thaicharmus* Kovarik, 1995 was also recently described from Southeast Asia, Thailand. It remains, however, rare and imprecisely known.

Family **Chaerilidae Pocock, 1893**
Genus ***Chaerilus*** **Simon, 1877** (Fig. 3, map 2)

Chaerilids are at present a typical Asian group of scorpions with a large number of species in Southeast Asia (and Wallacea). As Lamoral (1980) already suggested the protoelements of

Figure 3. *Chaerilus telnovi* Lourenço, 2009. Male holotype from Halmahera.

the Chaeriloids most certainly evolved in Laurasia during Pangean times and only subsequently to the connection of India with the Asian continent their elements dispersed toward the south, to India, Southeeast Asia (and Wallacea).

Species are known from Cambodia, the Indonesian Islands: Borneo, Celebes (Sulawesi), Java, Sumatra (and more recently from Halmahera), Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. This family is also known from the Andaman Islands, Bangladesch, China, India, Nepal and Sri Lanka (Lourenço 2001a, 2012b).

A few and rare elements found in Cretaceous Burmese amber (circa 110-120 My) clearly suggested closely connections between the Cretaceous palaeofauna and extant species of the family Chaerilidae (Santiago-Blay et al. 2004).

Figure 4. *Euscorpiops alexandreanneorum* Lourenço, 2013. Male holotype from Laos (photo: A. Teynié).

This suggests that elements associated to the chaerilids were already presented in palaeotimes of continental Southeast Asia.

Family **Euscorpiidae Laurie, 1896** (Fig. 4, map 3)
Subfamily **Scorpiopinae Kraepelin, 1905**

The family Euscorpiidae has a very wide distribution from Southeast Asia through Middle East, Europe and North America (Lourenço 2013). This pattern of distribution clearly attests of a Laurasian origin. In Asia and Southeast Asia only the elements of the subfamily Scorpiopinae are represented by six genera: *Alloscorpiops* Vachon, 1980, *Dasyscorpiops* Vachon, 1974, *Euscorpiops* Vachon, 1980, *Neoscorpiops* Vachon, 1980, *Scorpiops* Peters, 1861 and *Parascorpiops* Banks, 1928. All excepted one, *Neoscorpiops* known only from India, are represented in Southeast Asia, but most are only distributed in the continent: Laos, Myanmar, Thailand and Vietnam. The only element present in Wallacea is *Parascorpiops* Banks represented by a single species from Borneo/ Sarawak. This subfamily is also distributed in Afghanistan, Bangladesh, Bhutan, China, India, Malaysia, Nepal and Pakistan. No fossil records are known (Lourenço 2013).

Family **Liochelidae Fet, Bechly, 2001**
Genus ***Liocheles*** **Sundevall, 1833** (Fig. 5, map 1)

The family Liochelidae presents a typical

Figure 5. *Liocheles australasiae* (Fabricius, 1775). Female from Vietnam (photo: E. Ythier).

Gondwanian pattern of distribution. In Southeast Asia (and Wallacea) it is represented by one genus *Liocheles* Sundevall. It can be suggested that the elements of the liochelids were already present in the emerged shields of Gondwanaland prior to the continental fragmentation that took place in the second half of the Cretaceous (Lourenço 1989).

In Southeast Asia and Wallacea *Liocheles* Sundevall species are distributed in Cambodia, Laos, Indonesian Islands, Malaysia, Myanmar, Papua New-Guinea, Philippines, Thailand and Vietnam. Besides this region, the group is also distributed in Bangladesh, China (this record needs further confirmation), India, Japan (south islands), Australia, South Pacific islands, New Caledonia, Solomon Islands and Vanuatu. Another genus, described from south of Vietnam, *Hormiops* Fage, 1933, remains dubius.

Only one fossil element associated to the Liochelidae family was described from the Early Cretaceous of Brazil, representing in fact a proto-element to the liochelids. This sedimentary fossil brought some further evidence to the Gondwanian pattern of distribution observed for this family. The discovery of *Protoischnurus axelrodorum* Carvalho, Lourenço, 2001 (Protoischnuridae), in the Araripe Basin, within the Mesozoic interior basin of Brazil, suggests the association of extant ischnurids (liochelids) with lineages at least 110-115 My-old. This finding corroborates the conclusion according to what liochelids lineages must have existed in the Cretaceous previous to the Gondwana break-up (Carvalho & Lourenço 2001).

Family **Pseudochactidae Gromov, 1998** (Fig. 6, map 4)

Genus ***Troglokhamouanus*** **Lourenço, 2007**

Genus ***Vietbocap*** **Lourenço, Pham, 2010**

Studies of the first species described for this family, *Pseudochactas ovchinnikovi* Gromov, 1998, insisted about the restricted distribution of this monotypic family to the mountains of Uzbekistan and Tajikistan (Lourenço 2007). It was also suggested that based on its ancestral position in scorpion phylogeny, the Pseudochactidae lineage probably evolved during the Permian/Triassic. It was also assumed, however, that it was impossible to speculate as to whether this lineage was localized or widespread since there are no fossils available and the family was represented by a

Figure 6. *Vietbocap thienduongensis* Lourenço, Pham, 2012. Male from Vietnam (photo: D.-S. Pham).

single monotypic genus. The Pseudochactidae, the most primitive extant group of scorpions, according to several authors, appears to have survived in such relict conditions (see Lourenço 2007).

The discoveries of two new genera and species of Pseudochactidae in a Laotian and Vietnamian cave systems re-opened the question about the palaeo-biogeographic origin of this lineage (Lourenço 2007, 2012; Lourenço & Pham 2010, 2012). The only possible land connection between Uzbekistan/Tajikistan and Laos/Vietnam is the old Asian core. Consequently, the present known geographic disjunction in members of this family reflects a much larger past geographic area of the lineage, and the hypothesis of a possible Pangaean origin (Permian to Triassic time), should to be reconsidered. A new species of the genus *Pseudochactas* Gromov, 1998 was recently described from Afghanistan (Soleglad et al. 2012).

Some recent, but very rare species found in Cretaceous Burmese amber (circa 110-120 My) possibly suggested that some elements of the Cretaceous palaeofauna could have some common relationships to the extant families Buthidae, Chaerilidae and Pseudochactidae (Lourenço & Beigel 2011; Lourenço, 2012c). This suggests that possible proto-elements associated to these three extant families may already have been present in palaeotimes of the continental Southeast Asia.

Figure 7. *Heterometrus laoticus* Couzijn, 1980. Female from Laos (photo: E. Ythier).

Family **Scorpionidae Latreille, 1802**

Genus ***Heterometrus* Ehrenberg, 1828** (Fig. 7, map 5)

Scorpions of the family Scorpionidae, are represented by species of large size, rather common in Southeast Asia (and Wallacea). These scorpions represent also the most recently evolved scorpions in this region. Species are distributed in Cambodia, China (south), Indonesian Islands, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. The group is also present in Brunei, China (Tibet), India, Nepal and Sri Lanka.

No fossil records are known for this group of scorpions.

Possible Origins and affinities of the Southeast Asia (and Wallacea) scorpion fauna

Attempts to explain the origins and affinities of the scorpion fauna of Southeast Asia and in particular of Indonesian Islands and Wallacea, are not recent. Vachon (1953) during a symposium organized by the Biogeography Society in Paris proposed already a number of theories to explain the distribution of the scorpions in this region, in particular in connexion to Wallace's line. More recently Couzijn (1981) also suggested a number of theories to explain the present, and possible past distribution of the genus *Heterometrus* Ehrenberg. Naturally, many if not most of these preliminary theories could be biased by a lack of a precise taxonomic knowledge of the groups distributed in the region.

In view of the tables already present in the previous sections, it seems reasonable to suggest that the patterns of distributions of some scorpion groups present in Southeast Asia (and Wallacea), may have a direct connection with panbiogeography models. These suggestions can be applied to the buthid genera *Lychas* C.L. Koch and in part *Isometrus* Ehrenberg, the liochelid genus *Liocheles* Sundevall, most of the Asian genera of Euscorpiid and to all chaerilid and pseudochactid elements. The situations of the the genus *Heterometrus* Ehrenberg is less evident, mainly by a total absence of known fossils.

Obviously the panbiogeography patterns are directly related to the progressive fragmentation and continental drift of Pangea and Gondwanaland, but this model is responsible only of the original emplacement of proto-elements of the groups observed today. Subsequently, other events took also place, in particular connected with active or passive dispersal processes. For instance, the process of colonization of the different Indonesian islands by several scorpion elements are most certainly associated with the events that reduced the isolation of the islands as a consequence of the lowered sea levels during the extensive glaciations of the Pleistocene or previous periods. Sea levels were lowered 100 to 150 m (Donn et al. 1962; Gascoyne et al. 1979; Cronin et al. 1981; Mani 1974) exposing a series of 'stepping stone' islands from continental Southeast Asia up the nearby islands but also from island to island. The distance between the continent and the islands, and in particular between the islands was reduced in an important way.

Very recent natural or anthropogenic events are also responsible for some observed patterns of distribution. This includes important volcanic activities such the event of the Krakatau which took place in the end of the 19th century. Today a new scorpion fauna can be observed as the result of secondary succession (Vachon & Abe 1988). As already explained in the previous sections, the dispersion of some species by anthropogenic vehicles must to be retained. Species such as *Isometrus maculatus* (DeGeer, 1778), *Lychas mucronatus* (Fabricius, 1798) and *Liocheles australasiae* (Fabricius, 1775), most certainly have been transported by human agency during the last centuries, and still are today. Consequently these species are distributed in many tropical coastal regions of Asia, Oceania and Indian islands, as attested by the recently discovery of *L. australasiae* in the island of Reunion (Lourenço, unpublished data). In this volcanic island, native scorpion species are originally absent (Lourenço, unpublished data).

Conclusions

Although a reduced number of opportunistic scorpion species may not be good indicators for predictable biogeographic patterns, many or most scorpions are equilibrium species and can be useful models in biogeographical research. Several factors make scorpions useful for biogeographical (or biodiversity) studies, as suggested by Noss (1990):

(i) stabilized taxonomy, at least for some regions of the world;

(ii) life history strategies that are well understood;

(iii) the fact that individuals can readily be observed in the field with the use of UV light, and

(iv) biogeographical and endemic patterns that are well correlated with those of other taxa of animals and plants (see Lourenço 1987).

Scorpion biogeographers, however, need to be more aware, in their interpretations, of the distinction between the historical and the ecological factors responsible for the biogeographical patterns observed.

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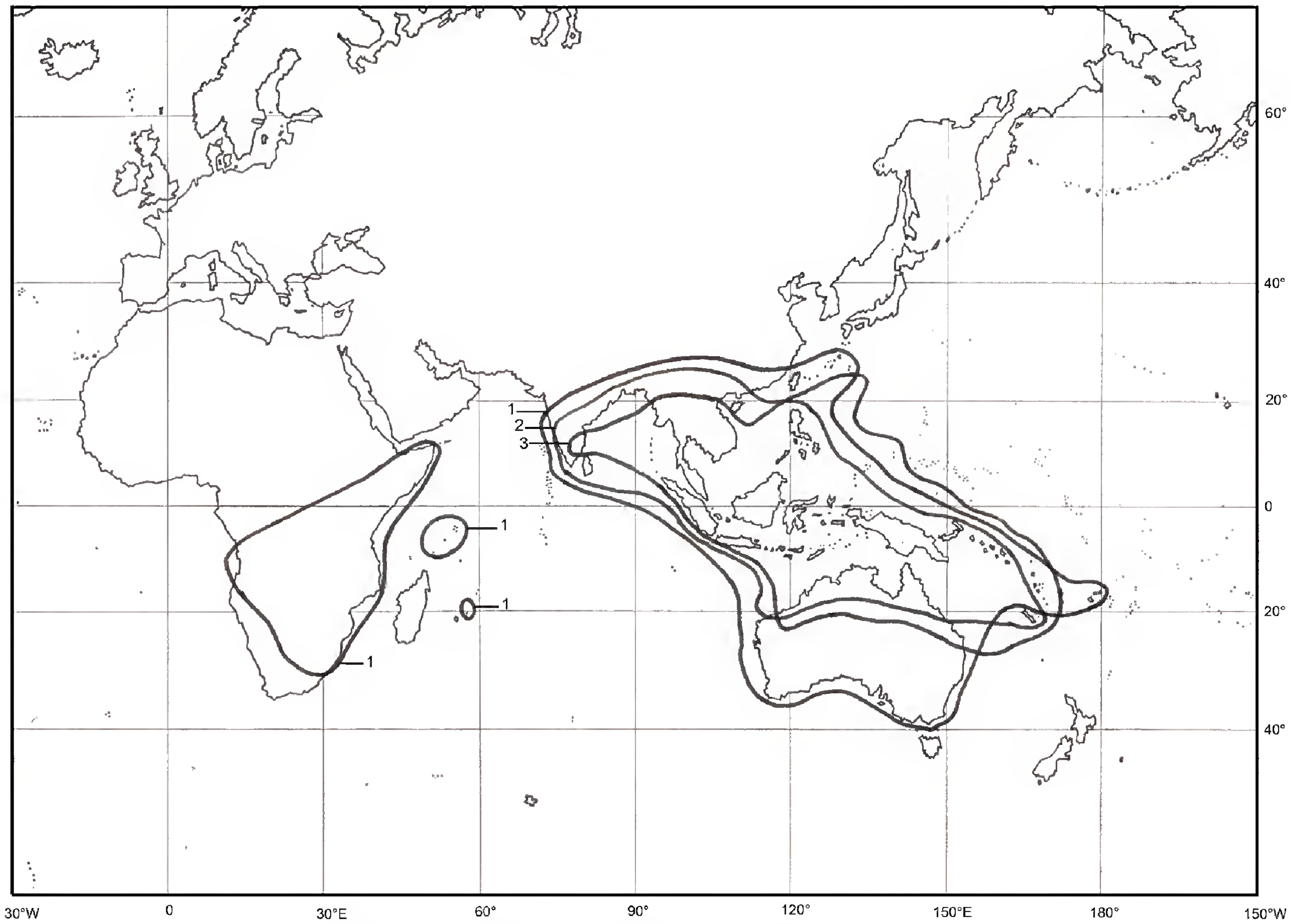
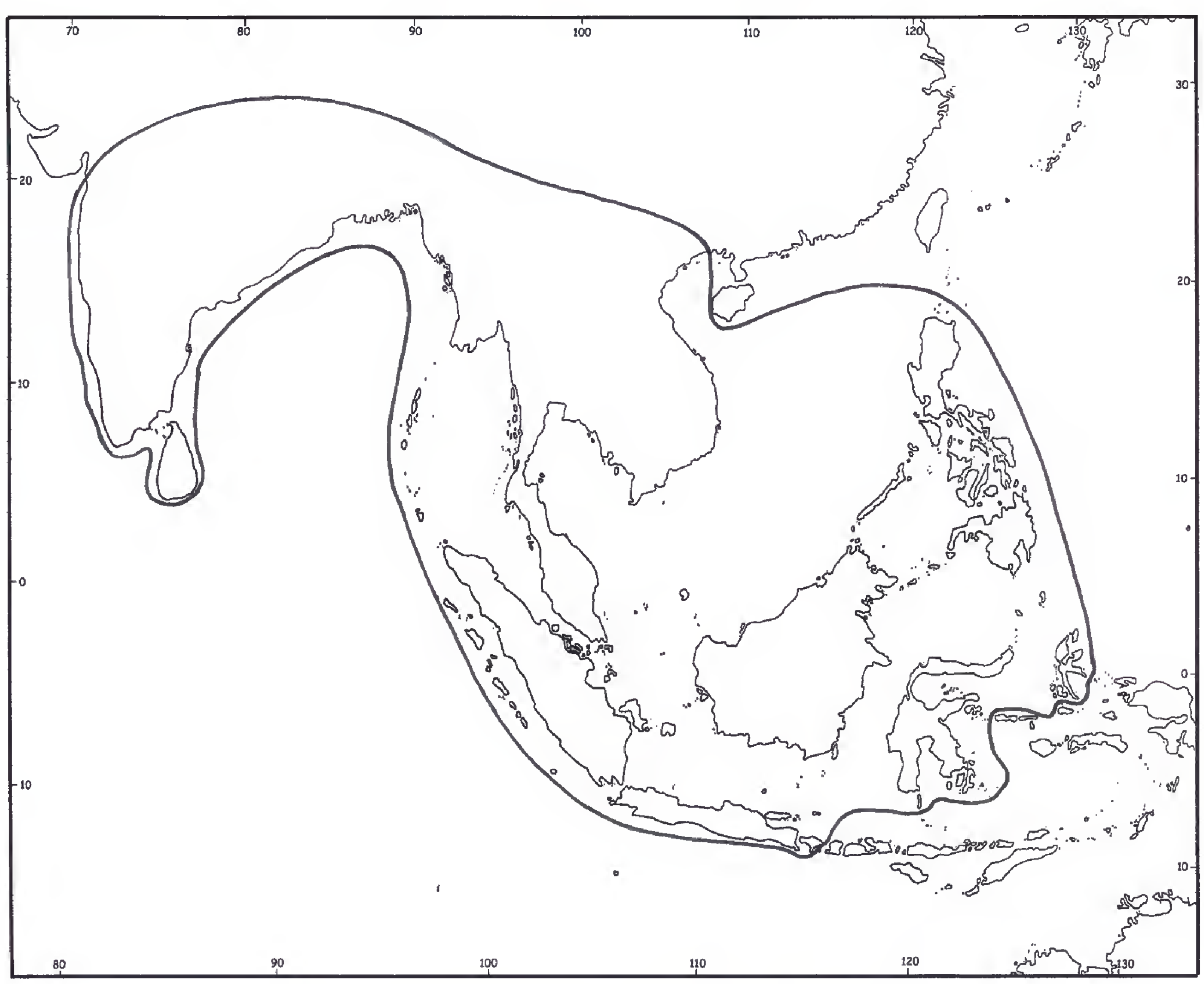
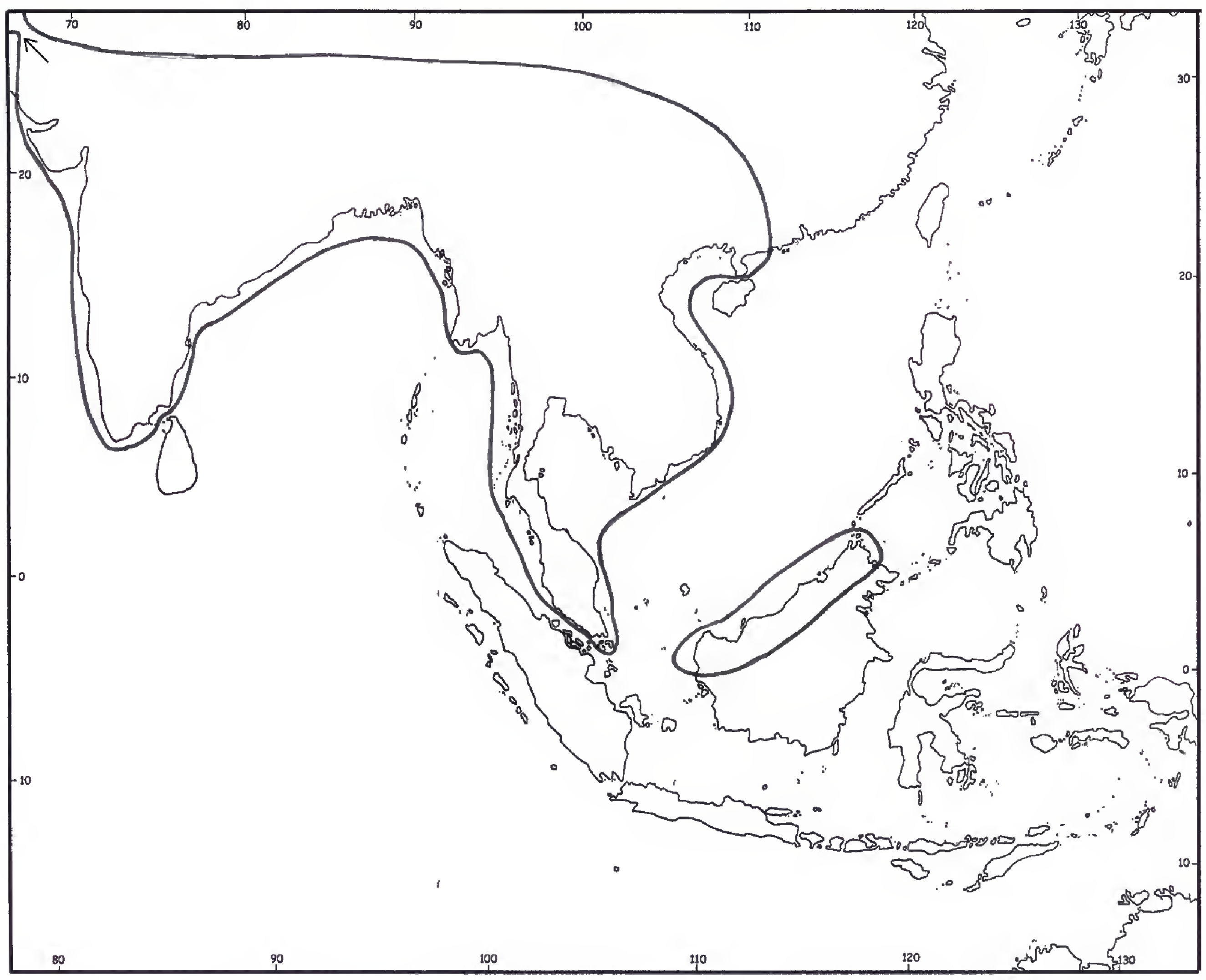


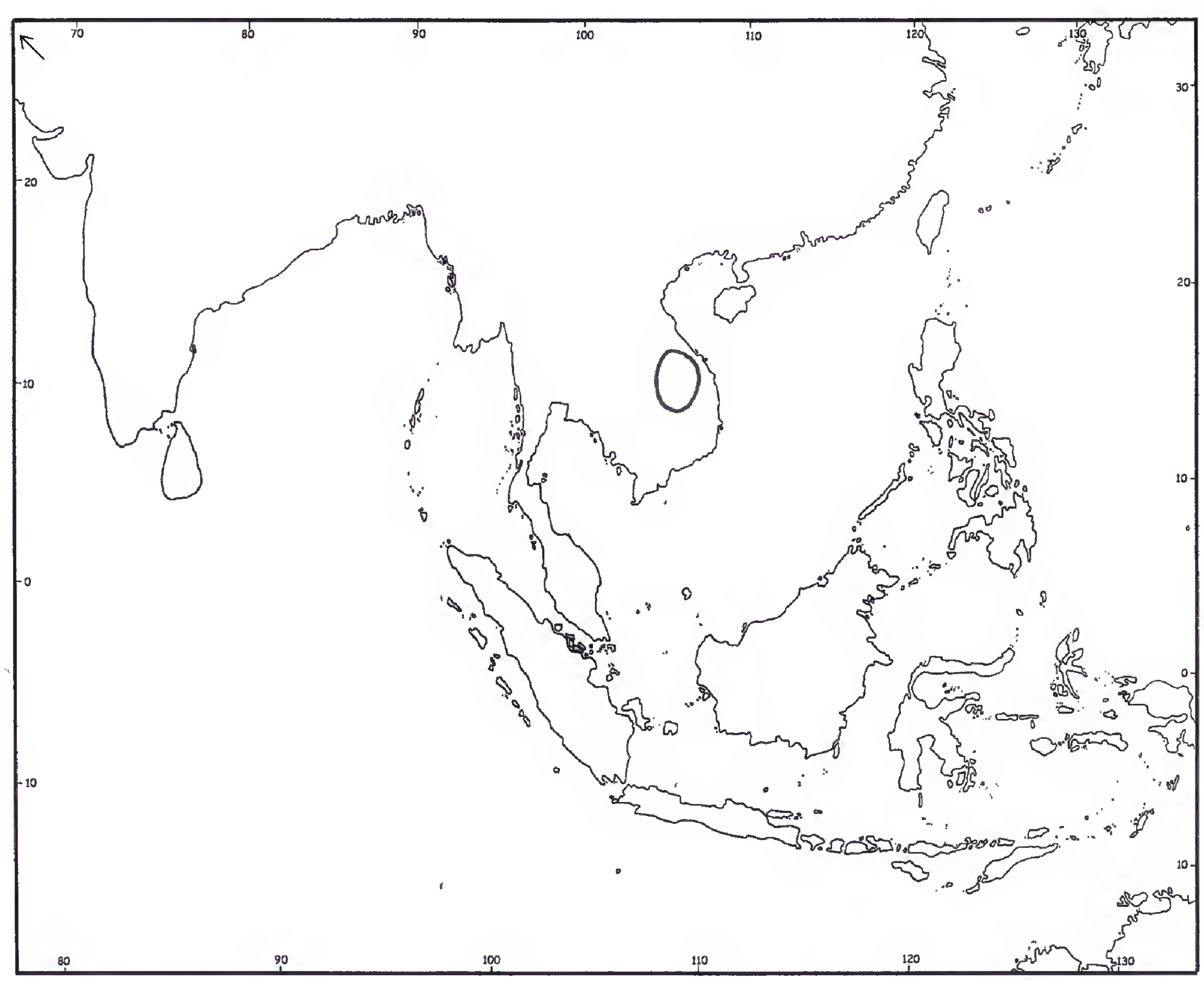
Map 1. Distribution area of genera *Lychas* C.L. Koch, 1845 (1), *Isometrus* Ehrenberg, 1828 (2) and *Liocheles* Sundevall, 1833 (3).



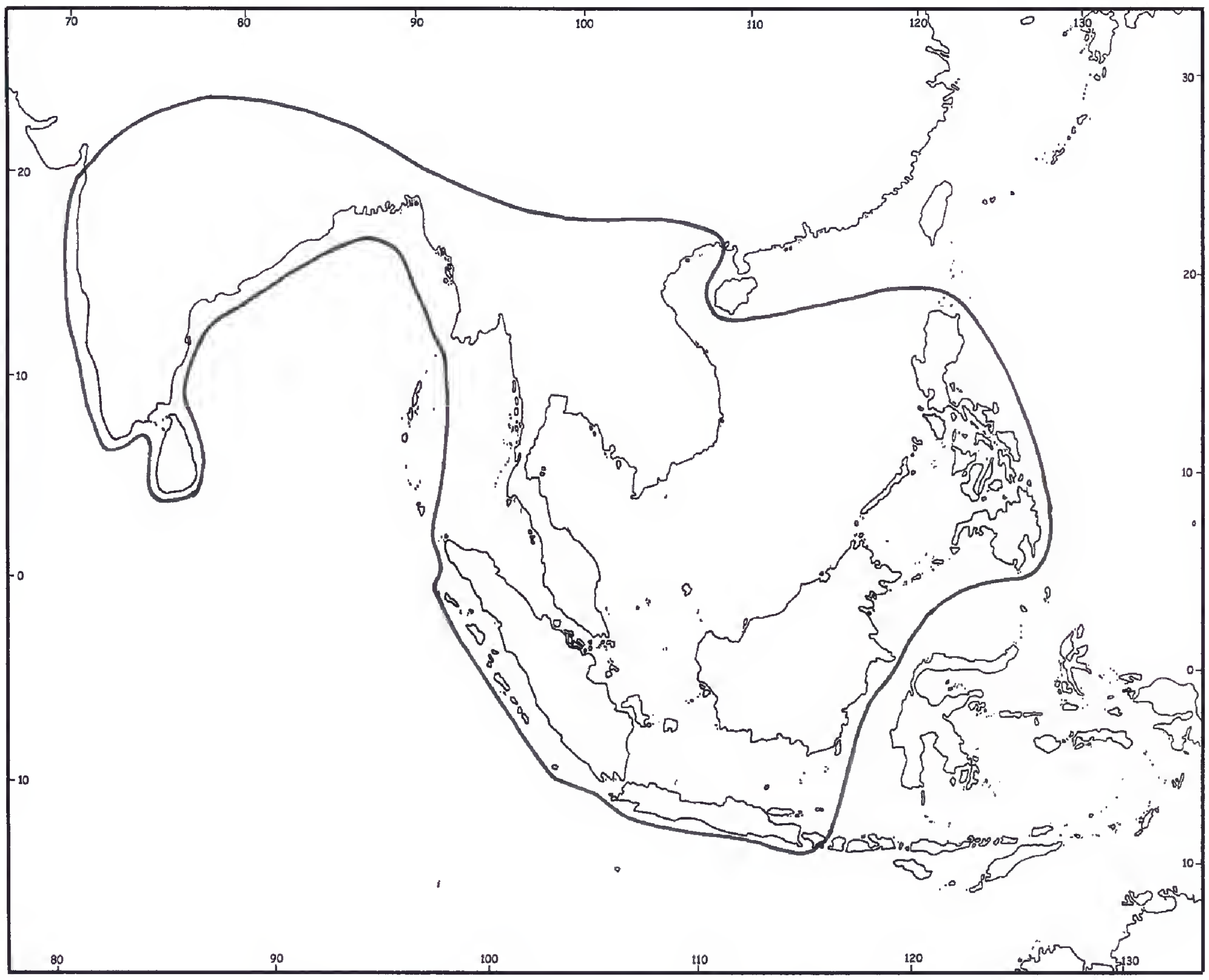
Map 2. Distribution area of the genus *Chaerilus* Simon, 1877.



Map 3. Distribution area of subfamily Scorpiopinae. Arrow indicates that the family is also distributed westwards.



Map 4. Distribution area of family Pseudochactidae in Southeast Asia. Arrow indicates that the family is also distributed westwards.



Map 5. Distribution area of genus *Heterometrus* Ehrenberg, 1828.

Biogeography of Luzon Island, Philippines

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Abstract: Luzon Island is the largest and oldest of the oceanic islands of the Philippine archipelago. Previous biogeographic research has determined centres of endemism within the island. While the Pleistocene Aggregated Island Complex theory defines the island as one biogeographic region, recent phylogenetic studies suggest that the island may be composed by distinct centres of endemism that correlate with tectonic features. Deep genetic divergence between northern Luzon and southern Luzon clades support this hypothesis. Past researches have downplayed the importance of vicariance in the modern biogeography of the island. However post vicariance dispersal may have obscured historical and area relationships that are noted in coalesced islands. Nonetheless, the molecular phylogenetic signature of pre Pleistocene vicariant events are there and further phylogenetic studies may clarify these relationships.

Key words: Pleistocene Aggregated Island Complex (PAIC), vicariance, dispersal, Luzon, Philippines, biogeography.

Introduction

This essay builds upon the biogeographical hypotheses on the Philippines position in Wallacea in Volume 1 of this book series. In my “The Philippines in Wallacea” I propose looking at the biogeography of the Philippines beyond the Pleistocene Aggregation Island Coalescence (PAIC) theory (Vallejo 2011). Here I focus on Luzon, the oldest of the oceanic Philippine islands. Luzon is the largest (104 688 km^2) island of the Philippine archipelago. The roughly rectangular island is orientated with its longest axis north to south from 18°32’N to 12°31’N (Fig. 1). The shape of the island gives rise to its name. The island resembles the traditional rice pestle or “lusong” of the Austronesian people.

The southern and south-eastern portion of the island is composed of a series of peninsulas trending southeast for about 150 km (Fig. 2). The northern end of the island are composed of several mountain blocs, most notable of which is the Cordillera Central whose mountains attain an altitude of more than 2000 meters. A large central plain defines the central portion of the island. This is bordered on the west by the Zambales mountain ranges. The eastern side of the island is defined by the Sierra Madre mountain range that trends from north to south. At its northern end, a large valley, the Cagayan Valley is situated between the Sierra Madre to the east and the Cordillera Central to the west.

The latitudinal extent of Luzon and the complexity of its topography and the presence of intermontane valleys of varying sizes ensure a diversity of climate not observed anywhere else in the Philippine archipelago (Dickerson et al. 1928). The altitude of the landforms and their exposure to the prevailing monsoon and trade winds generally defines the climate of the island.

Tectonics of Luzon Island

The complex topography has tectonic origins. The island is hypothesized as a product of the accretion of at least four paleoislands (Hall 1996, 1998). The paleoislands correspond to the five montane regions of Luzon (Devan-Song et al. 2012). The island is part of the Philippine Mobile Belt (PMB) that defines the seismically active part of the archipelago (Gervasio 1967). The island being part of the PMB is bounded by two subduction zones of opposite polarities. The eastern side is bounded by the west dipping Philippine Trench and the western side is by the east dipping Manila Trench. New geophysical evidence suggests that the Benham Rise oceanic plateau east of Luzon has a thicker crust than what can be expected for oceanic crust (Lagmay et al. 2009). This feature began colliding with northern Luzon starting in the Miocene thereby profoundly affecting Luzon’s tectonic evolution.

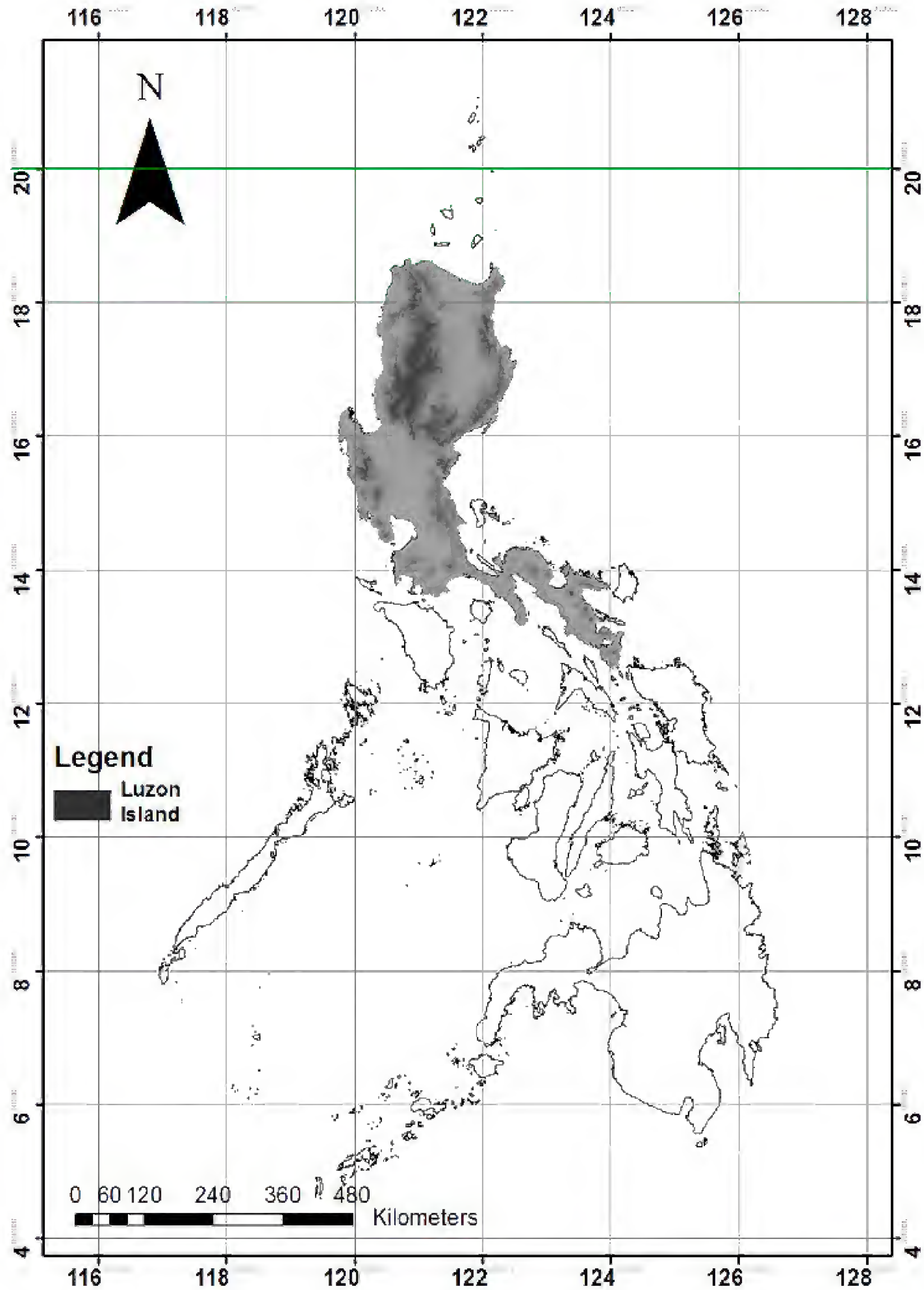

Figure 1. Luzon Island in the Philippine archipelago.

The Philippine archipelago and most especially Luzon Island is defined by the left lateral strike slip Philippine fault system which longitudinally cuts Luzon Island (Yumul et al. 2008) at Quezon and Nueva Ecija provinces. It originates from Davao Gulf in Mindanao, bisects Mindanao's Agusan basin, the passes through Leyte and Samar islands before terminating in Luzon's north-western coast. In Luzon the fault becomes braided (Fig. 3).

Thus with new geophysical data it is now possible to delineate the tectonic blocks that comprise Luzon. These blocks are mobile, elastic and are related to the major fault features in Luzon that absorb plate convergence such as the Philippine Fault, Digdig Fault and the Northern Cordillera Fault. From a biogeographic standpoint, blocks may correlate with patterns of endemism and distribution of Philippine biota. This is the hypothesis first proposed by Roy Dickerson and Elmer D Merrill in 1928 (Dickerson et al. 1928).

Dickerson's hypothesis

Roy Dickerson and associates of the Philippine Bureau of Science in "Distribution of Life in the

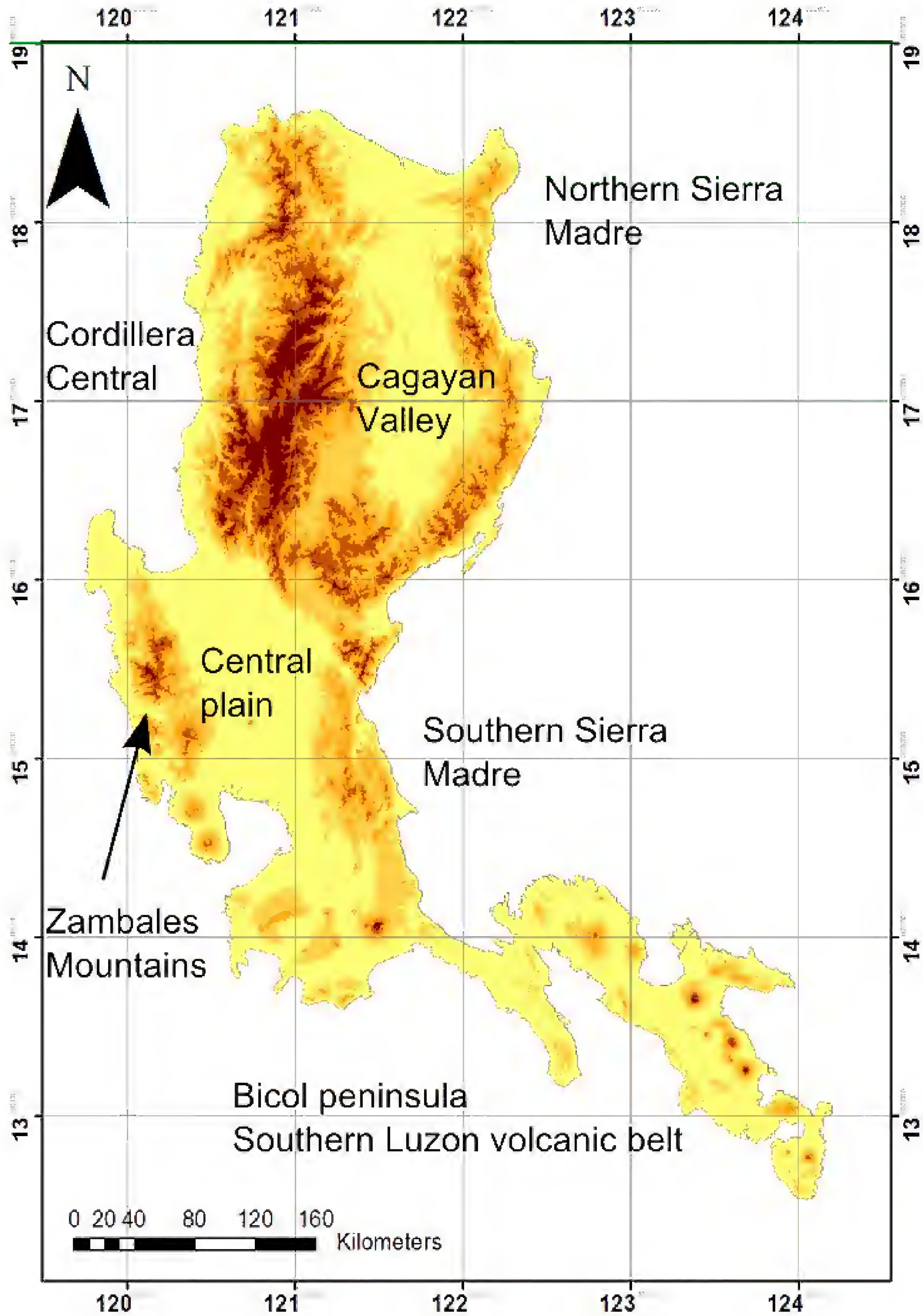

Figure 2. Major physical geographic features of Luzon Island.

Philippines" (1928) proposed that the geological features of the Philippine islands could partly explain the reason for the localization and endemism of the Philippine biota. Dickerson's hypothesis is based on the fifth axiom of biogeography (Wallace 1880) its emphasis on a general knowledge of geological history is necessary for understanding the evolution of the Philippine biota.

Dickerson interpreted the distribution of floral and faunal elements in the Philippines using the dispersalist paradigm. He proposed four colonization routes by which dispersal happened. These are the Palawan-Mindoro route, the Borneo-Sulu route, the Sulawesi - Eastern Mindanao route and the Taiwan – Batanes - Northern Luzon route.

Luzon's biota provides support and difficulties for the dispersal hypothesis. Dickerson needed to explain the presence of the northern Luzon upland flora and fauna for which he had difficulties. While the phenomenon of continental drift had been hypothesized by Alfred Wegener in 1924 (Wegener 1966), the process by which this would happen had not been proposed. Without the explanatory power of plate tectonic theory, Dickerson had only the land bridge paradigm and the Wallace theory correlating emergence of islands with geological and

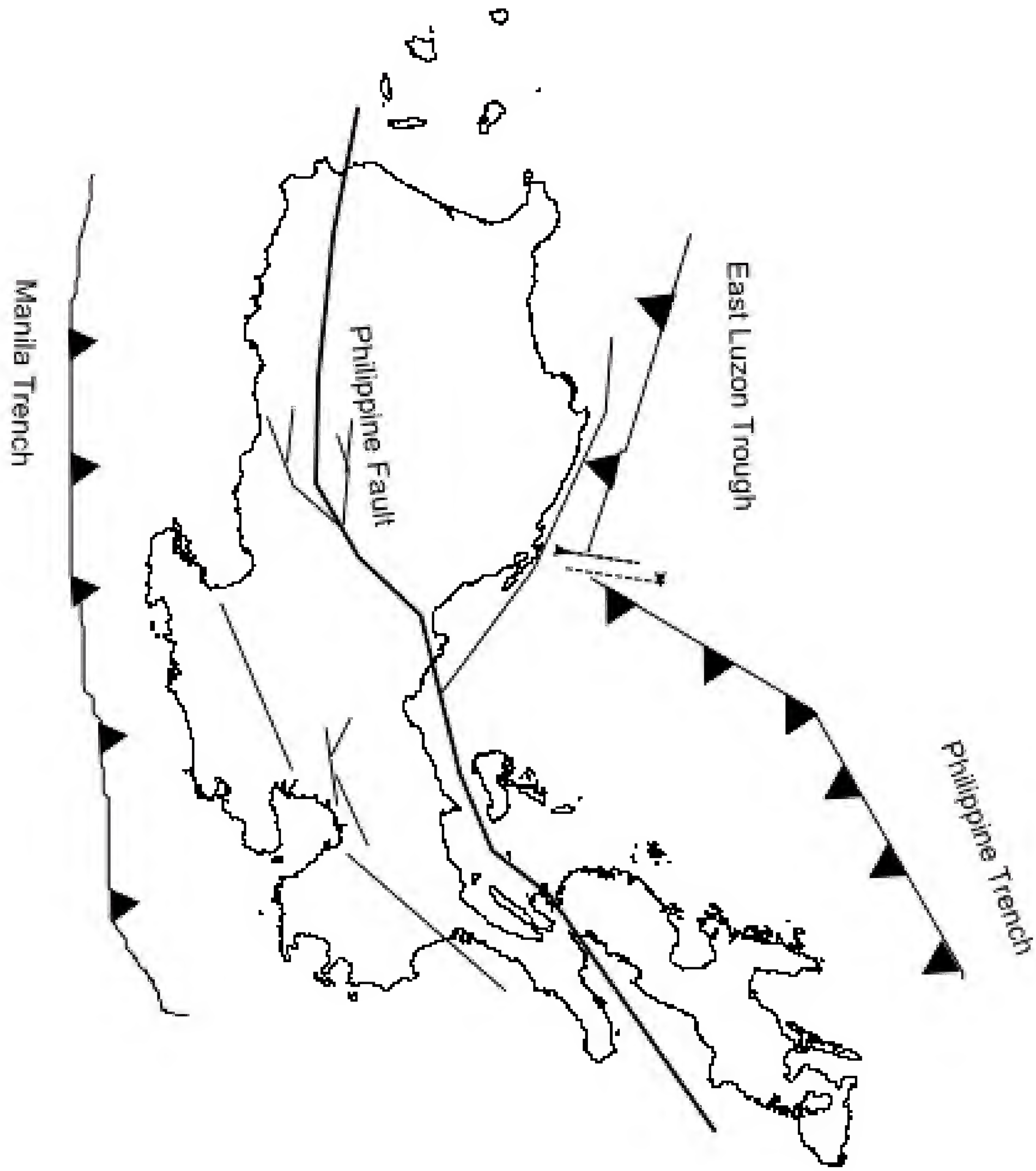

Figure 3. Major tectonic features of Luzon Island (modified from the Philippine Institute of Volcanology and Seismology, 2013).

consequently phylogenetic age of the biota.

The lack of a comprehensive theory to relate the presence of Philippine floristic provinces (sensu Merrill) with tectonic features did not prevent Dickerson to hypothesize on the physiognomy of geographical features of the Philippine islands in geologic time. This radical speculation such as the possibility that Luzon and Mindanao were once separate archipelagic systems which he inferred from the distribution of the modern biota within each island, presaged the idea of island coalescence (Hall 1996, 1998) now known as the Pleistocene Aggregated Island Complex (PAIC) theory which forms the basis of the current idea explaining the presence of distinct island biotic regions in the Philippines (Heaney 1986, 1998, 1999, 2000).

Biotic alliances in the Philippines and the distinctiveness of Luzon (Fig. 4)

Elmer D. Merrill (Merill 1923) observed that

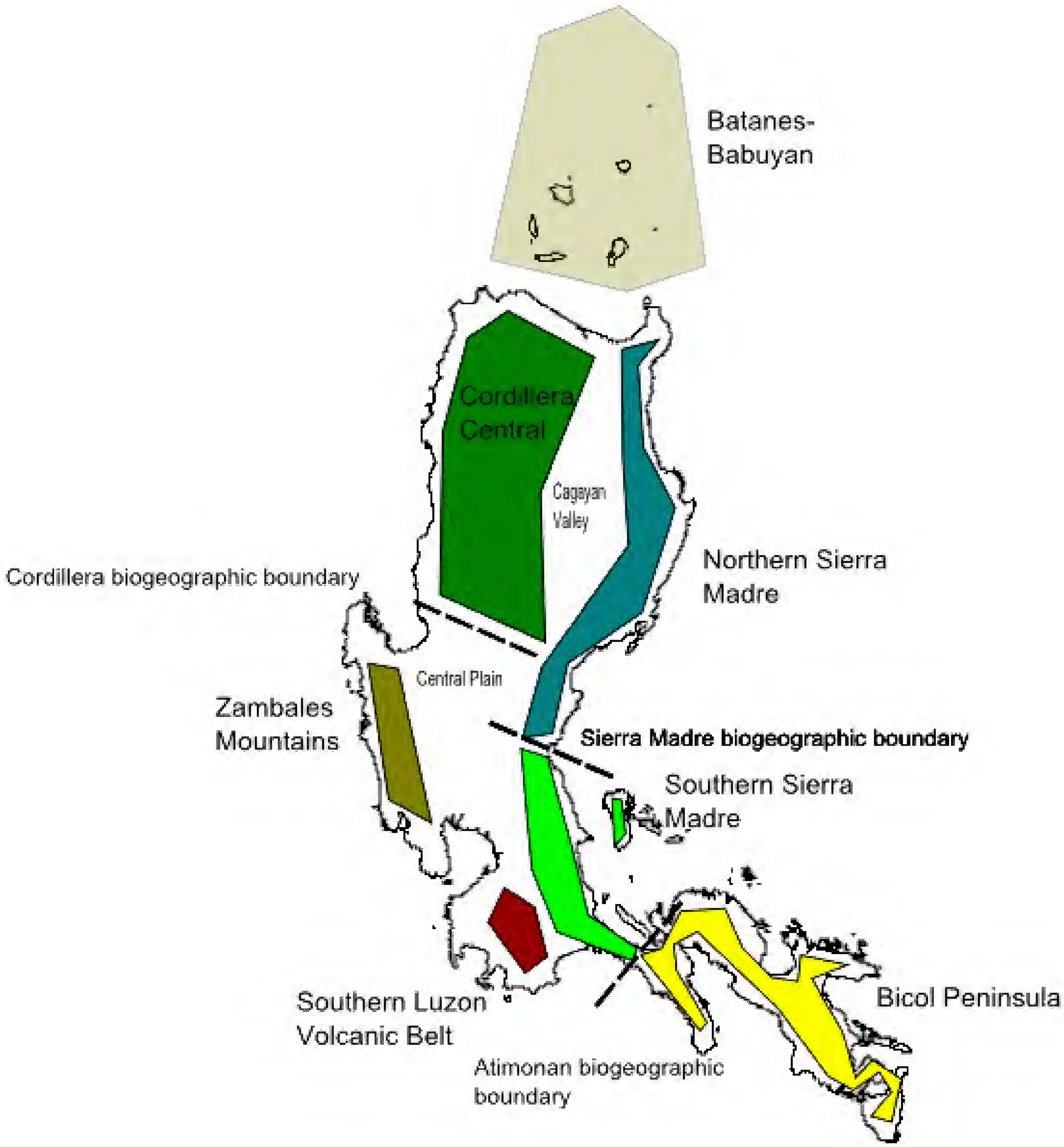

Figure 4. Luzon biotic regions (after Merrill 1928, modified with new distribution and tectonics information).

when the Philippines is taken as a whole, its floral affinity with other regions in Southeast Asia is definitely Indo-Malayan with a high proportion of endemic species. While floral regions do exist, its distinctiveness is not sharp with the exception of the Luzon Cordillera flora. It is on Luzon in the Cordillera where a flora and fauna with obvious Himalayan affinities are found. On other islands, it is on high mountains where a distinct Sulawesian and Australian affinity can be found. The Cordillera flora with the exception of a few species is localized in the region. Merrill hypothesized a connection with Taiwan but came to conclude that out of the 1100 species found in Taiwan and could occur in the Cordillera given that the climate conditions are similar less than 265 occur on Luzon and in Taiwan. Thus puts a question on the land bridge connection of Luzon with Taiwan, which tectonic studies later would conclude as unlikely. Merrill in conformity with the land bridge paradigm suggests that only the Cordilleras were once connected with Taiwan and the rest of mainland Asia.

A dispersal process cannot be ruled out for a colonization route from Taiwan. Recent studies suggest that at least for one species of skink, there is evidence of dispersal from Taiwan (Esselstyn et al. 2010).

Microendemism and mountain regions in Luzon

Luzon has a high degree of microendemism across taxa which has been extensively studied for the herpetofauna (Siler et al. 2010, 2011, Devan-Song et al. 2012) and mammals (Heaney et al. 1998, Rickart et al. 2011). This microendemism is found mainly in the montane regions. For the herpetofauna, four to five regions with significant microendemism can be recognized. For the mammals, four regions of microendemism are recognized. These regions are:

1) The Zambales Mountains,
2) Cordillera Central Mountains,
3) Northern Sierra Madre Mountains, and
4) The Southern Sierra Madre Mountains and the Southern Luzon and Bicol volcanic belt.

Mt Pulag which lies in the Cordillera Central is a convergence zone of endemic flora with Gondwanan and Eurasian affinities (Buot Jr. et al. 1999).

Of all the four regions of microendemism, the Zambales and Cordillera mountains have received more research interest in the last 20 years. Zambales is relatively isolated from the rest of Luzon's mountains by the central Luzon plain (Brown et al. 1996). This mountain range is essentially an ophiolite complex (Yumul et al. 2003, 2008). Recent research indicates that the Zambales mountains as well as the nearby Cordilleras have substantial patterns of endemism in small mammals (Balete et al. 2009, Rickart et al. 2011). The Zambales mountains have been also identified as an endemic plant region (Merill 1923; Dickerson et al. 1928). For example the umbrella plant genus *Schefflera* J.R. Forst, G. Forst, 1775 has many endemics in the Zambales and Cordillera Central ranges (Frodin 1986) but none outside these areas.

Can Luzon be a case by which biological disjunctions can be examined as related to tectonic features?

The presence of one major fault system in the Philippine archipelago gives an opportunity for biogeographers to examine whether biological disjunctions observed in Luzon and the four microendemic regions are congruent with tectonic features. In New Caledonia, Michael Heads in describes biodiversity with respect to the West Caledonian fault system by using molecular phylogenetic, tectonic and panbiogeographic methods to describe biotic disjunction with the fault system (Heads 2008). New Caledonia is an ancient remnant of Gondwana and is rich in archaic taxa. Heads hypothesizes that lateral strike slip fault systems may reveal more than biotic disjunctions that any other geological feature. In other island systems in the Pacific basin, such disjunctions have been also noted (Heads 1990, 2001, 2008) in studies in cladogenesis.

Two major schools of thought in biogeography examine the problem of disjunction and cladogenesis with respect to determining areas of endemism. In cladistic biogeography (Platnick et al. 1978, Nelson et al. 1981) especially in the parsimony analysis of endemism (PAE) approach, it is possible to come up with correct inferences to historical relationships among areas when by modelling a particular combination of vicariance and non-response to vicariance events (Brooks et al. 2003). In these cases, vicariance is wholly responsible for species distribution and species in each clade considered have a specific pattern of non-response to vicariance. These non-responses to vicariance generates the correct area relationships. Another model that generates correct historical and area inferences is when species distributions result from a particular combination of extinction events especially for wide ranging species. Extinction events may split ranges analogous to geological vicariance events. Brooks et al describe three cases when PAE methods fail. In the third case, post vicariance dispersal may obscure historical and area relationships. I hypothesise that the third case is likely for the Philippine archipelago.

Cladogenesis in Luzon

The general distribution of endemics in Luzon can be roughly characterized by a northern group and a southern group. The northern group clades consists of Zambales and Cordillera representatives and the southern group clades which includes species from the Bicol peninsula, have more affinity to representatives from the Visayas and Mindanao islands. In the fantail birds *Rhipidura* Vigors, Horsfield, 1827 (Sánchez-González et al. 2011), the older northern and southern clades have a deep divergence suggesting an earlier colonization from mainland Asia (Fig. 5).

A similar hypothesis can be proposed for the murines of Luzon (Jansa et al. 2006). The "old endemics" which include *Crateromys* Thomas, 1895, *Phloeomys* Waterhouse, 1839 cloud rats, *Batomys* Thomas, 1895 and *Carpomys* Thomas, 1895 show a deep divergence within the group, with the northern Luzon species more basal than the southern representatives. The Luzon endemic *Phloeomys* Waterhouse cloud rat genus is represented by a northern Luzon and a southern Luzon species and is more basal than *Crateromys* Thomas. *Crateromys* shows similar distributions in its representatives although this genus has representatives in Mindoro, Panay and Dinagat Islands. The "old endemics" colonized evolved at least 22 My, when northern Luzon's older tectonic features emerged from the ocean. There is evidence that the "old endemics" have affinities to Australasian murine clades (Steppan et al. 2003) but are now extinct in the rest of Asia (Jansa et al. 2006). More recent phylogenetic data from seven newly identified species of *Apomys* Mearns, 1905 reinforce the hypothesis that northern Luzon has a distinct and endemic biota (Heaney et al. 2011) and that central Luzon is a biogeographic break.

In the biogeography of the Philippine varanids, the northern and southern Luzon disjunction can be noted (Welton et al. 2010). The northern Luzon endemic *Varanus bitatawa* Welton, Siler, Bennett, Diesmos, Duya, Dugay, Rico, Van Weerd, Brown, 2010 is morphologically distinct from the southern Luzon and Bicol peninsular endemic *V. olivaceus* Hallowell, 1856. Both species are frugivorous. In total there are three frugivorous species of *Varanus* Merrem, 1820 in the world which includes *V. mabitang* Gaulke, Curio, 2001 from northern Panay (Gaulke et al. 2001).

These frugivorous varanids are associated with old growth rainforests which exists along the eastern Philippines bioregion. *V. bitatawa* and *V. olivaceus* are sister species, albeit with deep genetic divergence and their ranges are separated by the lower elevations of the southern Sierra Madre ranges (Fig. 6). The southern Sierra Madre is the eastern Luzon terminus of the active Philippine Fault (Yumul et al. 2008). While the southern Sierra Madre ranges which are very near to Manila have been historically deforested, they were unlikely to have been prior to human settlement. Thus it would have been possible for limited dispersal of the northern species to southern Luzon. Similarly the southern species could have dispersed to Luzon. However both species have evolved in higher montane forests and have unlikely to have dispersed through the lowland forests of the southern Sierra Madre. Nonetheless the distribution of endemic varanids of Luzon and even of Panay in the Visayas appear to be delimited by their tectonic features with *V. mabitang* localized in the Panay Cordilleras (Zamoras et al. 2008).

This distributional pattern is reflected in Philippine *Rafflesia* R. Brown (Barcelona et al. 2009) where *R. manillana* Teschem is localized to the Southern Luzon and Bicol Peninsula areas although some individuals were collected in Cagayan, northern Luzon. Luzon endemics of *Rafflesia* R. Brown have been collected in the Bicol peninsula and in the northern Sierra Madre ranges in Cagayan (Barcelona et al. 2006, 2009; Madulid et al. 2006). Panay also has its own endemic *Rafflesia* found in the Panay Cordilleras (Barcelona et al. 2002).

Revisiting PAIC theory

The Pleistocene Aggregated Island Complex (PAIC) theory (Brown et al. 2002) is the paradigm for explaining the origin and dimensions of biodiversity in the Philippines (Heaney 1986; Heaney 1998). The theory states that isolation and reconnection of islands that composed the palaeo "Greater Islands" of the Philippine archipelago provided the vicariant mechanism for speciation. Also differential dispersal abilities of the isolated species on the palaeoislands increased genetic isolation leading to speciation.

PAIC theory can adequately explain speciation of Philippine taxa within the last 5 million years. Thus it is not surprising that the theory can explain phylogenetic relationships in taxa in the younger Philippine islands. PAIC theory predicts the following (Esselstyn et al. 2010):

1) Populations in a given island should be more related from populations in other islands;
2) Populations within an island should be genetically more related than similar populations in other islands;
3) Monophyletic lineages should be found within one island and not across several islands.

Luzon being the oldest of the Philippine oceanic islands at 35 My and dating back to the Eocene presents complications to the PAIC theory. In contrast, predictions of PAIC is more easily verified for the younger PAIC islands like Negros and Panay

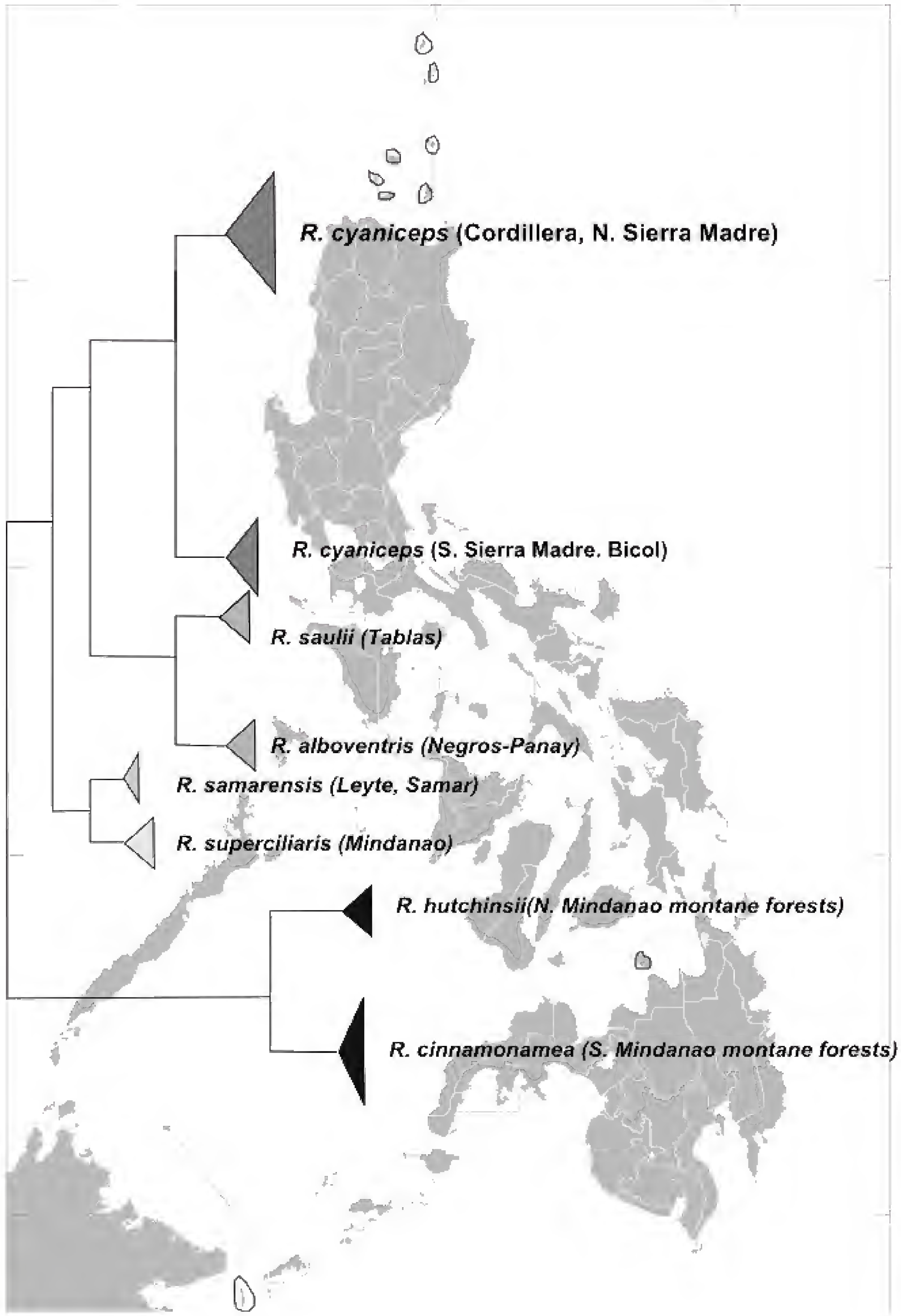

Figure 5. Phylogeny of endemic Philippine *Rhipidura* Vigors, Horsfield, 1827 (modified from Sanchez and Moyle, 2011).

(8-5 My) (Diesmos et al. 2002) in studies of phylogenies of reptiles and amphibians (Gaulke et al. 2007; Siler et al. 2007).

In Luzon, while there are taxa whose endemic status can be explained by PAIC, other factors that explain endemism need to be considered. One is the habitat preference of a taxon. In *Copsychus* Wagler, 1827 Magpie Robins and Shamas, the older species the Luzon Shama *C. luzoniensis* (Kittlitz, 1832) colonized Luzon and dispersed to Panay-Negros PAIC and persisted there since in those island, there were more habitats that suited it (Sheldon et al. 2009). Younger species originated from a more recent colonization from Sundaland in the last 5 My and they colonized Palawan and the oceanic islands of the central Visayas, where *C. cebuensis* (Steere, 1890) is an example. *Copsychus* can be divided into two ecological groups with the more vagile and coastal magpie-robins and the more inland rainforest dwelling shamas. The diversification of the latter in the Philippines can be easily explained by PAIC theory. In contrast the Philippine magpie-robins even in historically isolated Sibuyan Island have their nearest relations from species in ocean-

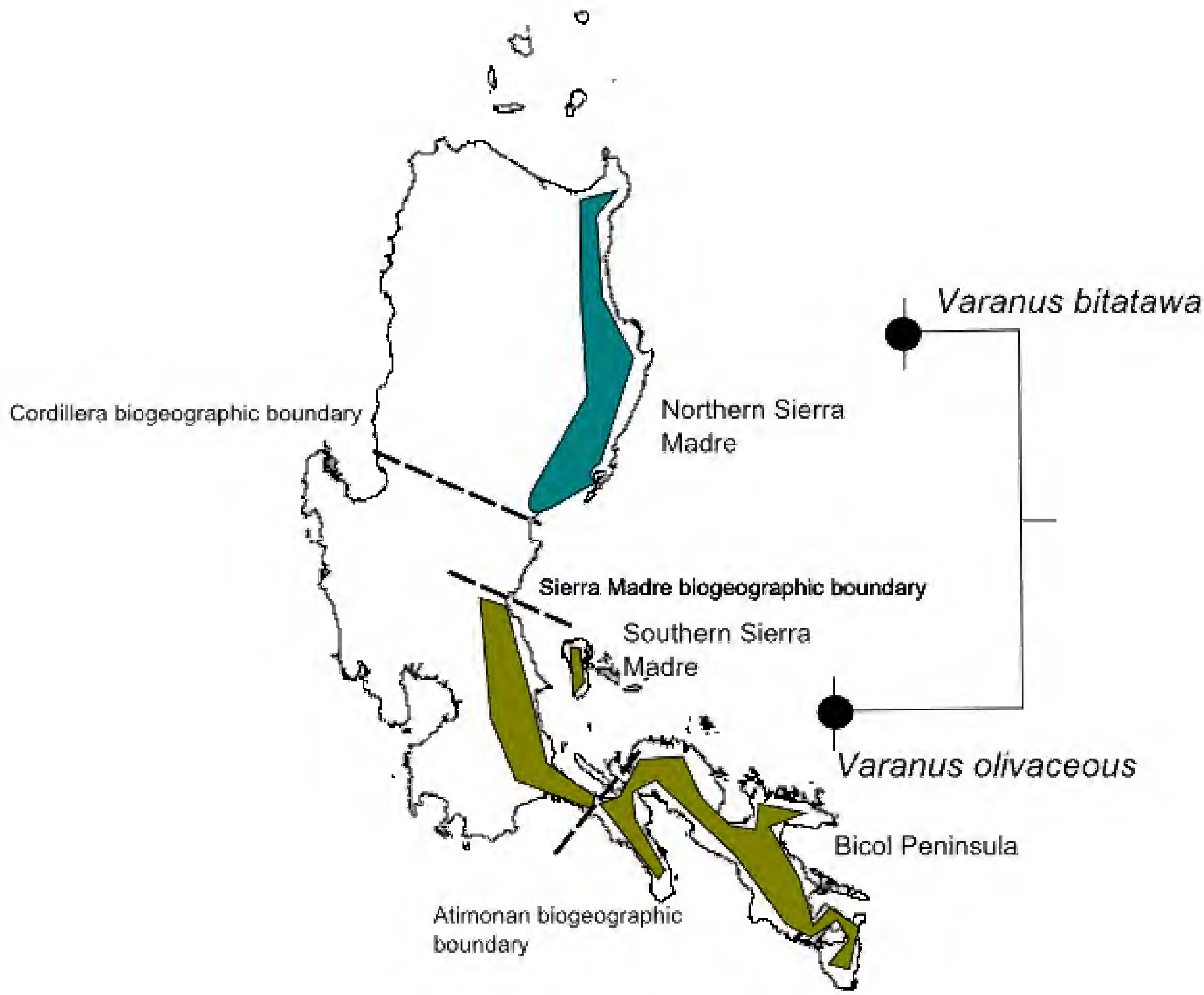

Figure 6. Distribution of Luzon's endemic varanids (after Siler et al. 2010).

ic Seychelles. Their affinities to presumed African ancestors imply a very early colonization through the Gondwana landmasses of India. This also is similar to the inferred phylogenetic history of the Philippine Eagle and its nearest extant related species, the Africal Bateleur eagle (Lerner et al. 2005; Vallejo Jr 2011). However based on the molecular phylogenetic data, *Copsychus* Wagler diversification in the Philippines can be dated to the early Pleistocene and Pliocene at the latest and possibly even earlier in the Miocene (Sheldon et al. 2009). Despite island coalescence as a result of sea level regressions, none of the Luzon and Negros- Panay PAIC species were able to colonize Mindanao.

Similar patterns of diversification can be noted in Philippine *Rhipidura* Vigors, Horsfield, 1827 (Fig. 5). Deep genetic divergences between and within PAIC islands species and populations indicate a pre Pleistocene colonization of the older PAIC oceanic islands of Luzon, Mindanao and Negros-Panay.

However for taxa whose radiation occurred during the Pleistocence, the predictions of PAIC theory are well verified (Esselstyn et al. 2009) especially the isolation by distance model. However analysis of molecular variation (AMOVA) in these taxa shows the dominant role of intra-island isolation and breaks to gene flow. In fact this is the dominant proportion that accounts for genetic variation in the largest and oldest oceanic islands of Luzon and Mindanao (Esselstyn et al. 2009). A possible factor that generated this variation is sympatric speciation (Esselstyn et al. 2009) which may explain diversification in a coalesced island like Sulawesi (Esselstyn et al. 2009).

Distribution anomalies in northern Luzon, other factors for endemism

The current reconstructions of phylogenetic histories of amphibian and reptile taxa from northern Luzon show the affinities between the Zambales, Cordillera and Northern Sierra Madre mountains (Diesmos et al. 2004). One species of frog *Platymantis pygmaeus* Alcala, Brown, Diesmos, 1998 from is found in northern Luzon and in the oceanic island of Sibuyan in the Sibuyan Sea (Diesmos et al. 2004). Sibuyan island was never connected with any of the Pleistocene palaeoislands (Heaney 1998). Despite intensive sampling in similar habitats in southern Luzon and Bicol peninsula, the species was never recorded. Since *Platymantis* Günther, 1858 is rainforest associated does not disperse over the sea, this distribution remains enigmatic.

For the northern Luzon murines, it is possible that during the Pleistocene the extant Cordillera species or their close relatives were found in lower elevations. Archaeological excavations in Callao Cave, Peñablanca in Cagayan Province (85 m elevation) (17°42'11.74"N, 121°49'25.5"E) revealed the presence of *Apomys* Mearns and *Batomys* Thomas fossils. *Apomys* is found from Luzon, Mindoro, Negros, Panay to Mindanao having dispersed to these areas during the Pleistocene sea level regressions (Steppan et al. 2003). The phylogenetically older *Batomys* is found only in Luzon and Mindanao (Jansa et al. 2006) but now are found in higher elevations.

It is thus possible that the Pleistocene climate favoured the dispersal of the mountain murines of the Philippines across the Luzon central plains. If this is possible then other taxa with similar habitat requirements may have done so. However it is less likely that a close canopy lowland tropical rainforest existed in the Luzon Pleistocene. It is more likely that lowland rainforests contracted in the drier and cooler climate with some areas serving as refugia and stepping stones to dispersal (Schneider et al. 1999). This may also have been the factor for vicariant speciation. Also it is possible that the Pleistocene taxa were not as closely associated to rainforests as they are today but were more generalist (Heaney et al. 2011). Thus they could have dispersed through hypothesized montane forest refugia at lower elevations as has been demonstrated in the archaeological record in Papua New Guinea (Pasveer et al. 2002).

Integrating the paradigms, the Philippine islands as "mini-Sulawesis"?

Recent studies on the distribution and phylogeny of Luzon's endemic flora and fauna suggest that the Pleistocene Aggregated Island Complex (PAIC) theory to explain the evolution of biodiversity in the Philippines is simplistic and may apply only for the Plio-Pleistocene epochs. However since much of the species radiation occurred during this time period, especially for the small mammals, this pattern remains most observable. While phylogenetic reconstructions of species diversification support the PAIC theory, analysis of molecular genetic variation suggests intra-island isolation possibly by sympatry.

The dynamic geological history of Southeast Asia and most especially the Philippine archipelago provides many opportunities for colonization and allopatric diversification. Allopatric diversification is likely determined by the physical geography of the islands themselves. Luzon has the greatest estimate of nucleotide diversity in shrews and much of this occurred in the Holocene, as diversity has more correlation with the age and size of the modern island than that of the paleaoisland (Esselstyn et al. 2009). This also implies the importance of orography and the likely influence of Holocene climate change which caused changes in vegetation and land cover. This may be a factor in the colonization of the Philippine islands by the bulbuls, where certain clades effectively colonized the oceanic islands and others only the continental islands (Oliveros et al. 2010).

Another factor that makes it more difficult to ascertain the direction of colonization which varies between taxa is the relative closeness of the Philippine islands to each other (Jones et al. 2008). Colonization came from various directions and since the archipelago is close to the Sundaland island of Borneo, much of the biotic affinity is broadly recognizable as Asian although with a significant Australo-Papuan component. For mammals, the Australo-Papuan component is demonstrated by the *Chrotomys* Thomas radiation (which includes *Apomys* Mearns) of "new endemic" rodents (Steppan et al. 2005; Jansa et al. 2006).

If viewed in a deeper time scale, the affinities of the recent species radiation on Luzon may be explained by panbiogeography and the correlation of tectonic features with evolution. While the theory of island accretion is well described for Wallacea, this investigatory angle is hampered by the current lack of information on the timing of island accretion and emergence in that region (Lohman et al. 2011). Dispersal and subsequent allopatry may be the most parsimonious theory to account for species diversification in the region. However certain taxa may reflect the influence of tectonic vicariance (Evans et al. 2009) in coalesced islands like Sulawesi. If vicariance had been a signal for speciation in the proto Philippines, then this signal has been reduced by the effects of the formation of the modern archipelago which facilitated dispersal related allopatry (e.g. post vicariance dispersal).

Luzon and Mindanao as hypothesized by Roy Dickerson may have been coalesced archipelagos by themselves. Tectonic uplift and further coalescence made them into the modern archipelago they are today. While there appears to be a signal for vicariance related diversification (e.g. in *Varanus, Scheleffera* and *Rafflesia*), there is not enough information to warrant more inferences. A concerted research effort in floral and faunal biodiversity assessments and the consequent phylogenetic studies are needed to verify the vicariance hypothesis. This research will have to be in tandem with research in tectonics in determining with more accuracy, the timing of island coalescence and accretion and biological speciation.

Luzon shows the signature of being a mini-Sulawesi in terms of tectonic characteristics and its biotic evolution. If this is verified, then the dimensions of biodiversity in the Philippine archipelago will become more complex for it is very likely that islands like Mindanao, Panay, Negros have similar tectonic and evolutionary histories. This fulfils Alfred Russel Wallace's prediction that the geological history of an area can be inferred from its biogeography.

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THE ENTOMOLOGICAL SOCIETY OF LATVIA

The Entomological Society of Latvia (ESL) was founded in 1951. The ESL has two subdivisions: the Section of Coleopterology founded in 1996, and the Nature Research Division founded in 1999. The Society has about ~45 members from Latvia, and near 25 members from other countries.

The aims of the Society are: to promote development of entomology in Latvia, to popularise entomological knowledge, to attract members active in fundamental and applied research in entomology, to offer methodological assistance to educational institutions, and to develop international collaboration in entomology and related disciplines.

The investigations carried out by Latvian entomologists are parts of research grants, international projects, or through the initiative of individual members.

The main activities of Latvian entomologists are as follows:

♦ Publication of the journal "Latvijas Entomologs". In 2013, the 52nd issue appeared. The reprints are available in PDF format at http://leb.daba.lv

♦ Participation in NGO activities via comments on drafts of legislative acts, particularly those concerning protected species, and conservation of nature in forests and agricultural lands.

♦ Members of the Society are leaders in expertise concerning invertebrates in the NATURA2000 sites; they monitor species of EU importance and prepare basic information for reporting to the EU Commission. Certified experts provide the needed expertise for the territories where any human activities are planned.

♦ Every year the Society elects an 'Insect of the Year' and an 'Invertebrate of the year', and distributes knowledge about these particular species in mass media, museums, schools etc. The Society has done this for the past 13 years.

♦ Members work with school children promoting the development of their first scientific studies. We also participate in the Nights of Scientists.

♦ The Society organises excursions (in winter, spring and summer) to any of the protected territories to get additional knowledge about the territory and to educate enthusiasts.

♦ The Society implements a limited number of research projects, mostly ordered by governmental institutions.

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Review and assessment of the literature on recent non-marine molluscs of the Papuan biogeographical region

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Abstract: A complete bibliography (including an author index) of the literature on the recent land and freshwater molluscs of the Papuan biogeographical region is presented, totalling 798 entries. An author index of 271 names as also a list of 138 periodical journals are provided. Results of preliminary analysis of bibliographic sources are presented and discussed.

Key words: Terrestrial & freshwater Mollusca, bibliography, history, malacology, Papuan biogeographical region, New Guinea, Moluccas, Solomon Islands, Wallacea.

Introduction

New Guinea and Wallacea are ranked amongst the top biodiversity hotspots on the planet (Reichholf 2003), and yet remain insufficiently studied in all aspects of invertebrate zoology. This paper, drawers together, for the first time the existing literature on recent non-marine molluscs of the Papuan region.

In contrast to the intensively studied Oriental region, comparatively little attention has been given to malacological studies in areas eastward of Weber's Line, especially in the last half century. Most of bibliographical sources available on non-marine molluscs of the Papuan region were published before the 1970's, often in old or obscure journals. Current malacological research faces the problem of discovering the necessary bibliographical sources to enable their research to begin.

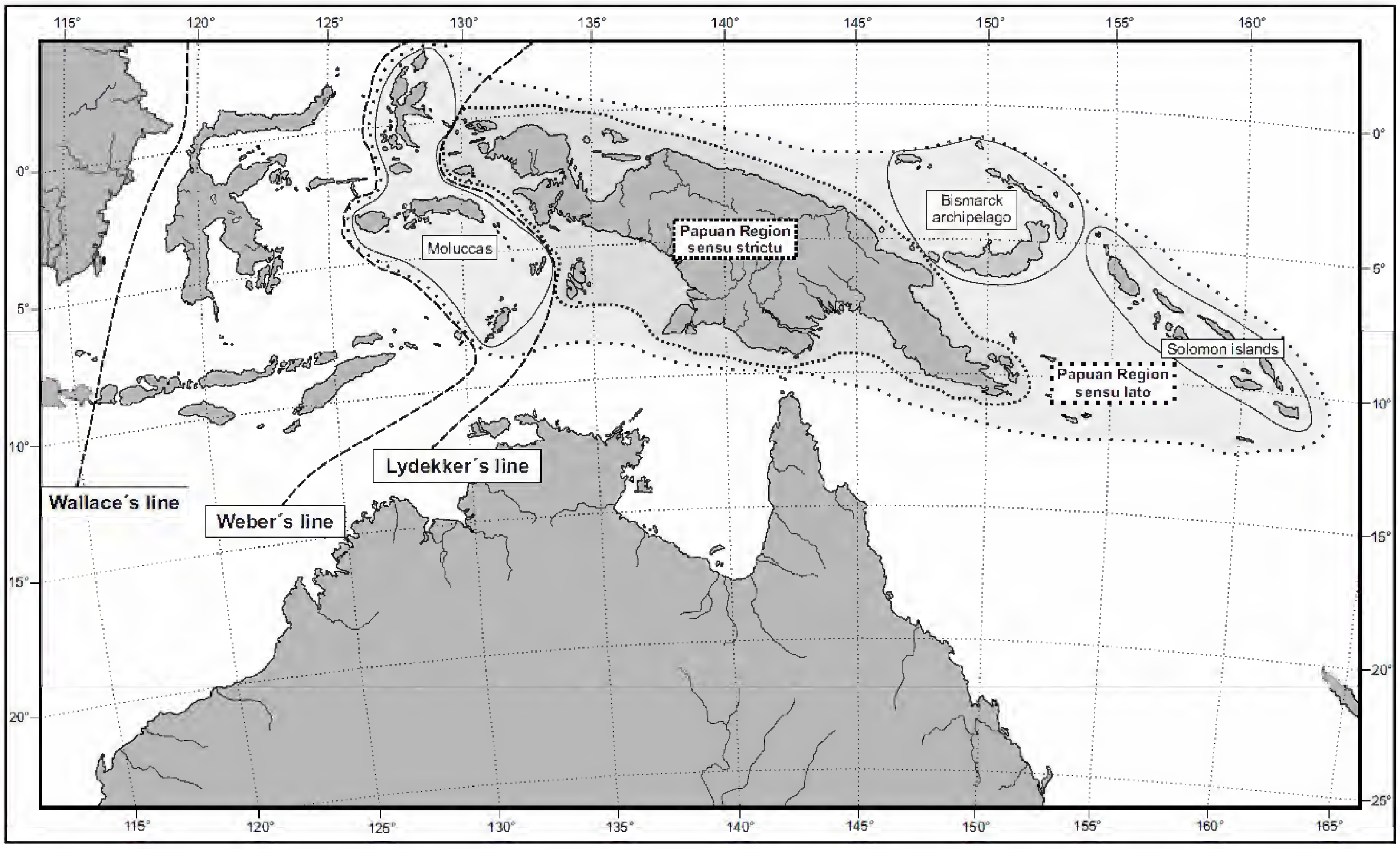
Assessment of available bibliographical information on non-marine molluscs are useful in providing a focus for researchers to direct their interest toward geographical areas where information gaps exist, and also providing conservationists with the information on most diverse and valuable areas or endemism hotspots.

Here we present the first comprehensive overview of literature for recent non-marine molluscs (brackish water taxa included) of the Papuan biogeographical region. We list 798 bibliographical sources, author index of 271 names and a periodical index of 138 journals. Evaluation of geographical component (number of publications by main geographical objects of the Papuan region) is also undertaken for the first time.

Material and methods

The term "Papuan Region" (or in the strict zoogeographic sense - the Papuan subregion of the Australian Region) is often listed in zoological or zoogeographic literature. However, "New Guinea" is sometimes incorrectly used as a synonym for this region (e.g. Darlington 1962, 1971) (Riedel 2002) and sometimes it is mentioned explicitly without further explanation (e.g. Mayr 1944). Only a few specialists clearly define this region (Beehler et al. 1986; Gressitt 1982; Riedel 2002; Telnov 2011).

The study area (Map 1) extends over a territory of ~4.400 km from the Moluccas in the West to the Solomon Islands in the East. The study area is limited by Weber's Line in the West and further included the following insular systems and large islands: Indonesian administrative provinces of North Moluccas (excluding Sula Islands), Central and partly Southwest Moluccas (inclusive Tanimbar Islands & Kei Islands), as also Raja Ampat, New Guinea (both Indonesian and Papua New Guinea) with all satellite islands (Aru Islands, Cenderawasih Bay islands, Torres Strait Islands, Bismarck and Admiralty islands, as well as Louisiade Archipelago and D'Entrecasteaux Islands), and



Map 1. Map of study area and the surrounding regions, showing important zoogeographic lines. Papuan region is shaded in grey (redrawn fromThe Times Atlas of the World (1994), with modifications by Riedel (2002)).

Solomon Islands. For some reason, Talaud Islands north of Halmahera as also Sula Islands (administratively North Moluccas (Maluku Utara), but biogeographically a part of Sulawesi fauna) are also included into our publication. In other words, the study area includes an eastern part of Wallacea (the Moluccas) and "true" Papuan islands.

During the compilation of this list several decisions had to be made about what to include and what not. We limited ourselves to:

a) Primary and secondary sources, i.e. directly treating Papuan taxa and relevant to the recent Papuan malacofauna;

b) Publications dealing with the general malacology, i.e. global checklists or catalogues, type collection catalogues, popular science literature, photo guides etc.

For publication dates of early volumes forming the Annals and Magazine of Natural History we followed Evenhuis (2003b). Both printed and digital publications were assessed and included. If not specially stated, all titles are checked by the authors. Authors comments are placed in square brackets [ ].

Remarks

Although we have based our work on different sources and cross-checked as far as possible, this paper may contain. We are aware that this compilation is incomplete and some references may have been ommited. Nevertheless we are confident that it will raise the present level of knowledge on the diverse and threatened malacofauna of the Papuan region and encourage new research activities in this field.

"Papuan species" in the authors' comments always referes to species from the Papuan biogeographical region in the broad sense, and not only from the island of New Guinea (Indonesian Papua / Papua New Guinea).

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4 - According to Clark & Crosnier (2000).

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Discussion

As stated in the "Introduction", despite the relatively large number of available bibliographical sources (798 in total) on the Papuan region, only a few authors were specialists on the Papuan malacofauna. Table 1 illustrates the ratio of authors and the number of their publications. It is clearly demonstrated that the large majority (78%) are "occasional authors" who published up to 3 works referring to Papuan molluscan taxa.

The oldest published record for the Papuan region dates 1705 (Rumphius 1705: "*D'Amboinsche Rariteitkamer...*"). In this extensive book (Fig. 2), several species of molluscs from Central Moluccan islands of Ambon and Seram were mentioned.

Of the 271 authors that contributed to malacological studies of the Papuan region, 149 published a single paper and 41 authors published only two papers. Of the authors that contributed the highest numbers of papers on Papuan taxa, L. Pfeiffer (72 publications), K. Martens (28) and W. Kobelt (26) were the most prolific (see "Author index" for detailed information).

Table 1. Authors and their publications: percentage ratio.

Number of publications	Per-cent of authors
1	54%
2	15%
3	9%
4	6%
more than 4	16%

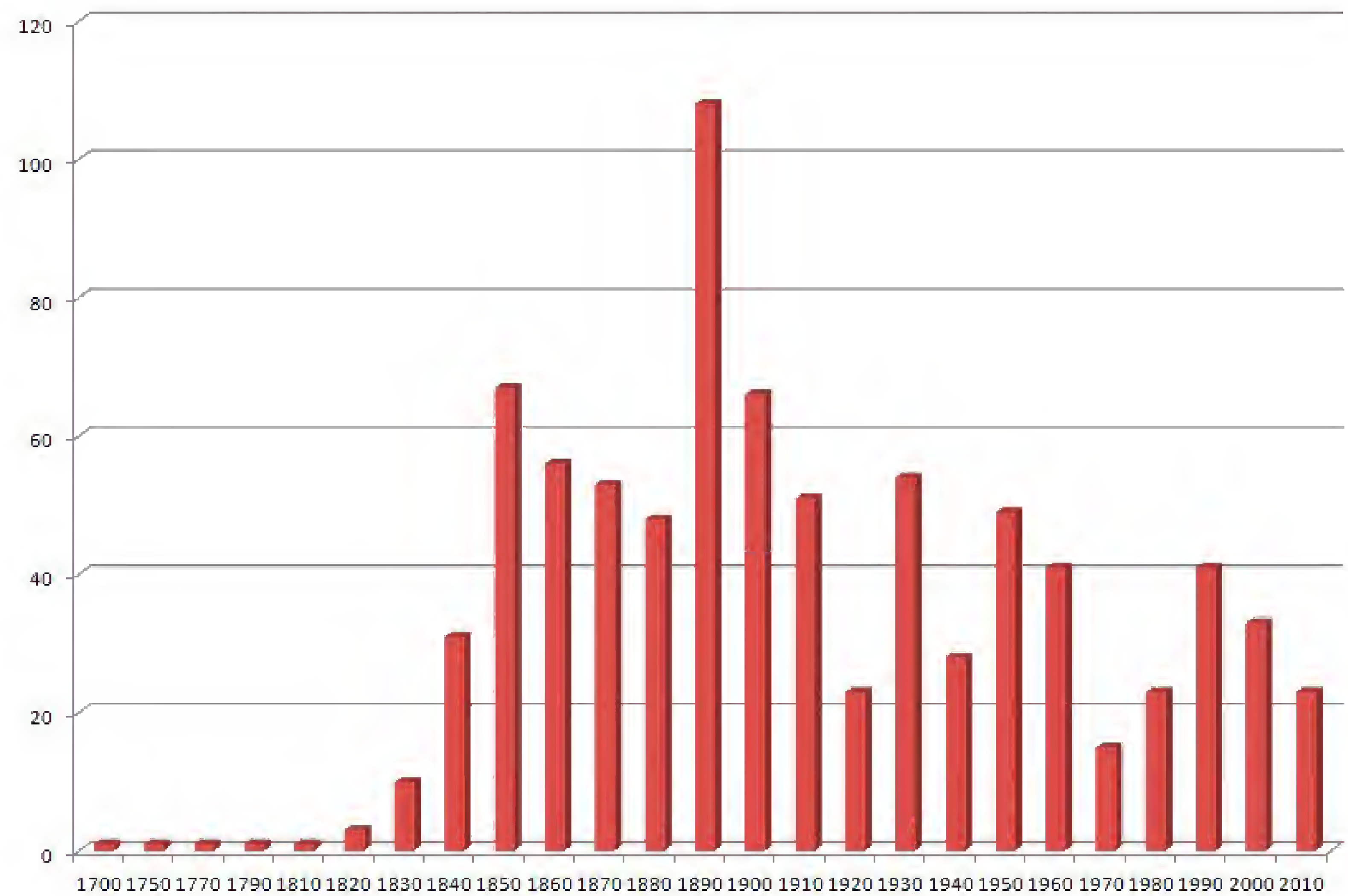

Figure 1. Number of published works referring to the Papuan malacofauna by decades.

The first publication on molluscan taxa from the Papuan region appeared in 1705, and the number of papers remained constantly low until the mid-1800's. The most productive period was between 1850 and 1900, and in particular the 1890's. The maximum number of malacological publications on Papuan taxa, an impressive 107 works, were published between 1890-1900. It should be noted that there is a general trend in decline of publications since the 1960's, when W. van Benthem Jutting retired from her scientific activities (Fig. 1).

Of the total 798 publications, 636 (80%) are published in periodicals (scientific journals, reports), while the remaining 162 works (20%) are published in books, book chapters, checklists etc. Within the periodicals, the highest number referring to the Papuan malacofauna are found in two British (*Proceedings of the Zoological Society of London*, 75 papers; *Proceedings of the Malacological Society of London*, 36 papers) and two German journals (*Archiv für Molluskenkunde* and *Nachrichtsblatt der Deutschen malakozoologischen Gesellschaft*, each with 33 papers).

Geographical evaluation of malacological literature on the Papuan biogeographical region

This is the first attempt to classify published information on Papuan molluscan taxa according to their published geographical distribution. This evaluation is not pretending be full and complete. But it should give an insight how much information is available on which geographical part of the Papuan region.

We not targeted to evaluate all main geographical or / and geological structures of the Papuan region (for example, Central Cordillera or Bird's Head Peninsula of New Guinea) – this would be too hard task for the first attempt. Instead, we focused on islands or insular systems. For the first time we consciously selected territories unequal by area – from small to large islands or their parts. Further assessment would be more detailed as we hope.

Publications with clear references of species' as also lower or higher rank taxa's distribution to the Papuan region are used for a geographical evaluation. In several case when geographical data not clearly or incompletely given, sources are referred for "general" geographical objects (e.g. Moluccan

Islands or New Guinea, not specifying exact island or part of it). General literature, as also checklists, catalogues, anatomical and other sources not referring to any of geographical objects are not considered. Erroneous locality data were not corrected.

Absolute majority of publications is devoted to malacofaunas of today's Eastern New Guinea (today's Papua New Guinea), the Bismarck Archipelago (inclusive Admiralty Islands) and the Solomon Islands (Table 2). Contrary, Raja Ampat and Moluccan islands (Lease Islands are an exception) as also Indonesian New Guinea are comparatively much less covered by malacological records.

Table 2. Records of the Papuan molluscan taxa by geographical components.

Island / island group (alphabetically)	**Referring bibliographical sources**	**Remarks**
Bismarck Archipelago (incl. Admiralty Islands)	7, 8, 13, 15, 25, 31, 33, 41, 42, 50, 54, 88, 89, 97, 103, 106, 107, 108, 134, 139, 145, 175, 178, 182, 184, 189, 192, 200, 203, 220, 228, 232, 238, 239, 241, 252, 258, 261, 275, 280, 286, 289, 290, 291, 295, 322, 323, 324, 326, 327, 337, 339, 340, 341, 342, 344, 368, 370, 386, 391, 394, 395, 396, 403, 404, 422, 423, 448, 452, 454, 458, 473, 476, 480, 487, 491, 493, 496, 499, 501, 503, 504, 506, 507, 509, 514, 521, 524, 527, 528, 529, 543, 550, 773, 563, 567, 568, 573, 575, 580, 581, 582, 583, 584, 586, 587, 588, 589, 590, 591, 593, 595, 605, 609, 610, 630, 636, 638, 640, 651, 653, 655, 656, 657, 663, 669, 677, 679, 680, 681, 685, 688, 689, 692, 699, 716, 720, 723, 731, 733, 739, 760, 770, 771, 772, 783, 786	There are a number of confusions by early authors when indicating localities for Bismarck and Admiralty islands. Many species described as from Admiralty Islands are in fact not occurring on them and may refer even to the Western Solomons. We do not split bibliographical records to separate islands to avoid further chaos
The Moluccas, general	18, 52, 57, 58, 83, 176, 186, 229, 238, 239, 244, 286, 330, 336, 339, 348, 360, 364, 381, 384, 386, 391, 393, 396, 400, 402, 404, 431, 454, 466, 468, 470, 475, 483, 487, 493, 499, 507, 517, 518, 519, 521, 522, 524, 525, 527, 528, 529, 532, 536, 541, 555, 773, 567, 568, 573, 574, 607, 609, 610, 614, 617, 618, 630, 645, 657, 673, 674, 699, 716, 717, 718, 720, 731, 733, 738, 739, 741, 742, 743, 746, 747, 749, 750, 752, 767, 768, 770, 771, 772, 797	
North Moluccas (Maluku Utara), general	385, 524, 610, 750, 753	
Bacan & Tawali Kecil	10, 52, 58, 103, 117, 187, 228, 336, 339, 340, 341, 348, 373, 382, 385, 386, 388, 391, 396, 404, 506, 509, 521, 524, 527, 528, 568, 570, 573, 606, 631, 670, 680, 706, 716, 717, 718, 720, 731, 739, 741, 745, 747, 753, 770, 772, 773	
Gebe	190, 198, 228, 341, 706, 739, 772	

Halmahera	4, 5, 48, 58, 110, 117, 193, 200, 223, 228, 229, 287, 334, 335, 336, 339, 340, 341, 348, 373, 374, 375, 376, 382, 385, 386, 388, 389, 391, 404, 426, 441, 517, 521, 524, 527, 528, 529, 573, 604, 609, 610, 631, 647, 670, 703, 705, 706, 716, 717, 728, 731, 738, 739, 741, 745, 750, 752, 753, 770, 771, 772, 773, 797	
Kayoa, Makian, Moti, Ternate, Tidore	58, 117, 223, 228, 284, 287, 336, 339, 340, 341, 348, 366, 382, 385, 386, 388, 389, 391, 396, 404, 426, 511, 521, 524, 527, 528, 536, 566, 568, 573, 576, 609, 610, 645, 670, 716, 738, 739, 741, 745, 753	
Morotai	228, 391, 741, 753, 768	
Obi Islands	146, 147, 227, 228, 229, 340, 341, 342, 348, 373, 382, 386, 391, 405, 406, 426, 441, 536, 553, 573, 576, 606, 618, 679, 679, 680, 705, 706, 738, 739, 741, 749, 753, 772	
Sula (= Xulla) Islands	573, 610, 616, 618, 773	
Talaud Islands	92, 187, 413, 574, 741	
Central Moluccas (Maluku Tengah), general	750	
Banda Islands	49, 58, 223, 228, 231, 287, 339, 342, 364, 373, 388, 391, 394, 404, 521, 527, 529, 536, 540, 573, 576, 610, 613, 645, 679, 679, 680, 731, 738, 741, 745, 746, 770, 772	
Buru & Ambelau	49, 52, 57, 58, 117, 187, 239, 249, 340, 342, 347, 348, 373, 380, 386, 387, 388. 389, 391, 404, 426, 441, 521, 527, 528, 536, 546, 573, 609, 610, 612, 618, 716, 717, 730, 731, 738, 741, 746, 749, 750, 772, 773	
Lease Islands (Ambon, Haruku, Nusa Laut, Saparua)	5, 18, 22, 39, 45, 49, 58, 59, 79, 83, 85, 149, 176, 187, 223, 225, 228, 229, 239, 287, 336, 339, 340, 342, 344, 347, 348, 360, 362, 365, 381, 383, 384, 386, 389, 390, 391, 392, 394, 396, 397, 401, 407, 437, 438, 440, 454, 465, 472, 492, 493, 494, 521, 525, 527, 528, 529, 534, 536, 539, 540, 541, 555, 773, 565, 567, 569, 572, 573, 576, 577, 607, 608, 609, 610, 612, 617, 618, 635, 643, 645, 655, 656, 679, 679, 680, 688, 702, 711, 716, 717, 718, 720, 731, 733, 738, 741, 743, 745, 746, 748, 749, 750, 752, 756, 767, 770, 772, 773, 797	
Seram	26, 49, 58, 60, 86, 176, 228, 229, 239, 272, 339, 340, 341, 347, 348, 366, 373, 386, 388, 390, 391, 396, 493, 495, 512, 513, 514, 520, 521, 527, 536, 573, 574, 576, 607, 608, 609, 610, 612, 618, 620, 630, 648, 711, 716, 717, 718, 731, 738, 741, 746, 749, 750, 770, 772, 773	
Seram Laut Islands	86, 391, 527, 528, 532, 552, 573, 610, 717, 718, 738, 773	

South West Moluccas (Maluku Tenggara Barat), general	575	
Aru Islands	4, 5, 20, 52, 53, 55, 56, 58, 63, 93, 103, 166, 228, 239, 244, 340, 342, 366, 367, 373, 386, 391, 404, 502, 506, 509, 521, 524, 527, 528, 536, 540, 567, 573, 574, 607, 609, 610, 611, 622, 655, 679, 680, 688, 699, 707, 708, 715, 716, 718, 721, 731, 732, 738, 739, 748, 750, 754, 755, 756, 757, 758, 767, 768, 770, 772, 773, 781, 797	
Kei Islands	52, 54, 55, 223, 293, 361, 373, 404, 552, 573, 576, 610, 655, 707, 716, 738, 743, 749, 756, 767, 770, 772, 773, 797	Records for “Key Bandas” also referred to here
Tanimbar (= Timorlaut) Islands	52, 56, 173, 186, 187, 199, 223, 239, 342, 364, 373, 391, 417, 419, 529, 532, 540, 541, 573, 610, 631, 680, 766, 767, 772	A number of confusions for Tanimbar Islands in earlier publications
New Guinea, general	17, 18, 19, 23, 38, 40, 43, 56, 58, 82, 83, 84, 87, 93, 96, 117, 118, 136, 142, 158, 160, 167, 172, 181, 182, 188, 192, 219, 229, 244, 247, 267, 286, 289, 303, 314, 331, 332, 336, 337, 340, 341, 343, 347, 348, 361, 363, 375, 376, 381, 384, 385, 386, 391, 393, 397, 401, 404, 411, 420, 421, 426, 429, 445, 447, 451, 452, 454, 459, 473, 484, 493, 499, 513, 518, 519, 521, 522, 524, 525, 527, 528, 529, 535, 536, 537, 539, 540, 547, 554, 558, 559, 555, 773, 560, 566, 568, 570, 573, 578, 607, 609, 610, 622, 625, 629, 638, 660, 664, 667, 672, 679, 680, 681, 688, 695, 699, 712, 716, 718, 720, 731, 733, 734, 738, 739, 742, 746, 747, 748, 749, 750, 755, 756, 757, 758, 767, 769, 770, 771, 772, 777, 783, 784, 797	No detailed evaluation made for main geological components of New Guinea (for example, Central Cordillera, Peninsulas, southern lowlands etc.)
Indonesian Papua (excl. Biak, Numfoor & Yapen)	4, 5, 10, 27, 44, 48, 52, 61, 77, 103, 119, 120, 143, 159, 161, 162, 163, 169, 196, 197, 200, 211, 223, 224, 225, 226, 227, 228, 229, 239, 240, 242, 248, 250, 251, 255, 265, 272, 283, 287, 298, 300, 302, 306, 311, 330, 339, 340, 341, 342, 344, 348, 349, 366, 370, 375, 386, 391, 404, 408, 412, 425, 439, 450, 462, 524, 527, 528, 529, 535, 551, 773, 566, 571, 602, 607, 610, 621, 622, 627, 630, 650, 651, 656, 669, 671, 672, 680, 681, 682, 704, 706, 707, 709, 710, 713, 714, 715, 716, 717, 718, 733, 734, 738, 739, 754, 755, 756, 757, 758, 767, 768, 772, 773, 781, 783, 795	
Biak, Numfoor (= Mafor) & small surrounding islands	4, 5, 201, 211, 228, 229, 528, 548, 638, 672, 688, 709, 718, 734, 739, 754, 755, 756, 757, 758, 767, 768	
Yapen	228, 341, 529, 709, 716, 718, 739, 754, 755, 756, 757, 758, 770, 772, 781, 783	

Papua New Guinea	1, 14, 16, 21, 24, 28, 47, 51, 54, 63, 68, 69, 70, 71, 74, 76, 90, 99, 102, 104, 105, 106, 107, 108, 109, 112, 114, 115, 137, 144, 145, 162, 180, 183, 184, 189, 206, 224, 225, 228, 229, 233, 237, 238, 239, 247, 248, 252, 255, 256, 260, 263, 268, 270, 271, 272, 273, 274, 275, 276, 281, 282, 285, 287, 300, 301, 304, 306, 307, 308, 330, 333, 338, 339, 340, 341, 342, 345, 346, 347, 348, 349, 350, 351, 352, 368, 377, 379, 394, 396, 398, 399, 403, 404, 408, 409, 415, 416, 418, 422, 424, 428, 434, 435, 467, 524, 526, 527, 528, 529, 532, 535, 539, 540, 545, 548, 549, 571, 573, 580, 595, 600, 624, 626, 627, 628, 630, 632, 637, 638, 640, 642, 644, 649, 650, 651, 658, 662, 663, 665, 666, 668, 669, 671, 672, 675, 676, 680, 681, 682, 689, 704, 716, 718, 719, 723, 738, 739, 743, 754, 756, 757, 758, 762, 768, 770, 771, 772, 781, 782, 783, 784, 798	Records for the former German & British New Guinea are referred here. Small islands along the northern coast are also referred here
D'Entrecasteaux, Louisiade & Trobriand (= Kiriwina) islands, Muyua (= Woodlark) Island	14, 30, 54, 65, 67, 71, 121, 132, 133, 162, 180, 200, 202, 232, 239, 257, 263, 268, 272, 277, 285, 305, 339, 340, 342, 347, 377, 378, 386, 391, 404, 424, 427, 473, 515, 527, 528, 529, 532, 540, 595, 630, 641, 650, 654, 656, 658, 659, 663, 665, 666, 669, 671, 672, 676, 680, 681, 690, 691, 693, 696, 731, 733, 739, 768, 770, 772, 783, 797	
Torres Strait Islands	66, 68, 72, 123, 162, 195, 217, 223, 232, 239, 366, 401, 404, 483, 527, 532, 539, 540, 607, 610, 661, 681, 697, 730, 739	Administratively Australian, these islands hold typical Papuan malacofauna
Raja Ampat Islands, general	229	
Batanta	309, 750	
Gag	228, 391, 776	
Misool & Weeim	4, 5, 6, 52, 224, 225, 227, 228, 229, 239, 248, 255, 336, 340, 391, 404, 513, 521, 524, 527, 528, 573, 610, 615, 681, 686, 688, 717, 718, 734, 739, 750, 751, 755, 756, 757, 758, 767, 768, 773	
Salawati	228, 309, 394, 404, 718, 750, 755, 756, 757, 758	
Waigeo, Rawak, Mansuar & surrounding islands	10, 25, 48, 52, 103, 149, 150, 176, 228, 229, 239, 244, 245, 261, 275, 309, 337, 339, 340, 341, 342, 344, 386, 391, 403, 404, 454, 487, 513, 514, 516, 521, 524, 525, 527, 528, 535, 542, 554, 617, 618, 619, 620, 671, 705, 706, 716, 717, 733, 734, 739, 741, 750, 755, 756, 758, 768, 773	
Wayag	228	

Solomon Islands, general	7, 12, 17, 33, 34, 37, 42, 67, 72, 75, 81, 88, 91, 95, 103, 106, 107, 113, 124, 125, 126, 127, 128, 129, 130, 131, 132, 135, 138, 140, 155, 156, 174, 192, 210, 228, 238, 239, 241, 243, 246, 253, 255, 258, 265, 266, 267, 275, 278, 279, 299, 325, 339, 340, 341, 342, 344, 347, 356, 360, 366, 386, 391, 394, 395, 403, 404, 444, 445, 446, 447, 453, 463, 469, 471, 477, 478, 479, 480, 481, 482, 486, 487, 489, 490, 491, 493, 495, 497, 498, 499, 505, 510, 515, 521, 527, 528, 529, 531, 532, 560, 561, 564, 566, 567, 568, 569, 570, 585, 593, 595, 607, 625, 630, 656, 662, 672, 677, 678, 680, 684, 691, 699, 704, 716, 733, 730, 731, 737, 738, 739, 770, 771, 772, 775, 776	There is much confusion of early authors concerning Western Solomon islands with Bismarck Archipelago islands
Bougainville, Buka, Shortland, Simbo (= Eddystone) & surrounding islands	17, 31, 54, 72, 88, 91, 100, 103, 137, 141, 145, 151, 153, 205, 240, 248, 394, 436, 506, 507, 524, 527, 528, 532, 593, 594, 595, 639, 656, 676, 737, 739	Treasury Islands are also referred here
Choiseul Island	54, 66, 88, 91, 100, 155, 156, 207, 528, 593, 595, 656, 676, 739	
Guadalcanal, Tulaghi, Florida, Savo & surrounding islands	17, 30, 31, 37, 81, 88, 91, 100, 103, 130, 148, 152, 155, 156, 185, 204, 240, 259, 294, 340, 341, 444, 528, 529, 532, 592, 593, 594, 595, 656, 679, 683, 695, 735, 739, 771, 772	
Malaita & Gower	16, 54, 88, 91, 100, 155, 156, 157, 240, 254, 259, 294, 532, 584, 593, 594, 595, 658, 739	
New Georgia & surrounding islands of the Western Province	17, 30, 31, 54, 72, 88, 91, 155, 156, 209, 240, 241, 254, 257, 259, 527, 528, 529, 532, 592, 593, 595, 638, 656, 739	
Rennell Island	98, 100, 101	
Russell Islands	29, 72, 88, 91, 528, 593, 595, 739, 772	
San Cristobal, Uki, Santa Anna (= Owaraha) & surrounding islands	25, 31, 34, 37, 64, 72, 73, 78, 88, 91, 94, 100, 130, 155, 156, 208, 241, 257, 259, 294, 340, 430, 475, 528, 532, 565, 566, 592, 593, 594, 595, 656, 716, 731, 733, 739, 771, 772	
Santa Isabel	29, 30, 31, 32, 35, 37, 72, 75, 81, 88, 91, 100, 155, 156, 194, 257, 528, 532, 593, 595, 656, 739, 771, 772	

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Figure 2. Plate 27 of Rumphius (1705: 91-93) showing first non-marine molluscan species records from the Papuan region (© Biodiversity Heritage Library): I - *Pythia scarabaeus* Linnaeus, 1758 (listed as "*Cochlea imbrium*", from Ambon); O - *Planispira zonaria* (Linnaeus, 1767) (listed as first "*Serpentuli*", from northern coast of Seram); P - *Naninia citrina* (Linnaeus, 1758) (listed as "*Cochlea terrestris*", from Ambon); R - *Chloritis ungulina* (Linnaeus, 1758) (listed as second "*Serpentuli*", from Ambon).

Southern Thailand bryophytes I, with description of *Cololejeunea ramromensis*

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Abstract: T. Pócs, in cooperation with the Prince of Songkla University, together with S. Chantanaorrapint, K. U-Taynapuh, G.E. Lee, D. Tang and with S. Somadee, collected bryophytes in the southern part of Thailand, mainly in Nakhon Si Thammarat Province. The collection resulted in 540 bryophytes, mostly liverwort specimens belonging to about 170 species of which 150 taxa are already identified, mostly by the two authors. Among them 22 proved to be the first record to Thailand or to the whole Indochina and one, *Cololejeunea ramromensis* Pócs, new to science. A revision of *Lejeunea* species is in press, while identifications of *Drepanolejeunea* and some critical *Colura* and *Microlejeunea* species are to be published later. Analysing the distribution of the species, interesting biogeographic conclusions can be drawn. The dominance of Malesian species is obvious in contrast to northern Thailand, where the Himalayan-Chinese and southeast Asian elements form the majority.

Key words: *Cololejeunea,* epiphylls, Indomalesia, Khao Ramrome, Nakhon Si Thammarat.

Introduction

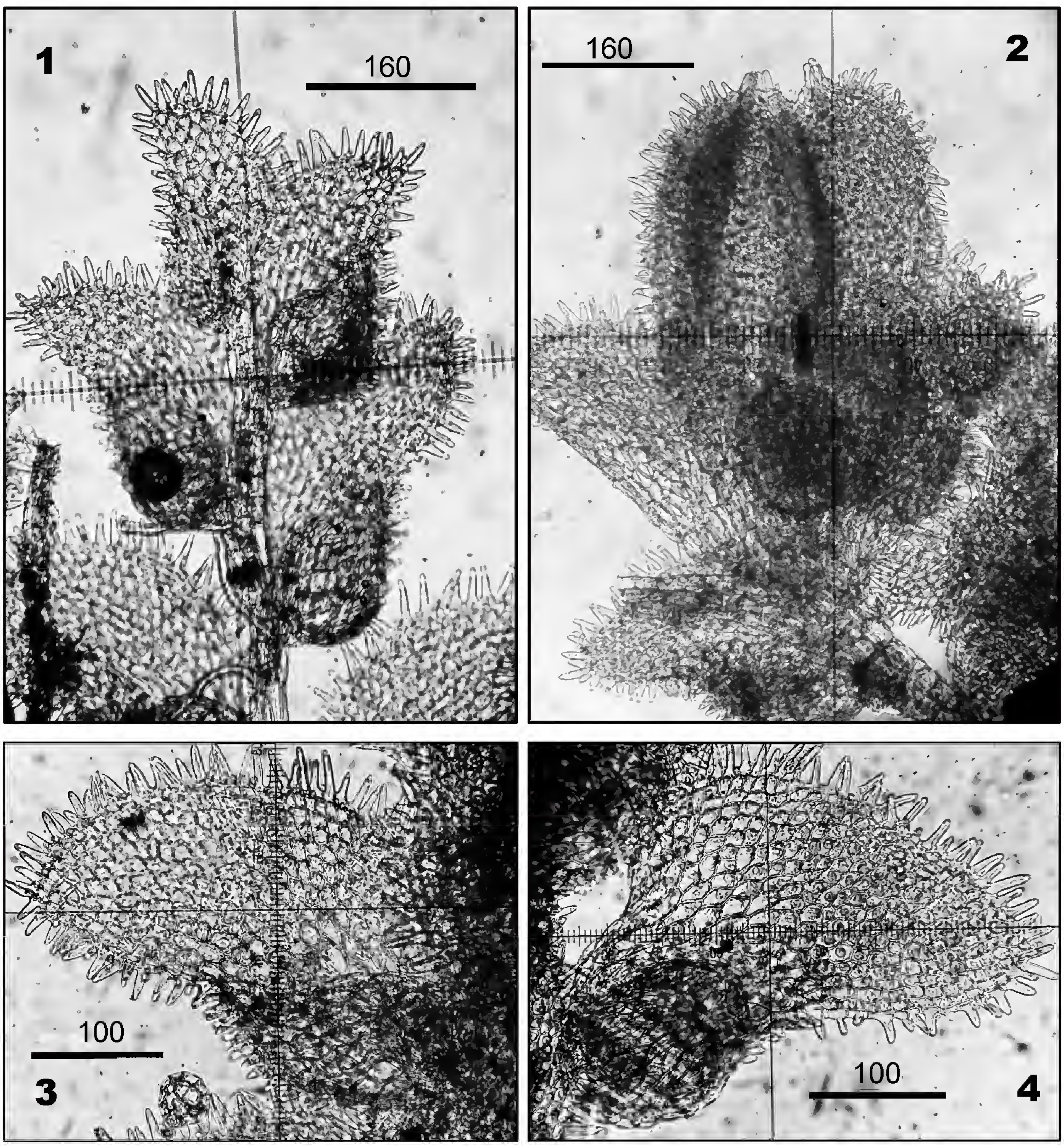
During the period between 24 October and 12 November the second author collected bryophytes guided or accompanied by S. Chantanaorrapint, K. U-Taynapuh, S. Somadee, botanists from Thailand, by G.E. Lee with her husband, D. Tang from Malaysia and by L. Papp, Hungarian entomologist. The aim of the collecting trip was to explore the less known bryoflora of southern Thailand, as the majority of previous collections originate from the northern half of the country. The exploration was carried out in cooperation with the Department of Biology, Faculty of Science, Prince of Songkla University, Hat Yai, Songkhla, Thailand. The first set of collected material is deposited in the herbarium of this University (PSU) and its duplicates are in the herbarium of the Botany Department, Institute of Biology, Eszterházy College, Eger, Hungary (EGR). Although during the trip we were able to visit only one locality (Khao Ramrome summit) at higher altitude (up to 945 m), the rich lowland and submontane rainforests also yielded many novelties. We tried to investigate also the oil bodies of liverworts during the field trip. In the following we give an account on the records new to science or to Thailand (according to Lai et al. 2008), identified by the two authors. The Calymperaceae materials were identified by S. Orbán and species of *Lopholejeunea* by A. Sass-Gyarmati (EGR). The *Lejeunea* species are revised and under publication by G.E. Lee et al. (2014) while the *Drepanolejeunea* material is studied by J. Inuthai (PSU).

Description of a new species

***Cololejeunea ramromensis* Pócs sp. nov.** (Figs 1-10)
Subgenus ***Cololejeunea***
Type material: holotype PSU, isotype EGR, *T. Pócs* and *G.E.Lee 1213/T*, Thailand: Nakhon Si Thammarat Prov.: Summit of Mt. Khao Ramrome 8 km NW of Ron Phibun town, on the N side of the sharp ridge around Khao Ramrome Resort at 930-940 m alt. 08°14.18'N, 99°48.182'E. Date: 29. Oct. 2012. Montane rainforest.

Derivatio nominis: The new species is named after its type locality, the summit of Ramrome Mountains, a very rich bryophyte habitat.
Description: Minuscule, sparsely, irregularly branching, pale witish green, 1-4 mm long plants with shoot width of 450–500 µm, creeping on living filmy fern (Hymenophyllaceae) leaves in montane

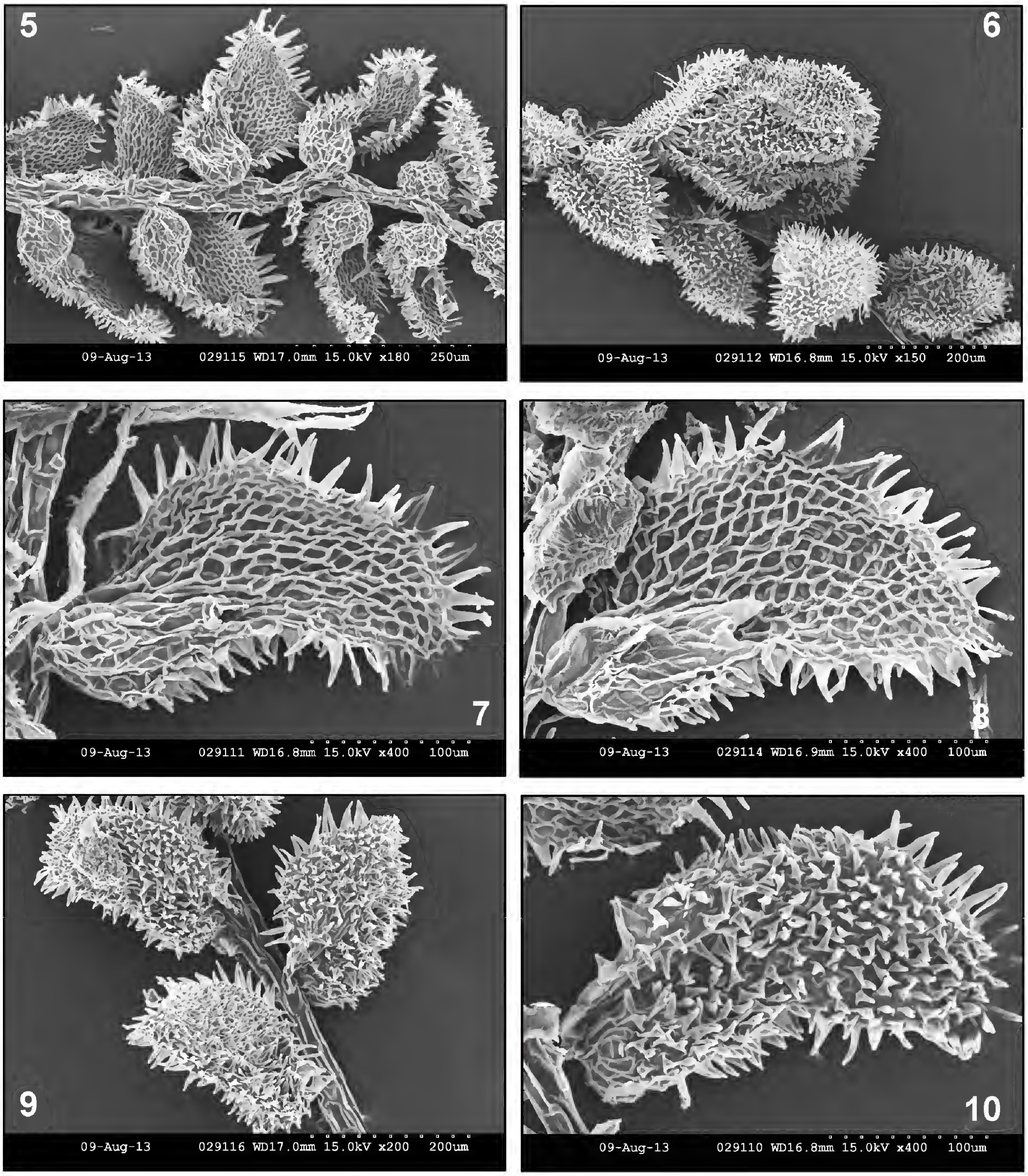
rain forest. Stem 25–40 μm thick, with one medullary and 5 cortical cell rows of which one forms the ventral merophyte. Branching thecal, *Lejeunea* type. Leaves distant, falcato-ovate, asymmetric, often with cuneate base. Size 300–350 x 120–195 μm, 18–23 cells wide. Lobe cells with thin walls and without trigones and any other thickenings. Marginal cells with ciliae 24–35 μm long. Submarginal cells subquadrate to rectangular, 10–12 x 7–9 μm, median lobe cells and lobule cells elongate rhomboid, 12–15 x 8–12 μm, basal ones more elongate, up to 36 μm long. Ventral side of lobe and lobule smooth, while on the dorsal side the cells bear 15–20 μm long ciliae, giving the leaves a "hirsute" surface. Lobule ovate, about 40% of the lobe length and width, with falcate or straight, one celled 1st and with a somewhat larger, 15-10 μm long 2nd tooth, which cross each other or lying parallel side by side. Hyaline papilla not seen. Stylus bicellular. Gemmae uncommon, round, consisting of 16 cells. Probably dioicous, as only female plants were observed. Gynoecium on shoot apex with one inno-



Figures 1-4. *Cololejeunea ramromensis* Pócs, sp. nov. 1 – Shoot, ventral view; 2 – Gynoecium; 3 – Leaf, ventral view; 4 – Leaf, dorsal view. All photographed from the holotype [scale bars in μm].

vation, female bracts about half perianth length and with lobule almost equalling the lobe. Perianth obovate, 320–480 x 200–220 µm, with a one cell row high, 15–20 µm long beak and with two larger dorsal and with one obtuse ventral carenae. The whole outer surface of bracts and of the perianth, similarly to the dorsal side of leaves, ciliately hirsute. Sporophyte rare, young capsule subglobose, of 105 µm diameter.

Differential diagnose: The new species is obviously related to *Cololejeunea kalombangerae* Pócs, known from Papua New Guinea and Solomon Islands (Pócs 2011) and to *Cololejeunea konratii* Pócs, from the Fiji Islands (Pócs 2012). The lobuli of the three species are similar to each other. But *C. ramromensis* is well distinguishable from the two other species by its much longer marginal and dorsal ciliae. In addition, its lobes are 18–23 cells



Figures 5-10. *Cololejeunea ramromensis* Pócs, sp. nov. 5 – Shoot, ventral view; 6 – Gynoecium; 7–8 – leaves, ventral view; 9 – Shoot, dorsal view; 10 – Leaf, dorsal view. SEM micrographs from the isotype [scale bars in µm].

wide while in the other two species only 12–14 cells wide. Instead of the long ciliae of the new species their dorsal lobe side has only relatively short papillae.
Distribution: At present it is known only from the type locality in southern Thailand.

Enumeration of taxa new to Thailand or Indochina

Remark: Citations of plant name authors follow Brummitt & Powell (1996).

***Cheilolejeunea lindenbergii* (Gottsche) Mizutani, 1979**
= *Cheilolejeunea luerssenii* (Stephani) Mizutani 1967
Localities: Nakhon Si Thammarat Prov.: Summit of Mt. Khao Ramrome 8 km NW of Ron Phibun town, on a sharp ridge behind the telecommunication tower, at 930-945 m alt. 08°14.28'N, 99°48.32"E. Mossy montane rainforest, on bark. Coll.: *T. Pócs, S. Chantanaorrapint & G.E. Lee 1209/D*. A species characterized by its very broad, emarginate or shallowly incised underleaves and by the high dorsal mammillae of the leaves.
Known distribution: Sri Lanka, Bangladesh, Indonesia and Malaysia (Kitagawa 1969), Fiji Islands (Pócs et al. 2011).

***Cheilolejeunea ryukyuensis* Mizutani, 1982**
Localities: Songkhla Prov.: Tone Nga Channg waterfall area 25 km WSW of Hat Yai town, at 120-180 m alt. 06°56.85'N, 100°14.06'E. Rocky hill rainforest, on bark. Coll.: *T. Pócs & G.E. Lee 1207/A*; Nakhon Si Thammarat Prov., Sichon Distr.: Nam Tok Sikiet Nat. Park, Si Keed Waterfalls area at 100 m alt. 09°00'N, 99°46.32'E. Often inundated lowland rainforest on limestone ground, along streamlet with travertine cataracts, on bark. Coll.: *T. Pócs & S. Somadee 1220/B*. The species is distinguished from the related *Ch. intertexta* by its orbicular leaf lobe and the presence of flagelliform branches.
Known distribution: China: Hong Kong and Japan: Ryukyu Islands (Zhu & So 2001).

***Cololejeunea dankiaensis* Tixier, 1969**
Localities: Mt. Khao Ramrome, see No. 1, epiphyll. (For saving space, we do not repeat already given localities, just refer to the serial number of species, where it is described in details). Coll.: *T. Pócs, S. Chantanaorrapint & G.E. Lee 1209/AD*.
Known distribution: S Vietnam, Cambodia (Tixier 1969).

***Cololejeunea diaphana* A. Evans, 1905** (Fig. 11)
Localities: Nakhon Si Thammarat Prov.: Khao Luang Nat. Park, Karome Waterfalls on the S slopes, at 200-300 m alt. 08°22.37'N, 99°42.00'E. Hill rainforest on the E side of the falls, epiphyll. Coll.: *T. Pócs 1223/AB*.
Known distribution: Pantropical.

***Cololejeunea ensifera* Tixier, 1969** (Fig. 12)
Localities: Mt. Khao Ramrome, see No. 1, epiphyll. Coll.*: T. Pócs, S. Chantanaorrapint & G.E. Lee 1209/AF, 1209/JB*.
Known distribution: S-Vietnam, Cambodia (Tixier 1969).

***Cololejeunea inflectens* (Mitten) Benedix, 1953** (Fig. 13)
Localities: Mt. Khao Ramrome, see No. 1, epiphyll. Coll.: T. *Pócs, S. Chantanaorrapint & G.E. Lee 1209/AA*; Nakhon Si Thammarat Prov.: Summit of Mt. Khao Ramrome 8 km NW of Ron Phibun town, on a sharp ridge around Khao Ramrome Resort at 930-940 m alt. 08°14.18'N, 99°48.182'E. Montane rainforest, on twigs. Coll.: *T. Pócs & G.E. Lee 1213/Y*; Nakhon Si Thammarat Prov.: Mt. Khao Lek, abandoned iron mines near Huai Phan village, at 220 m alt. 08°46.56'N, 99°43.41"E. Remnants of see mist effected hill rainforest, epiphyll. Coll.: *T. Pócs, G.E. Lee & K. U-Taynapuh 1216/P*.
Known distribution: Palaeotropical species, from Madagascar and Seychelles to Fiji Islands (Pócs et al. 2011).

***Cololejeunea kulelensis* Tixier, 1985**
Localities: Nakhon Si Thammarat Prov.: Pliu (Plew) Waterfall area 9 km E of Thung Song town, at 185-212 m alt. 08°09.78'N, 99°45.59'E. Primary hill rainforest in a rocky stream valley dominated by *Quercus* and *Castanopsis* spp., epiphyll. Coll.: *T. Pócs & G.E. Lee 1211/AN*.
Known distribution: Sumatra, Cambodia, Peninular Malaysia and Fiji (von Konrat et al. 2010; Pócs et al. 2011).

***Cololejeunea latilobula* (Herzog) Tixier, 1985** (Fig. 14)
Localities: Nakhon Si Thammarat Prov.: Klong Jang Waterfalls on the W slope of KHAO MEN Mt. at 150 m alt. 08°16.24'N, 99°38.67'E. Hill rainforest around the falls, on granitic rocks. Coll.: *T. Pócs & S. Somadee 1218/A,1218/AC*.
Known distribution: Widespread Palaeotropical species distributed all over Africa, Asia and the Pacific.

Cololejeunea madothecoides **(Stephani) Benedix, 1953**
Localities: Nakhon Si Thammarat Prov.: Krung Ching Waterfall area (annex of Khao Luang National Park) near Phi Tam village, at 160-240 m alt. 08°43.41'N, 99°40.09'E. Wet hill rainforest below the falls, on bark of *Homonoia riparia* (Euphorbiaceae) bush on the streambed rocks. Coll.: *T. Pócs, G. E. Lee & K. U-Taynapuh 1217/J*.
Known distribution: India, Bhutan, Vietnam, Japan, Sumatra, Java, Borneo, New Guinea (Asthana & Srivastava 2003; Pócs & Piippo 2011).

Cololejeunea pacifica **Pócs, 2012** (Fig. 15).
Localities: Mt. Khao Lek, see No. 3, epiphyll, Coll.: *T. Pócs, G.E. Lee & K. U-Taynapuh 1216/K*.
Known distribution: Tonga: Vaifele (Eua Island); Tahiti: Fautaua Valley near Papeete and above the petroglyph rocks of Tipiare (Hürlimann 1987: 222); Fiji: Viti Levu and Kadavu Islands (Pócs 2012). It is new to the whole Indomalesia and Asia. *C. pacifica* and *C. cardiocarpa* form an interesting vicariant pair of related, allopatric species. *Cololejeunea cardiocarpa* is very widespread in the Neotropics and in Africa and occurs in Eastern Australia and New Caledonia as well never overlapping in its distribution with the Pacific and Asian *C. pacifica*.

Cololejeunea paucimarginata **Tixier, 1985** (Fig. 16)
Localities: Tone Nga Chang waterfall area, see No.2, on streambed rocks, Coll.: *T. Pócs & G.E. Lee 1207/E*; Nakhon Si Thammarat Prov.: In the rocky stream valley below the Pliu Waterfalls 8 km E of Thung Song town, at 140-160 m alt. 08°09.50'N, 99°45.36'E. Secondary rainforest. Coll.: *T. Pócs & G.E. Lee 1212/D*.
Known distribution: Hitherto considered to be an endemic of Java (Tixier 1985).

Cololejeunea raduliloba **Stephani, 1895** (Fig. 17)
Localities: Songkhla Prov.: Ban Huare village area 22 km WSW of Hat Yai town, at 50 m alt. 06°57.20'N, 100°16.12'E. Stream side in a rubber plantation replacing former lowland rainforest, on rocks. Coll.: *T. Pócs & G.E. Lee 1208/D*; Pliu Waterfalls, see No. 13, on streambed rocks. Coll.: *T. Pócs & G.E. Lee 1212/P*.
Known distribution: Plaeotropical species distributed from the Seychelles and Madagascar through Indonesia and China to Australia, New Caledonia, Fiji and Caroline Islands (von Konrat et al. 2010; Pócs et al. 2011).

Cololejeunea spathulifolia **(Stephani) Tixier, 1985** (Fig. 18)
Localities: Pliu Waterfall area, see No. 7, epiphyll.
Known distribution: Réunion, Vietnam, New Caledonia and Hawaii (Tixier 1985).

Cololejeunea stephanii **Schiffner ex Benedix, 1953** (Fig. 19)
Localities: Mt. Khao Ramrome, see No. 1, epiphyll. Coll.: *T. Pócs, S. Chantanaorrapint & G.E. Lee 1209/AE*.
Known distribution: Java, Sumatra, Malaysia, Sabah, Philippines: Mindanao (Tixier 1978); China: Hainan, New Guinea (Zhu 1995).

Colura brevistyla **Herzog, 1921** (Fig. 20)
Localities: Mt. Khao Lek, see No.3. Coll.: *T. Pócs, G.E. Lee & K. U-Taynapuh 1216/M*.
Known distribution: Sri Lanka, Philippines, Mariana and Fiji Islands (Pócs et al. 2011).

Colura leratii **(Stephani) Stephani, 1916** (Fig. 21)
Localities: Pliu Waterfalls, see No. 13, epiphyll. Coll.: *T. Pócs & G.E. Lee 1212/Q*.
Known distribution: Indomalesian-Pacific species widespread from India to New Caledonia and Fiji. (Pócs & Eggers 2007).

Colura ornata **K.I. Goebel, 1891** (Figs 22-23)
Localities: Krung Ching Waterfall, see No. 11. Wet hill rainforest below the falls, epiphyllous. Coll.: *T. Pócs, K. U-Taynapuh 1217/AE, 1217/AH*. (Fig. 22). Noticeable are the peculiar shaped, more than 50 celled gemmae of this species, observed for the first time (see fig. 23), with their four adhesive cells.
Known distribution: Java, Peninsular Malaysia, Borneo, Philippines: Luzon, China (Jovet-Ast 1954; Piippo 1990).

Colura pallida **Stephani, 1916** (Figs 24-25)
Localities: Khao Ramrome summit area, see No. 1, epiphyllous and 7, on bark. Coll.: T. Pócs, S. Chantanaorrapint & G.E. Lee & K. U-Taynapuh 1209/AY, 1213/M. The gemmae of this species were observed as round, consisting of approximately 40 cells (fig. 24).
Known distribution *of C. pallida:* It was considered to be an endemic of New Guinea (Jovet-Ast 1954).

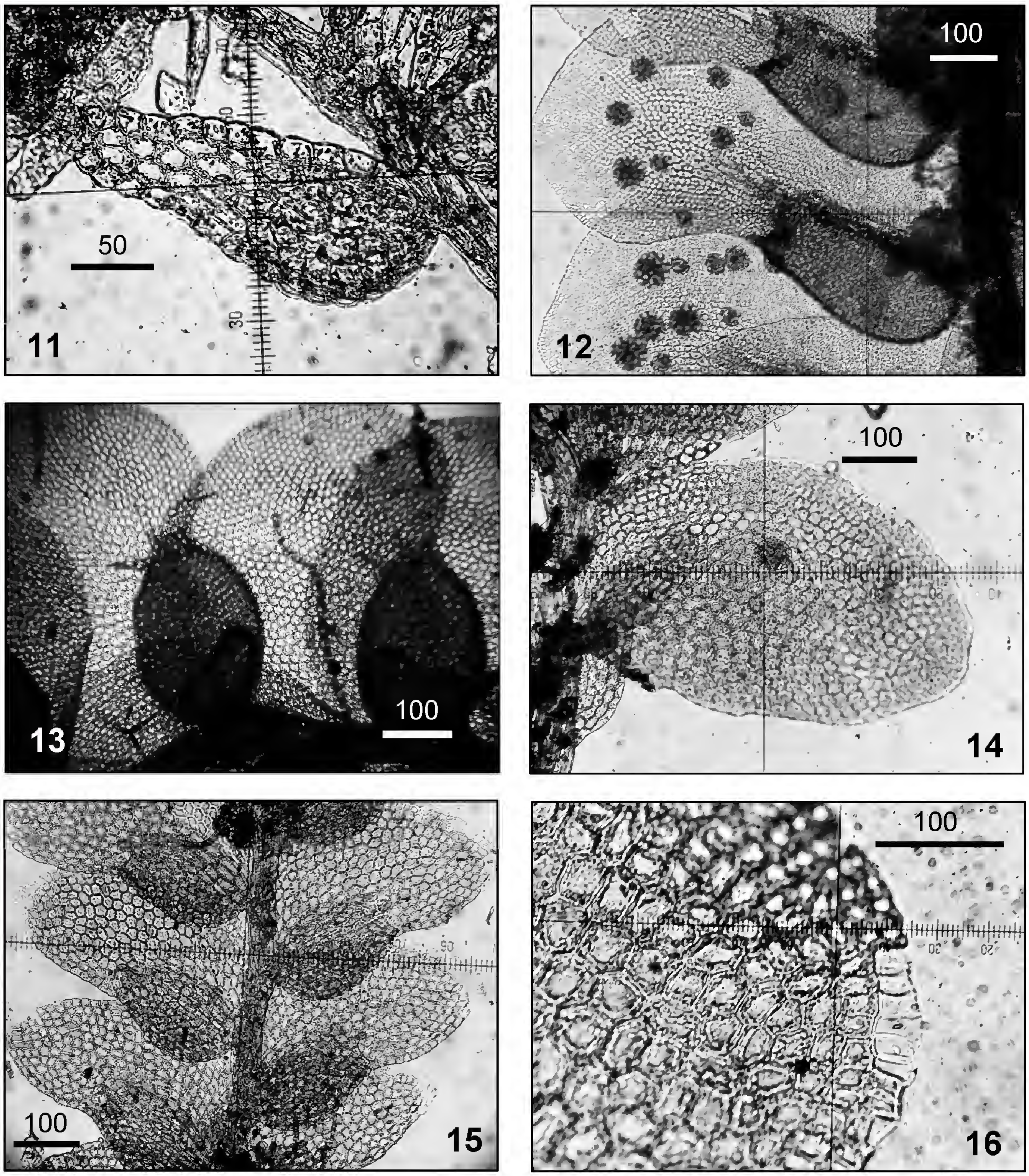
Lepidolejeunea graeffei **(Jack, Stephani) R.M. Schust, 1980**
Localities: Nam Tok Sikiet Nat. Park, see No. 2, on bark. Coll.: *T. Pócs & S. Somadee 1220/BB,*

1220/O.

Known distribution: Indonesia, Philippines, New Guinea, Solomon Islands, New Caledonia, Vanuatu, Caroline, Fiji, Samoa (Piippo 1986; Thouvenot et al. 2011).

Leptolejeunea subrotundifolia **Herzog, 1942** (Figs 26-28)

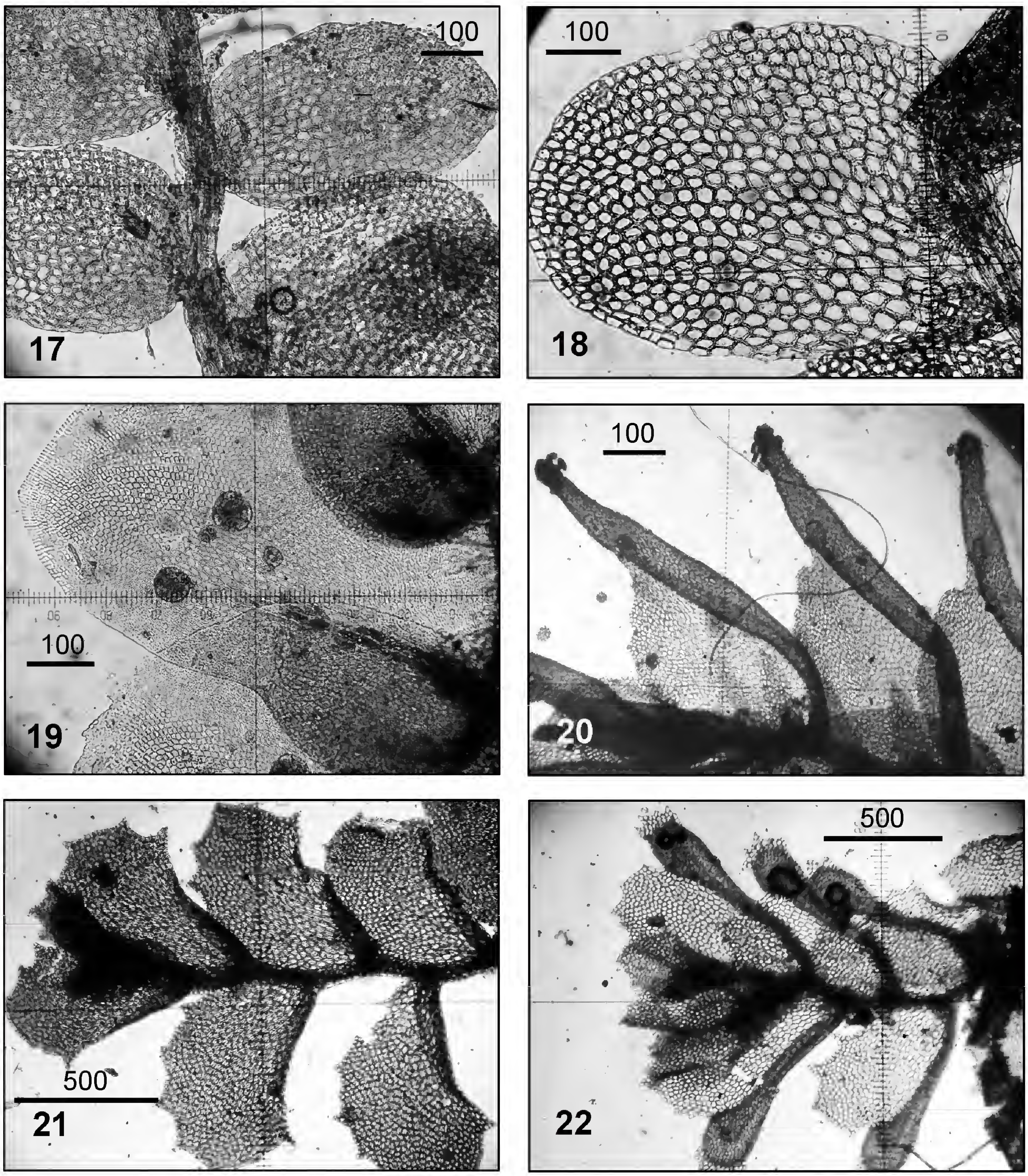
Localities: Krabi Prov.: Sa Morakot (Crystal Pool) Reserve, 5 km SE of Klong Thom Nuea, at 70 m alt. 07°55.92'N, 99°16.20'E. Open woodland on travertine banks of "Emerald Pool" formed by *Madhuca malaccensis* (C.B. Clarke) H.J. Lam (Sapotaceae)



Figures 11-16. *Cololejeunea* species. 11 – *Cololejeunea diaphana* A. Evans, leaf,ventral view, no.1223/AB; 12 – *Cololejeunea ensifera* Tixier, leaf, ventral view, no. 1209/JB; 13 – *Cololejeunea inflectens* (Mitt.) Benedix, laf, ventral view, no. 1213/Y; 14 – *Cololejeunea latilobula* (Herz.) Tixier, leaf, ventral view, no. 1218/A; 15 – *Cololejeunea pacifica* Pócs, shoot, ventral view, no. 1216/K; 16 – *Cololejeunea paucimarginata* Tixier, lobe apex, no. 1207/E [scale bars in μm].

trees and masses of *Pteris* sp. in the undergrowth. On bark of *Rademachera pinnata* (Blanco). Coll.: *T. Pócs & S. Somadee 1228/C*. The gynoecium of this species was observed the first time (see fig. 27), as the type specimen of this dioicous plant has only androecia.
Known distribution: only the type locality in Kalimantan Barat (Herzog 1942), also from bark. Most of the other *Leptolejeunea* species are epiphyllous.

Radula **cf. *kinabaluensis* Yamada, 1973**
Localities: Khao Ramrome, see No. 1, epiphyllous. Coll.: *T. Pócs, S. Chantanaorrapint & G.E. Lee 1209/U*.



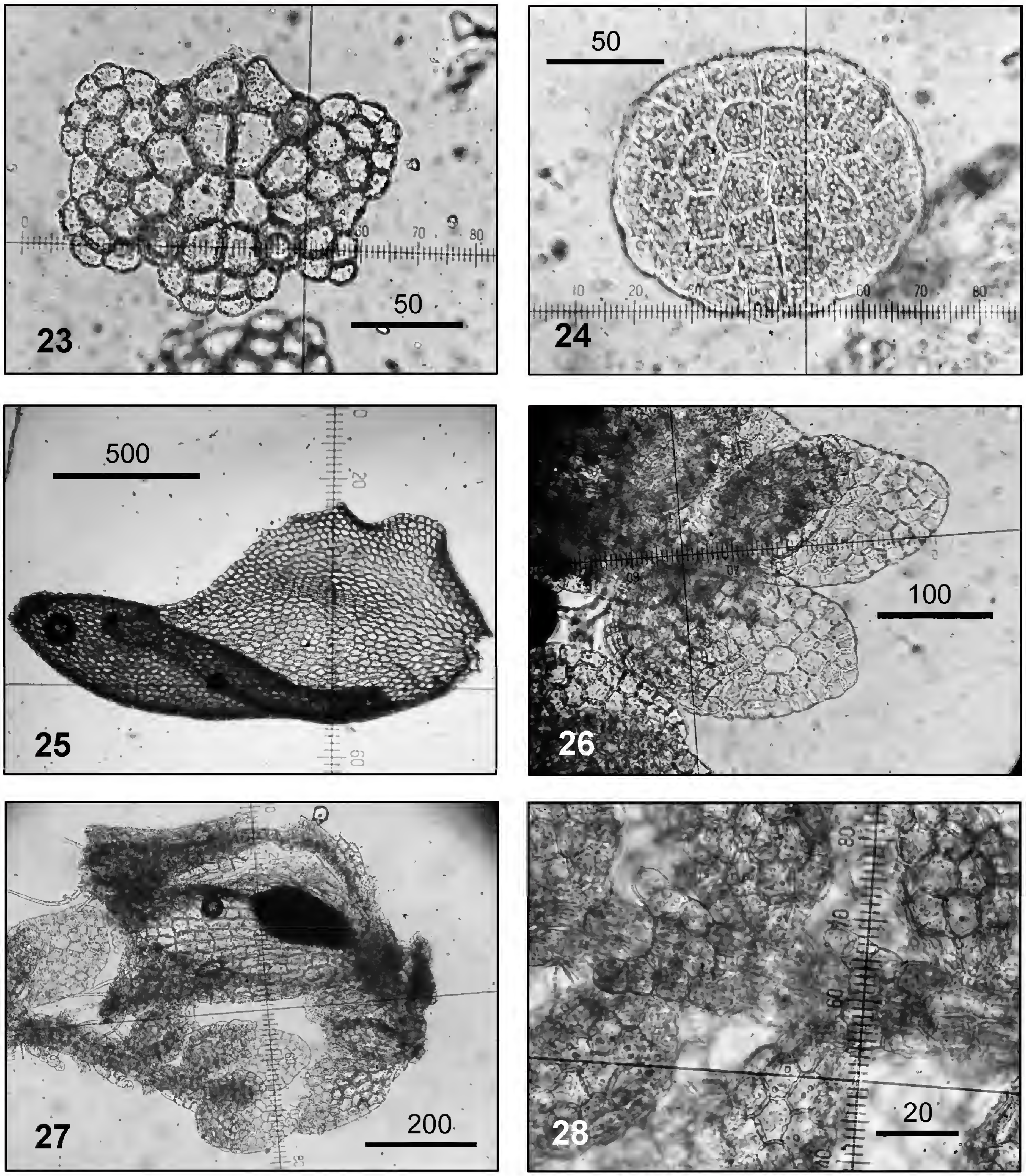
Figures 17-22. *Cololejeunea* and *Colura* species. 17 – *Cololejeunea raduliloba* Steph., shoot, ventral view, no. 1208/D; 18 – *Cololejeunea spathulifolia* (Steph.) Tixier, leaf, ventral view, no. 1211/AO; 19 – *Cololejeunea stephanii* Schiffn. ex Benedix, leaf, ventral view, no. 1209/AE.; 20 – *Colura brevistyla* Herz., shoot, ventral view, no. 1216/M; 21 – *Colura leratii* (Stzeph.) Steph., shoot, ventral view, no. 1212/Q; 22 – *Colura ornata* K.I. Goebel, shoot, ventral view, no. 1217/AH [scale bars in μm].

Known distribution: Hitherto considered to be endemic to Borneo: Mt. Kinabalu (Yamada 1979).

Radula protensa **Lindenberg, 1848**

Localities: Krabi Prov.: Sa Morakot (Crystal Pool) Reserve, 5 km SE of Klong Thom Nuea, at 60-70 m alt. 07°55.45'N, 99°15.66'E. Swamp forest along streamlet with travertine banks, on bark. Coll.: *T. Pócs & S. Somadee 1227/E*.

Known distribution: Indomalesian species distributed from India to south China, Philippines and New Guinea (Yamada 1979).



Figures 23-28. *Colura* and *Leptolejeunea* species. 23 – Gemma of *Colura ornata* K.I. Goebel, no. 1217/AH; 24 – Gemma of *Colura pallida* Steph., no. 1209/AY; 25 – *Colura pallida* K.I. Goebel, leaf, ventral view, no. 1209/AY; 26–28 – *Leptolejeunea subrotundifolia* Herz. no. 1227/E; 26 – shoot, ventral view; 27 – Gynoecium; 28 – Underleaves [scale bars in µm].

Discussion

Although a full phytogeographical analysis of Thai bryoflora is at the present level of our knowledge cannot be done, some approach was made by Lai et al. (2008), counting the generic similarity to China is 75.6%, to Borneo 72.7% and to Japan 72.5%. Obviously this is a generalised picture and the northern half of the country shows more affinity to the Sino-Japanese flora while the southern half to the Malesian one. This fact is reflected even in the distributional data of the above new records, of which *Cheilolejeunea lindenbergii* (Gottsche) Mizutani, *Cololejeunea kulelensis* Tixier, *C. madothecoides* (Stephani) Benedix, *C. stephanii* Schiffner ex Benedix, *Colura brevistyla* Herzog, *C. leratii* (Stephani) Stephani, *C. ornata* K.I. Goebel, *C. pallida* Stephani, *Lepidolejeunea graeffei* (Jack, Stephani) R.M. Schust, and *Leptolejeunea subrotundifolia* Herzog have Malesian–Pacific affinities. Noticeable are the very disjunct occurrence of a few species of this kind, like *Cololejeunea pacifica* Pócs, *C. paucimarginata* Tixier and that of *Leptolejeunea subrotundifolia* Herzog. The number of Indochinese endemic species is considerable, *Cololejeunea dankiaensis* Tixier, *C. ensifera* Tixier and *Cololejeunea ramromensis* Pócs sp. nov. [described above] can be classified in this group. On the other hand, only *Cheilolejeunea ryukyuensis* Mizutani can be considered as a taxon of Sino-Japanese affinity and the rest of the species are more widespread. If we compare the above 23 new records to the known number of Thai liverworts (386), we can agree with the statement of Lai et al. (2008), that many of the liverwort taxa are still waiting for discovery in Thailand.

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A new scansorial species of *Platymantis* Günther, 1858 (Anura: Ceratobatrachidae) from Manus Island, Admiralty Archipelago, Papua New Guinea

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Abstract: Recent surveys and examination of museum specimens have revealed at least seven new species of frogs from the remote Admiralty Archipelago off northern Papua New Guinea. This includes six species of the genus *Platymantis* Günther, 1858 (Family Ceratobatrachidae) of which three, *Platymantis admiraltiensis* Richards, Mack, Austin, 2007, *P. latro* Richards, Mack, Austin, 2007 and *P. manus* Kraus, Allison, 2009 have been described since 2007. Here we describe an additional species of *Platymantis* from Manus Island in the Admiralty Archipelago. The new species is most similar morphologically to *Platymantis macrosceles* Zweifel, 1975 and *P. citrinospilus* Brown, Richards, Broadhead, 2013 both from New Britain Island in the Bismarck Archipelago, in having greatly expanded finger and toe discs and a slender body form, but differs from both of those species in a suite of morphological and acoustic characters. Frog diversity on Manus Island is high for such a small and isolated oceanic island group, and is considerably higher than the nearby and much larger New Ireland.

Key words: Amphibia, frog, new species, Ceratobatrachidae, Manus Province, New Guinea.

Introduction

Isolated oceanic islands are characterized by relatively depauperate frog faunas, a reflection of the poor over-sea dispersal ability of most frogs (Zug 2013). Melanesian islands to the north and east of New Guinea are notable exceptions, having moderately diverse ceratobatrachid frog assemblages (e.g. Brown 1952; Foufopoulos & Brown 2004; Brown et al. 2006a & b; Foufopoulos & Richards 2007; Kraus & Allison 2007; Brown et al. 2013).

The Admiralty Archipelago is situated approximately 275 km north of mainland Papua New Guinea. The largest and highest island in the group is Manus, with an area of approximately 2 020 km^2 and reaching 719 m elevation. Collections from the archipelago in the early twentieth century obtained specimens of at least four frog species (Brown 1997) but despite the archipelago's isolation only one of these, *Discodeles vogti* (Hediger, 1934), was until recently recognized as endemic (Allison 1996; Brown 1997). However, the presence of additional undescribed species was hinted at by Brown (1997) who mentioned an unnamed *Platymantis* Günther species from the Admiralties, but provided no further information about it.

A short survey in northern Manus Island by the senior author during 2002 and additional recent material obtained from Manus and several smaller islands in the archipelago revealed that the frog fauna is far more diverse than has previously been recognized. Based on these collections Richards et al. (2007) described two new species of *Platymantis*, *P. admiraltiensis* and *P. latro*, both of which appear to be endemic to the Admiralty Archipelago. Subsequently Kraus and Allison (2009) described *P. manus* based on older material found in the Museum of Comparative Zoology.

Here we describe an additional new species of *Platymantis* from Manus Island.

Material and methods

Field surveys were conducted on Manus Island between 4-10 June 2002. Collecting localities are illustrated in Fig. 1. Frogs were located along forest trails using head-torches and by tracking advertisement calls. Voucher specimens were fixed in 10% formalin and stored in 70% ethanol. Liver tissues from exemplars of all species were removed and stored in 95% ethanol prior to specimen fixation in formalin. New material is deposited in the South Australian Museum, Australia (SAMA) and the Papua New Guinea National Museum (PNGNM). Measurements (to the nearest 0.1 mm) were taken with dial calipers and a stereomicroscope fitted with an ocular micrometer. They are: snout-vent length (SVL), tibia length (TL), head width at the angle of the jaws (HW), head length as a straight-line distance from posterior of tympanum to tip of snout (HL), horizontal eye diameter (EYE), inter-narial distance (IN) to proximal edge, not centre of naris, eye-naris distance (EN), width of 3rd finger disc at right angle to digital axis (3FD) and width of penultimate phalanx of 3rd finger (3FP), width of 1st finger disc (1FD) and penultimate phalanx (1FP), and of 4th toe disc (4TD) and penultimate phalanx (4TP), as for 3rd finger. Vocalisations were recorded with a Sony TCM 5000 tape recorder and Sennheiser ME-66 microphone, and were analysed with the sound analysis program Avisoft SAS-Lab Pro.

Comparative material from the following institutions was examined. Abbreviations follow Sabaj Pérez (2013): American Museum of Natural History (AMNH), Bishop Museum, Hawaii (BPBM), California Academy of Sciences (CAS and CAS-SU), Museo Civico di Storia Naturale di Genova (MSNG), Museum of Comparative Zoology at Harvard University (MCZ), Natural History Museum, London (BM), South Australian Museum, Adelaide (SAMA), Papua New Guinea National Museum (PNGNM), United States National Museum (USNM), the Texas Natural History Collection of the University of Texas at Austin (TNHC), the University of Wisconsin Zoology Museum (UWZM), the University of Kansas (KU), and Natural Sciences Resource Collection at the University of Papua New Guinea (UPNG). Additional meristic and morphological data were taken from Foufopoulos & Brown (2004). Species in the diverse Philippines radiation of *Platymantis* do not occur in Melanesia so comparisons presented below are restricted to Melanesian taxa. Coordinates of sites use the GPS datum WGS-84.

FN = Field number abbreviations are as follows: ALM = field collection of Andrew L. Mack, CCA = field collection of Christopher C Austin, JCU = James Cook University (field collection of S.J. Richards).

Description of new species

Platymantis custos **sp. nov.** (Figs 2-3, plate 1)

Holotype SAMA R 63525 (FN = JCU 2654), Chachuau Camp near Tulu 1 Village, Manus Island, Papua New Guinea (2°01.089' S, 146°47.807' E) collected on 10 June 2002 by S. Richards.

Paratypes 21 specimens: UPNG 10020 (FN = JCU 2614), 10021 (FN = JCU 2615), 10022 (FN = JCU 2633), 10023 (FN = JCU 2644), 10024 (FN = JCU 2652), SAMA R 63510-11 (FN = JCU 2610-11), R63512-13 (FN = JCU 2617, 2619), R 63514 (FN = JCU 2632), R63515 (FN = JCU 2634), R 63516 (FN = JCU 2636), R 63517 (FN = JCU 2651), R 63518 (FN = JCU 2653), R 63519-21 (FN = JCU 2656-58) ♂♂; UPNG 10018 (FN = JCU 2613), UPNG 10019 (FN = JCU 2612), SAMA R 63518 (FN JCU 2653) ♀♀, all collected by S. Richards at the type locality between 7-10 June 2002; SAMA R63511 (FN = JCU 2611) ♂ collected by S. Richards at Tulu 1 Village, Manus Island, Papua New Guinea (1°57.530' S, 146°50.085'E) on 6 June 2002.

Referred specimens. SAMA R 63522-23 (FN = ALM 1369-70), Natnewai Camp, about 3.7 km NNE of Patu Mission, Manus Island (approximately 02°10'S, 147° 02'E) collected by A. Mack on 29 April 2001, SAMA R 63524 (FN = CCA 2060), Tingau Village, 27 km from Lorengau, Manus Island (02°05.76'S, 147° 06.33'E) on 30 August 2001.

Derivatio nominis: From the Latin custos = 'guardian', referring to the egg-guarding behaviour by males of this species.

Diagnosis: A moderately small (males 25.9-31.4 mm, females 29.3-32.8 mm), extremely slender species that can be distinguished from congeners by the following combination of characters: 1) discs on fingers and toes prominent, 2) limbs extremely long, slender (TL/SVL 0.54-0.65), 3) snout narrow, acuminate, protruding distinctly beyond lower jaw, 4) tubercles on dorsum and tibiae small but prominent in life, 5) tubercle above eye only moderately developed, 6) dorsum brown, without reticulate pattern and 7) advertisement call a long, unmusical note train containing 632 notes uttered at a rate of 9-16 notes/s and lasting 13 s. Dominant frequency ranged from 3603 to 4317 Hz across the 19 calls analyzed.

Description of holotype: Adult male with vocal slits, calling when collected. Habitus very slender, elongate; head moderately narrow (HW/HL = 0.34) but distinctly wider than body; snout long, with distinctly pointed tip in dorsal aspect, slightly rounded, nearly truncate in lateral aspect (Fig. 2); upper jaw protrudes distinctly beyond lower jaw, labial region flared and sloping; interorbital region and dorsal surface of snout flat, without saggital crest. Canthus rostralis marginally curved with distinct outwards bow just prior to eyes; loreal region steep, deeply concave. Nares much closer to tip of snout than to eyes, positioned just below canthal ridge, oriented laterally and visible in dorsal view. Choanae small and ovoid, separated by a distance approximately four times their diameter. Two prominent, roughly triangular bundles of vomerine teeth located marginally posterior to and medial of the choanae, their anterior edges separated by a distance roughly 3–4 times the diameter of the choanae and their posterior edges separated by a distance approximately 2 times the diameter of the choanae. Tongue lanceolate with very pointed anterior tip and bifid posterior edge. Eyes moderately large (EYE/SVL = 0.12), bulbous, protruding significantly in dorsal view and marginally in lateral view, without tubercles dorsally; pupil horizontal. Tympanum moderately small (EAR/SVL = 0.058), tympanic annulus clearly visible except dorsal edge that is obscured by single supratympanic fold extending from posterior edge of orbit to supra-axial region. Skin without other dermal folds; dorsum, throat and ventral surfaces of limbs smooth, belly coarsely granular. Prominent spiniform, post-rictal tubercles at terminal edge of lower jaw, and small low indistinct tubercles in rictal region, on posterior edge of tarsus, in scapular region and around vent. Limbs long (TL/SVL = 0.56) and slender. Fingers long, unwebbed, with very large truncate terminal discs (3FP/3FD = 0.25) (Fig. 2); disc on finger I greatly reduced; relative lengths III>IV>II>I; subarticular tubercles prominent, round, one under digits I-II, two under digits III-IV, supernumerary tubercles present at base of digits III-IV; inner metatarsal flat, oval and elongate, outer metatarsal divided into large almost circular medial tubercle and much smaller (one third size) elongate rounded outer tubercle. Toes long, unwebbed, relative lengths IV>III>V>II>I); toe IV very elongate, approximately twice length of III; toe I very short; terminal discs expanded (4TP/4TD = 0.46) on all digits except I; subarticular tubercles prominent, one on toes I-II, two on III-V and three on IV; inner metacarpal tubercle long, ovoid and slightly raised; medial tubercle low, indistinct and almost circular, approximately half length of inner tubercle; outer tubercle approximately half size of inner tubercle, prominently raised and round.

Colouration in preservative: dorsum pale grey-brown, with numerous tiny darker brown maculations, particularly dense around the supratympanic fold, nares and posterior edge of the hindlimbs, eyes distinctly darker; ventral surfaces off white with scattered brown maculations, particularly on throat, forelimbs and hindlimbs. Colouration in life similar, dorsum being slightly more vividly, but still uniformly, grey-brown.

Measurements of holotype (in mm): SVL = 30.9, TL = 17.4, EN = 3.8, IN = 2.2, HW = 10.5, HL = 11.5, EYE = 3.7, EAR = 1.8, 4TD = 1.1, 4TP = 0.5, 3FD = 2.0, 3FP = 0.5, 1FD = 0.9.

Variation in the type series: In preservative dorsal colouration is highly variable, varying through shades of dark brown to grey brown; three specimens (UPNG 10023-24, SAMA R63520) have a sharply defined off white dorsal stripe and one specimen has wide dorsal blaze of grey brown. Many specimens have faint barring on both hind and forelimbs. Ventral surfaces always have a base colour of off-white, however there are varying levels of brown maculations on the legs and throat, ranging from almost absent, especially on throat, to very heavily mottled with brown. The four females available are on average slightly larger than the males, but the ranges overlap significantly and the sexes are very hard to differentiate without internal investigation (♂♂ 25.9-31.14 mm, mean = 29.2 mm; ♀♀ 29.3-32.8 mm, mean = 30.9 mm). Measurements and proportions of the type series are presented in Table 2.

Colouration in life: Based on photographs of several individuals in life the dorsum is always a shade of brown, ranging from pale brown to olive brown or yellowish-brown, and the skin may be somewhat transluscent ventrolaterally. There may be cream spots along the lower lip and laterally on the body, and a narrow brown line from the snout through the nostril to the eye. SAMA R63516 was olive brown in life with a pale yellow mid-dorsal line from the snout to the vent and pale yellow patches laterally on the snout and dorsum. There are yellowish brown and pale brown patches dorsally, and a narrow dark brown bar from snout to eye separates yellow in the loreal region from olive brown colouration dorsally on the snout. Hidden surfaces of the thighs are transluscent. The iris is pale brown.

Advertisement call: The call of this species is a rapidly produced train of 6-33 rather harsh notes lasting 0.5-3 seconds. Notes are 0.01-0.03 s long and uttered at a rate of 9-16 notes/s. Dominant frequency is 3603-4317 Hz. Inter-note interval is generally slightly longer at the start of each call, which then 'stabilises' to a relatively consistent call rate. Structural details of 19 calls from three males are summarized in Table 1 and a single call is illustrated in Fig. 3. The impression from observing males calling in the field was that shorter calls were often terminated due to disturbance, or were 'start-up' calls.

Behaviour: Males of this species called from elevated positions between approximately 0.5-2 m above the ground on leaves in rainforest between sea level and the summit of Mt. Dremsel (719 m), the highest point on Manus. The new species was encountered in relatively undisturbed primary forest and also on the edges of gardens around villages. Several males were observed guarding eggs on the surface of leaves (Plate 1). At most sites where it was encountered it occurred in sympatry with *Platymantis admiraltiensis* Richards, Mack, Austin, 2007, *P. latro* Richards, Mack, Austin, 2007, *P. manus* Kraus, Allison, 2009, and two undescribed species of *Platymantis*. The ecology of this species is currently the subject of a detailed study (Taitibe and Richards, unpublished data).

Differential diagnoses: *Platymantis custos* is most similar to (and likely most closely related to) three shrub frogs known only from the Nakanai Mountains of New Britain island in the Bismark Archipelago: *P. citrinospilus* Brown, Richards, Broadhead, 2013, *P. macrosceles* Zweifel, 1975 and *P. mamusiorum* Foufopoulos, Brown, 2004. These are the only other species in the Melanesian region to have a combination of moderate size, slender body form and widely expanded finger and toe discs (Foufopoulos & Brown 2004; Brown et al. 2013). *Platymantis custos* differs from *P. citrinospilus* in never having brick reddish-

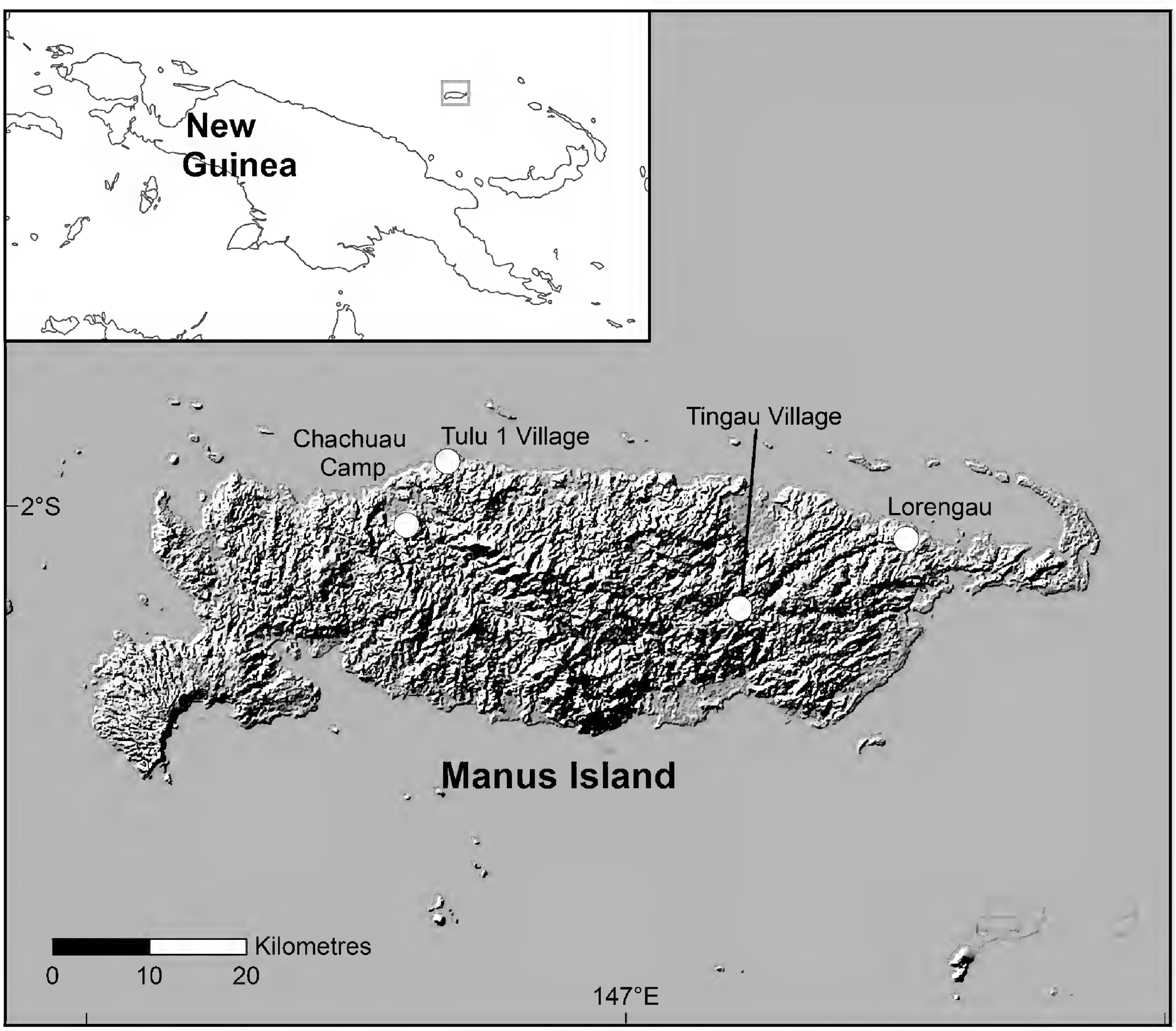

Figure 1. Map of Manus Island showing collection localities for *Platymantis custos* sp. nov.

brown ground colouration with bright yellow flank areolations, in lacking a distinct mid-saggital crest (both present in *P. citrinospilus*), and in its much more elongate and protruding snout. It differs from *P. macrosceles* by its brown base colour (homogeneous green in *P. macrosceles*), the absence of highly enlarged, prominent supra-ocular and tarsal tubercles (present in *P. macrosceles*) and its more elongate and protruding snout; and from *P. mamusiorum* by its brown (vs green with fine brown reticulum) dorsum, its extremely elongate, pointed (versus rounded) snout and by its pulsed advertisement call (versus a stridulated series of "croaks" or "crunches" in *P. mamusiorum*). Of the other tree-dwelling shrub frogs of the Bismarck Archipelago, *Platymantis custos* (SVL 25.9-32.8) differs from the larger *P. nakanaiorum* (SVL 35.8-38.0) and *P. nexipus* (SVL 39.3-43.7) and the much smaller *P. browni and P. caesiops* (SVL < 27) by body size, and by its much more pointed and protruding snout (versus rounded snout) (Zweifel 1975; Allison & Kraus 2001; Foufopoulos & Brown 2004; Brown et al. 2006a; Kraus & Allison 2009). *Platymantis custos* can easily be distinguished from *P. manus* Kraus, Allison by its much narrower snout and from all terrestrial species of *Platymantis* on Manus (*P. admiraltiensis*, *P. latro*), and New Britain (*P. adiastolus* Brown, Richards, Sukumaran, Foufopoulos, 2006, *P. akarithymus,* Brown, Tyler, 1968, *P. boulengeri* (Boettger, 1892), *P. bufonulus*

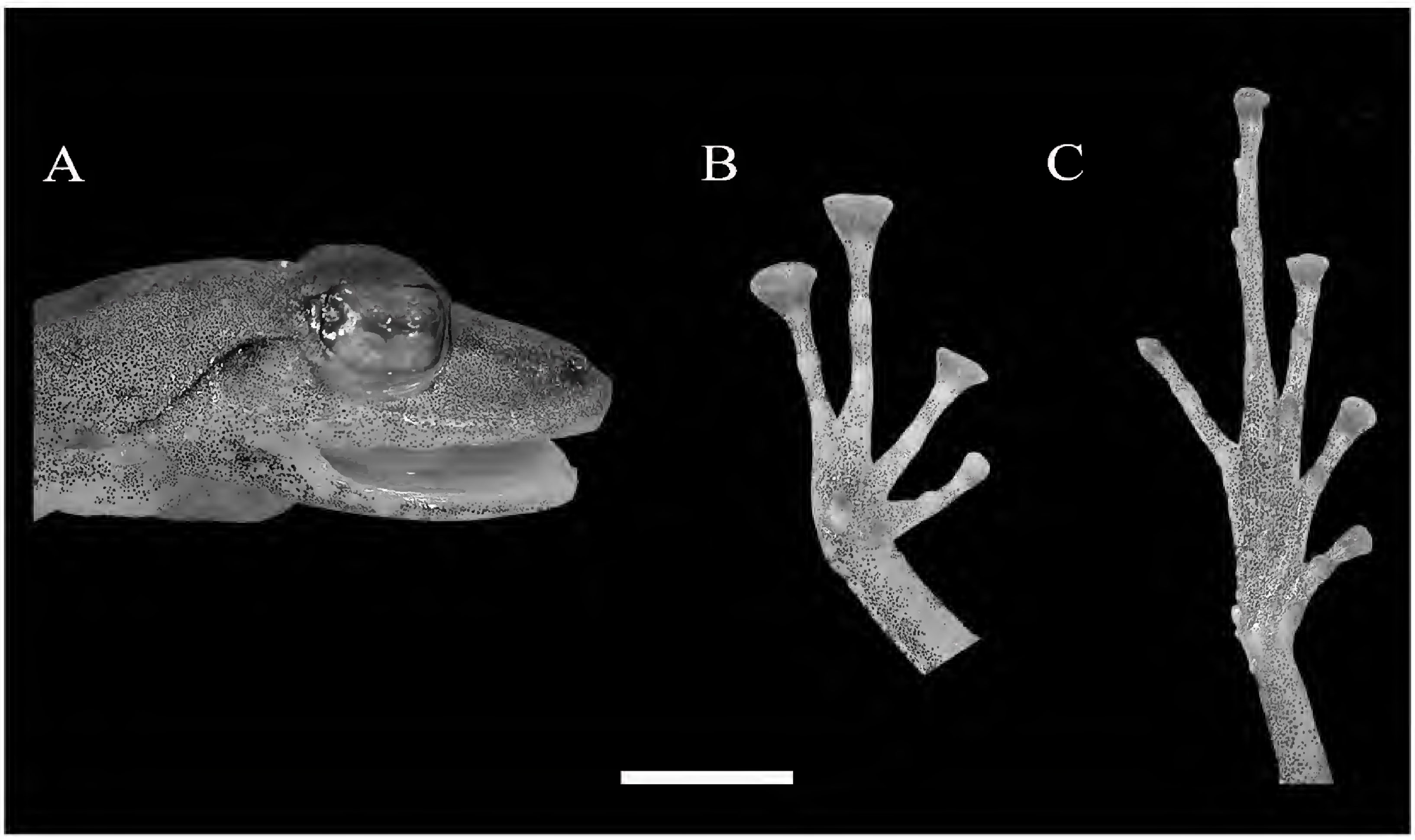

Figure 2. *Platymantis custos* sp. nov., holotype. A – Head; B – Right hand; C – Right foot (SAMA R63525) [scale bar 5 mm].

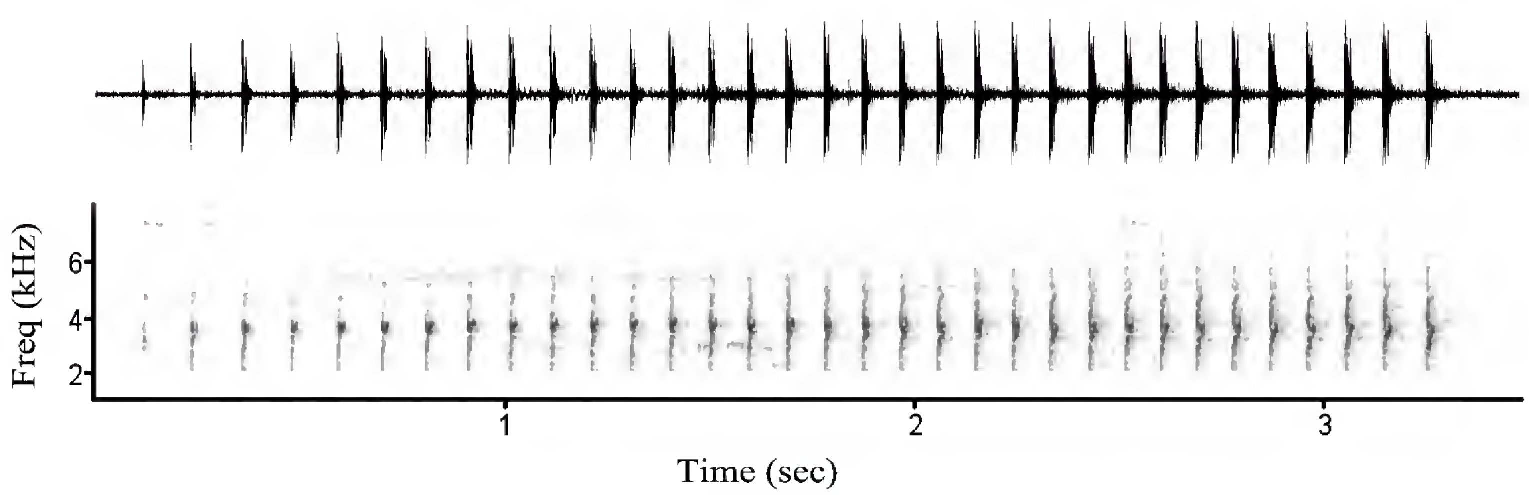

Figure 3. *Platymantis custos* sp. nov. waveform (top) and spectrogram (bottom) of a single call (SAMA R63512).

Kraus, Allison, 2007, *P. gillardi* Zweifel, 1960, *P. magnus* Brown, Menzies, 1979, *P. mimicus* Brown, Tyler, 1968, *P. schmidti* Brown, Tyler, 1968 , and *P. sulcatus* Kraus, Allison, 2007) by the presence of widely expanded digital disks of fingers and toes (versus finger and toe termini non-expanded to only slightly expanded). It differs from the other more distant Melanesian *Platymantis* species with similarly wide digital discs in its much smaller size (*Platymantis guppyi* (Boulenger, 1884), *Platymantis neckeri* (Brown and Myers, 1949), *Platymantis parilis* Brown, Richards, 2008 (Solomon Islands) and *Platymantis vitiensis* (Girard, 1853) (Fiji) are all significantly larger (> 38.6 mm for adult males)), and much more slender body form (Foufopoulos & Brown 2004).

Distribution: This species is currently known only from Manus Island, Admiralty Archipelago, Papua New Guinea (Fig. 1).

Specimens examined

***Platymantis acrochordus* (Brown, 1965)**
Material examined: 17 specimens, Solomon Islands, North Solomons, Bougainville Island, Bougainville Province, Kunua: MCZ-A 38196 (paratype); Asesi, S. of Kunua MCZ-A 41871-72, 44256-67 (paratypes); Kolopakisa Village, Isabel Island: SAMA R56300; Posarae, Choiseul Island, SAMA R56932.

***Platymantis aculeodactylus* Brown, 1952**
Material examined: 7 specimens, Solomon Islands, Bougainville Island, Bougainville Province, Kunua: MCZ-A 36961-64; KU 98475; Posarae, Choiseul Island: SAMA R56991; Barora Faa Island (near Isabel Island): SAMA R56838.

***Platymantis adiastolus* Brown, Richards, Sukumaran, Foufopoulos, 2006**
Material examined: 14 specimens, Papua New Guinea, New Britain Island, East New Britain Province, Wanui River Valley, Wanui Village: SAMA R61906 (holotype), 57014-15, R60257-59, R61907-09, UPNG 8874-76 (paratypes); East New Britain Province, Vouvou Camp: SAMA R64704, 64797.

***Platymantis admiraltiensis* Richards, Mack, Austin, 2007**
Material examined: 16 specimens, Papua New Guinea, Admiralty Islands, Manus Province, Manus Island Chachuau Camp, near Tulu 1 Village: SAMA R62799 (holotype), UPNG 10049, SAMA R62800-01, UPNG 10050, SAMA R62802-03; Lorengau: SAMA R62804-05; Tulu 1 Village: SAMA R62808-10; Tingau Village: SAMA R62806; Natnewai Camp: SAMA R62811-16; Los Negros Island, Salami Village: SAMA R62807 (paratypes).

***Platymantis akarithymus* Brown, Tyler, 1968**
Material examined: 8 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, West New Britain Province, S coast, ca 14 km NW Pomugu, Kandrian: CAS-SU 22875 (paratype); Moramora, 3 km N, 7 km E Hoskins: MCZ-A 88823; Pomugu, SAMA R7073 (holotype), SAMA R6982 (paratype); East New Britain, Malasait (04.464oS, 151.889oE), SAMA R7066, R7082; SAMA 57020-21; Papua New Guinea, East New Britain Province, Lamas Camp: SAMA R64679, 64680.

***Platymantis batantae* Zweifel, 1969**
Material examined: 5 specimens, Indonesia, Raja Ampat Islands, Batanta Island, Warinkabom: MZB 12256; Waire Camp: MZB 12258; Yakut Camp: MZB 12268; Waigeo Island, Camp near Urbinasopen: MZB 12276; Papua mainland, Manokwari, Gunung Meja: MZB 12299.

***Platymantis bimaculatus* Günther, 1999**
Material examined: 4 specimens, Indonesia, Raja Ampat Islands, Waigeo: MZB 12267, 12272, 12275, 12279

***Platymantis boulengeri* (O. Boettger, 1892)**
Material examined: 5 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, West New Britain Province, ca 40 km S of Talasea, San Remo Plantation on Willaumez Peninsula: CAS-SU 22876; "New Britain Archipelago": MCZ-A 1729, 9372; Moramora, 3 km N, 7 km E Hoskins: MCZ-A 92711; CAS-SU 22873 (paratype of *P. rhipiphalcus*), SAMA R7078 (paratype paratype of *P. rhipiphalcus*); Pomugu: SAMA R7071 (holotype of *P. rhipiphalcus*); Papua New Guinea, East New Britain Province, Vouvou Camp: SAMA R64798.

***Platymantis browni* Allison, Kraus, 2001**
Material examined: 10 specimens, New Ireland Island, Weitin River Valley, 8 km N, 7 km W of river mouth, "River Camp" (04.544°S 152.964°E), 150 m: BPBM 12090, 12099, 12102, 12104, 12106l, 12109, 12113, 12115, 12188, 12191 (paratypes).

***Platymantis bufonulus* Kraus, Allison, 2007**
Material examined: 1 specimen, Papua New

Guinea, New Britain Island, East New Britain Province, Vouvou Camp: SAMA R64805.

***Platymantis caesiops* Kraus, Allison, 2009**
Material examined: 2 specimens, Papua New Guinea, New Britain Island, East New Britain Province, Vouvou Camp: SAMA R10730, 10732.

***Platymantis cheesmanae* Parker, 1940**
Material examined: 3 specimens, Indonesia, Cyclops Mountains, Wambena Camp: SJR 6212, 6201, 6204.

***Platymantis citrinospilus* Brown, Richards, Broadhead, 2013**
Material examined: 4 specimens, Papua New Guinea, New Britain Island, East New Britain Province, Nakanai Mountains, Tompoi Camp, 1700 m above sea level: SAMA R64758 (holotype), SAMA R64756, R64757, PNGNM 24042 (paratypes).

***Platymantis desticans* Brown, Richards, 2008**
Material examined: 4 specimens, Solomon Islands, Isabel Province, Barora Faa Island, (off the western tip of Isabel Island): SAMA R56849 (holotype), and SAMA R56850-52 (paratypes).

***Platymantis gillardi* Zweifel, 1960**
Material examined: 17 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, West New Britain Province, S coast, ca 7 mi NW Pomugu, Kandrian: CAS-SU 22877-78; Papua New Guinea, West New Britain Province, northern Nakanai Mountains, ridge between the Ivule and Sigole rivers on the northern edge of the Nakanai Plateau: UWZM 23787-96, 23799-800; East New Britain Province, Vouvou Camp: SAMA R64801-02.

***Platymantis guppyi* (Boulenger, 1884)**
Material examined: 59 specimens, Papua New Guinea, Bougainville Island, Bougainville Province, Camp Torokina: USNM 120852-53; Kunua: MCZ-A 38628, 38632-33, 38635, 38638-39, 38664-666, 38668, 38674, KU 93736-40, 98159-65, 98468; Melilup: MCZ-A 38629, 38659-60, 38667, 38669-72, 59498-501; Mutahi: CAS 106553-106565; Solomon Islands, Barora Faa Island (near Isabel Island): SAMA R56839, 56840; Guadalcanal Island, Tadai District, Mt. Austen, Barana Village: KU 307359, 307375-76, 307381, 307384-86.

***Platymantis latro* Richards, Mack, Austin, 2007**
Material examined: 18 specimens, Papua New Guinea, Admiralty Islands, Manus Province, Manus Island: KU 93750-54; Chachuau Camp near Tulu 1 Village: SAMA R62819 (holotype), UPNG 10051, SAMA R62820; Natnewai Camp: SAMA R62826; Lorengau: UPNG 10052-54, SAMA R62821-23; Rambutyo Island, Penchal Village: SAMA R62827; Los Negros Island, Salami Village: SAMA R62828-29 (paratypes).

***Platymantis macrops* (Brown, 1965)**
Material examined: 4 specimens, Solomon Islands, North Solomons, Bougainville Island, Bougainville Province, Kunua: MCZ-A 38195-96 (paratypes); Aresi, S. of Kunua: MCZ-A 41864 (holotype); Matsiogu: MCZ-A 78820.

***Platymantis macrosceles* Zweifel, 1975**
Material examined: 4 specimens, Papua New Guinea, West New Britain Province, Ti, Nakanai Mountains (central New Britain): BPBM 1005 (holotype); Nakanai Mountains, ridge between the Ivule and Sigole Rivers: UWZM 23721, UPNG 10007; Papua New Guinea, East New Britain Province, Vouvou Camp: SAMA R64815.

***Platymantis magnus* Brown, Menzies, 1979**
Material examined: 4 specimens, Papua New Guinea, New Ireland Island, New Ireland Province, W. Coast, approx. 88 km S Kavieng ("Madina High School area"): CAS 143640, (holotype); CAS 143639 (paratype); Utu, 1 km S, 5 km E Kavieng: MCZ-A 92671-72 (paratypes).

***Platymantis mamusiorum* Foufopoulos, Brown, 2004**
Material examined: 2 specimens, Papua New Guinea, West New Britain Province, northern Nakanai Mountains, ridge between the Ivule and Sigole rivers on the northern edge of the Nakanai Plateau (05°33.112'S, 151°04.269'E): UWZM 23720 (holotype), UWZM 23719, 23722, UPNG 9992 (Paratypes); Papua New Guinea, East New Britain Province, Vouvou Camp: SAMA R64713-14.

***Platymantis manus* Kraus, Allison, 2009**
Material examined: 2 specimens, Papua New Guinea, Admiralty Islands, Manus Province, Manus Island, lorengau, MCZ-A 87512 (holotype), 87513 (paratopotype)

***Platymantis mimicus* Brown, Tyler, 1968**
Material examined: 6 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, West New Britain Province, ca 18 mi S of Talasea, Numundo Plantation on Willaumez Peninsula: CAS-

SU 22874 (paratype), SAMA R6868 (holotype), R7064 (paratype); Kandrian: SAMA R 7069 (paratype); Moramora, 3 km N, 7 km E Hoskins: MCZ-A 88826, 89053.

Platymantis myersi **Brown, 1949**
Material examined: 7 specimens, Solomon Islands, Guadalcanal Island, river E Popomaneseu track: MCZ-A 79068-72; Papua New Guinea, Bougainville Island, Torokina: USNM 119584; Papua New Guinea, Bougainville Island, Kunua, AMNH 70066 (paratype).

Platymantis nakanaiorum **Brown, Foufopoulos, Richards, 2006**
Material examined: 8 specimens, Papua New Guinea, West New Britain Province, northern Nakanai Mountains, northern edge of the Nakanai plateau, on a ridge between the Ivule and Sigole rivers 1640 m elevation; UWZM 23897-98, UPNG 10010-11 (holotype and three paratypes); Papua New Guinea, East New Britain Province, Vouvou Camp: SAMA R64806-09, SJR 10733.

Platymantis neckeri **(Brown, Myers, 1949)**
Material examined: 47 specimens, Papua New Guinea, Bougainville Island, Bougainville Province: MCZ-A 30145-46 (paratypes); Bougainville Island, Kunua: USNM 217441; Melilup: MCZ-A 66853-56, 66849, 66849, 66851-53; Mutahi: MCZ-A 66877-78, 66881-82, 66885-90, 66893; 66926-38; CAS 106451-106458; Solomon Islands, Barora Faa island (near Isabel Island): SAMA R56792-93, 56841-42.

Platymantis nexipus **Zweifel, 1975**
Material examined: 17 specimens, Papua New Guinea, West New Britain Province, New Britain Island, Nakanai Mountains, ridge between the Ivule and Sigole Rivers, 900-1200 m above sea level: UPNG 10007-09, UWZM 23893, 23895-23896; Papua New Guinea, East New Britain Province, New Britain Island, Wanui Camp, Wanui River Valley (near Wide Bay), 310 m above sea level (05°21.638'S, 152°05.266'E): SAMA 56783-84; East New Britain Province, Gazelle Peninsula, Baining Mountains, St. Paul's, 100-400 m above sea level, BPBM 1009 (holotype); Papua New Guinea, East New Britain Province, Vouvou Camp: SAMA R64690-91, 64806-09, SJR 10733.

Platymantis papuensis **Meyer, 1875**
Material examined: 12 specimens, Indonesia, Papua Province, 'Hollandia': CAS-SU: 8790-91; Lake Sentani: CAS-SU 9709-12; Papua New Guinea, Madang Province, Naru Village: TNHC 51544-46; Papua New Guinea, Madang Province, Baiteta cave: TNHC 51541, 51978, 51980.

Platymantis parilis **Brown, Richards, 2008**
Material examined: 4 specimens, Solomon Islands, Isabel Province, north-western Isabel Island, Kolopakisa Village: SAMA R56911 (holotype), SAMA R56908-10 (paratypes).

Platymantis parkeri **(Brown, 1965)**
Material examined: 10 specimens, Solomon Islands, North Solomons, Bougainville Island, Bougainville Province, Kunua: MCZ-A 36914-22 (paratypes), 36923 (holotype).

Platymantis schmidti **Brown, Tyler, 1968**
Material examined: 41 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, East New Britain Province, Karat, Cherub Plantation: CAS 139651-52; Baining Mountain Range, Gazelle Peninsula: CAS-SU 22880-91 (paratypes); Talasea Plantation, Willaumez Peninsula: SAMA R6762, 6764, 6784, 6786, 6791, 6795, 6813, 7093, 7097 (paratypes), 7618 (holotype); San Remo, Willaumez Peninsula: 6858, 6862, 6912, 6923 (paratypes); L.A.E.S., Karavat, Gazella Penninsula (near Rabaul): SAMA R7147, 7099 (paratypes); Wanui, Wanui River Valley (near Wide Bay), 310 m above sea level (05°21.638'S, 152°05.266'E), New Britain Island, East New Britain Province: SAMA R57014-16, 57040-43; Papua New Guinea, West New Britain Province, northern Nakanai Mountains, ridge between the Ivule and Sigole rivers on the northern edge of the Nakanai Plateau: UWZM 23775-78; 23782, 23890.

Platymantis solomonis **(Boulenger, 1884)**
Material examined: 29 specimens, Papua New Guinea, Bougainville Island, Bougainville Province, Topanas: CAS 109817; Mutahi: CAS 109825-26; 109829-30, 109840; Solomon Islands, Barora Faa Island (near Isabel Island): SAMA R56843-44.; Papua New Guinea, Bougainville Island, Kunua: KU 93762-63; 98477; Solomon Islands, Western Province, Lola Island: KU 307144-25, 307136; Guadalcanal Province, Guadalcanal Island, Metapono District, Keamami Village: KU 307311; Tadai District, Mt. Austen, Barana Village: KU 307357, 307377, 307382, 307389, 307393, 307411, 307428.

Platymantis sulcatus **Kraus, Allison, 2007**
Material examined: 2 specimens, Papua New Guinea, Bismarck Archipelago, New Britain Island, East New Britain Province, Nakanai Mountains, Vouvou Camp (859 masl): SAMA R6481819.

Platymantis vitianus **(Duméril, 1853)**
Material examined: 8 specimens, Fiji, Viti Levu Islands, Viwa Island, Viwa Village, SW side of island: CAS 172510-12; Ovalau Island, 0.5 mi N of Navuloa Village: CAS 172525-29.

Platymantis vitiensis **(Girard, 1853)**
Material examined: 13 specimens, Fiji, Viti Levu Islands, Viti Levu Island, Savura Creek Rd., ca 1 km W of Savura Creek: CAS 172437, 172439-40, 172447, 172449-50, 172452-55, 172457; Ovalau Island, 10 km S, of Levuka, St. John's: CAS 172531-32.

Platymantis weberi **Schmidt, 1932**
Material examined: 29 specimens, Papua New Guinea, Bougainville Island, Bougainville Province, Mutahi: CAS 106567-72, 108313-19, 110918-19; MCZ-A 64586-87, 64589-90; Kunua: KU 98478; Solomon Islands, Guadalcanal Island, Tadai District, Mt. Austen, Barana Village: KU 30744, 307350, 307430, 307358, 307367, 307373-74, 307378, 307410; Barora Faa Island (near Isabel Island): SAMA R56853-54, 56856; Isabel Island, Kolopakisa Village: SAMA R56916

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Table 1. Call characteristics of *Platymantis custos* sp. nov.

Specimen number	Number of calls	Notes / call	Call length (sec.)	Note rep. rate (notes / sec.)	Note length	Inter-note length	Dominant Frequency (Hz)
SAMA R63512	8	10-33	0.9-3.1	9.79-10.51	0.02-0.03	0.06-0.14	3603-3823
SAMA R63513	3	15-30	1.4-3.3	8.93-9.88	0.01-0.03	0.07-0.13	3755-4128
SAMA R 63525	8	6-30	0.4-2.9	9.19-16.13	0.01-0.04	0.01-0.14	3711-4317
Mean		21.63	2.105	10.346	0.022	0.078	3835
SD		11.015	1.171	0.830	0.004	0.016	23.30

Table 2. Measurements (in mm) and proportions of the type series of *Platymantis custos* sp. nov. (SAMA R63525 = holotype).

Reg No.	Sex	SVL	TL	TL/SVL	EN	IN	HW	HL	HL/SVL
SAMA R63510	M	30.3	16.7	0.55	3.8	2.4	10.4	12.1	0.40
SAMA R63511	M	25.9	15.6	0.60	3.2	2.0	8.8	9.7	0.38
SAMA R63512	M	29.6	17.3	0.58	3.8	2.4	10.6	11.9	0.40
SAMA R63513	M	29.6	17.5	0.59	3.9	2.5	9.6	11.5	0.39
SAMA R63514	M	28.8	16.5	0.57	3.9	2.1	9.4	11.2	0.39
SAMA R63515	M	28.0	18.2	0.65	3.7	2.1	9.7	11.1	0.40
SAMA R63516	M	29.5	17.5	0.59	3.9	2.4	10.2	11.5	0.39
SAMA R63517	M	29.6	17.4	0.59	4.0	2.1	9.9	11.7	0.40
SAMA R63518	F	29.5	18.6	0.63	3.9	2.4	10.2	11.3	0.38
SAMA R63519	M	29.6	18.0	0.61	3.7	2.2	9.8	11.5	0.39
SAMA R63520	M	28.8	17.1	0.60	3.9	2.4	10.0	11.9	0.41
SAMA R63521	M	28.7	16.7	0.58	3.8	2.3	9.6	11.1	0.39
SAMA R63522	F	32.8	18.6	0.57	4.1	2.3	10.6	12.5	0.38
SAMA R63523	M	29.1	15.8	0.54	3.5	2.1	10.2	9.5	0.33
SAMA R63525	M	30.9	17.4	0.56	3.8	2.2	10.5	11.5	0.37
UPNG 10018	F	29.3	18.1	0.62	4.1	2.4	9.4	11.9	0.41
UPNG 10019	F	32.2	18.8	0.58	4.2	2.6	9.9	12.1	0.38
UPNG 10020	M	28.6	16.7	0.58	3.5	2.4	9.6	11.2	0.39
UPNG 10021	M	28.4	16.9	0.60	4.0	2.2	9.6	11.4	0.40
UPNG 10022	M	29.0	16.3	0.56	3.6	2.3	9.8	11.2	0.39
UPNG 10023	M	31.1	17.2	0.55	4.3	2.4	10.4	12.4	0.40
UPNG 10024	M	29.3	17.4	0.60	3.8	2.2	9.8	11.5	0.39

Reg No.	EYE	EYE/SVL	EAR	4TD	4TP	3FD	3FP	3FD/3FP	1 FD
SAMA R63510	4.1	0.14	1.9	1.1	0.6	2.1	0.6	3.50	1.0
SAMA R63511	3.3	0.13	2.0	0.9	0.5	1.5	0.5	3.00	0.8
SAMA R63512	4.2	0.14	2.1	1.2	0.6	2.2	0.5	4.40	0.8
SAMA R63513	3.7	0.13	2.0	1.1	0.5	2.1	0.5	4.20	0.9
SAMA R63514	3.3	0.12	2.0	1.0	0.5	1.8	0.5	3.60	0.9
SAMA R63515	3.4	0.12	1.7	1.1	0.5	2.0	0.5	4.00	0.8
SAMA R63516	4.1	0.14	1.9	1.3	0.6	2.1	0.5	4.20	0.9
SAMA R63517	3.5	0.12	2.0	1.0	0.5	1.9	0.5	3.80	0.7
SAMA R63518	3.6	0.12	2.0	1.1	0.6	1.9	0.5	3.80	0.9
SAMA R63519	3.5	0.12	2.0	1.2	0.7	2.0	0.5	4.00	0.9
SAMA R63520	3.4	0.12	1.7	1.2	0.6	2.1	0.5	4.67	0.8
SAMA R63521	3.3	0.12	1.6	1.0	0.4	1.6	0.5	3.20	0.7
SAMA R63522	4.0	0.12	1.7	1.2	0.5	2.1	0.5	4.67	0.9
SAMA R63523	3.2	0.11	1.7	1.0	0.5	1.8	0.5	4.00	0.8
SAMA R63525	3.7	0.12	1.8	1.1	0.5	2.0	0.5	4.00	0.9
UPNG 10018	3.9	0.13	2.0	1.2	0.5	2.2	0.4	5.50	1.0
UPNG 10019	4.0	0.12	2.1	1.1	0.5	2.2	0.6	4.00	0.9
UPNG 10020	3.6	0.13	1.8	1.1	0.5	1.9	0.6	3.46	0.8
UPNG 10021	3.6	0.13	1.9	1.1	0.5	2.1	0.5	4.20	0.8
UPNG 10022	3.6	0.12	2.0	1.0	0.5	2.0	0.5	4.00	0.8
UPNG 10023	3.7	0.12	2.1	1.1	0.5	1.9	0.5	3.80	0.9
UPNG 10024	3.4	0.12	1.6	1.2	0.5	1.9	0.5	4.22	0.9

Xantholinini of the Australian region (Coleoptera: Staphylinidae), VI. Species from New Guinea of the Last collection in the Manchester museum. New genus, new species and new records

228° contribution to the knowledge of the Staphylinidae

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Abstract: A new genus (*Guineella* gen. nov.) and twelve new species of Xantholinini (*Pachycorynus diaphanus* sp. nov., *Adamantea fluviatilis* sp. nov., *Adamantea karkar* sp. nov., *Neoxantholinus daulo* sp. nov., *Zeteotomus kassem* sp. nov., *Australinus papuanus* sp. nov., *Thyreocephalus eminens* sp. nov., *Guineella hornabrookiana* sp. nov., *Eachamia losti* sp. nov., *Metolinus longelytratus* sp. nov., *Metolinus papuanus* sp. nov., *Andelis punctatus* sp. nov.) are described from Papua New Guinea. Some species are the first of their genera known from New Guinea (*Adamantea fluviatilis, Adamantea karkar* and *Australinus papuanus*).

Key words: Coleoptera, Staphylinidae, Xantholinini, *Pachycorynus*, *Adamantea*, *Neoxantholinus*, *Zeteotomus*, *Australinus*, *Thyreocephalus*, *Guineella* gen. nov., *Eachamia*, *Metolinus*, *Andelis*, *Mitomorphus,* new species, new records.

Introduction

Following the revision of the Xantholinini of the Oriental Region (Bordoni 2002), I have studied species from Australia (Bordoni 2005a), New Zeeland (Bordoni 2005b) and New Guinea (Bordoni 2010a). Subsequently I published other contributions on the species of this tribe from the Australasian Region: Bordoni 2010b, 2010c, 2010d, 2011.

Recently my colleague Dr. Dmitri Logunov invited me to study some Xantholinini collected by R. Hornabrook in New Guinea in the years 1965-1975 preserved in the collection of Horace Last in the Manchester Museum. Some specimens were studied in the past by this entomologist and are in litteris. All these species have the label "unpublished name, Solodovnikov 2006". Previously the same author (Last 1980) published some new species of Xantholinini from New Guinea (Bordoni 2010a).

In the revision of the Xantholinini of New Guinea (Bordoni 2010a), the idenfication keys of the Xantholinini genera occurring in the Papuan region are listed.

In this contribution I describe a new genus and twelve species and I list new records for other five species.

Abbreviations used in the text:

CAB – Collection Arnaldo Bordoni, Firenze, Italy;
MM – The Manchester Museum, United Kingdom;
ex. – specimen;
exx. – specimens;
Isl. – island(s).

Descriptions of new taxa

Pachycorynus diaphanus sp. nov.

Holotype ♂ MM, Papua, Kagulbusa, R. Hornabrook leg. 1.VIII.1965.

Derivatio nominis: The specific epithet is based on the Latin 'diaphanus' (diaphanous), in reference to the aedeagus.

Description: Length of body: 6 mm; from anterior margin of head to posterior margin of elytra: 2.9 mm. Dark brown, with posterior half of elytra yellowish. Head large, very dilated, with largely rounded sides and posterior angles. Surface without lateral groove, with fine and dense polygonal micro-reticulation and with deep, large, sub-ovoid and dense puncturation. Pronotum small, narrower and shorter than head, slightly dilated anteriorly, with largely rounded anterior angles. Surface with deep, rounded and dense puncturation on the sides of median band. Elytra much longer and wider than pronotum, with sub-rectilinear and sub-parallel sides and marked humeral angles. Surface shiny, without micro-sculpture, with small and dense puncturation, arranged in several regular series. Abdomen with more or less polygonal micro-reticulation and fine, sparse puncturation. Tergite and sternite of the male genital segment as in Figs 1-2. Aedeagus (Fig. 3) very membranous, 1.3 mm long, with particular distal structure, symmetrical parameres, and inner sac with scales and spines.

Sexual dimorphism: Female is unknown.

Distribution: Only known from the type locality.

Note: The specimen bears the labels "*Pachycorynus subjectus* sp. n., Type, H. Last det.", "Type" (on round label with red border). This species is closely related to *Pachycorynus okapaensis* Bordoni, 2010a from the same locality, but differs in its dimension, colour, puncturation and by the structure of the inner sac of the aedeagus. The holotype of *P. okapaensis*, with the holotype of *P. guadalcanalensis* Bordoni, 2010a, is now preserved in the British Museum of London.

***Adamantea fluviatilis* sp. nov.**

Holotype ♂ MM, Papua, Madang, Gogol river, R. Hornabrook leg. II.1970.

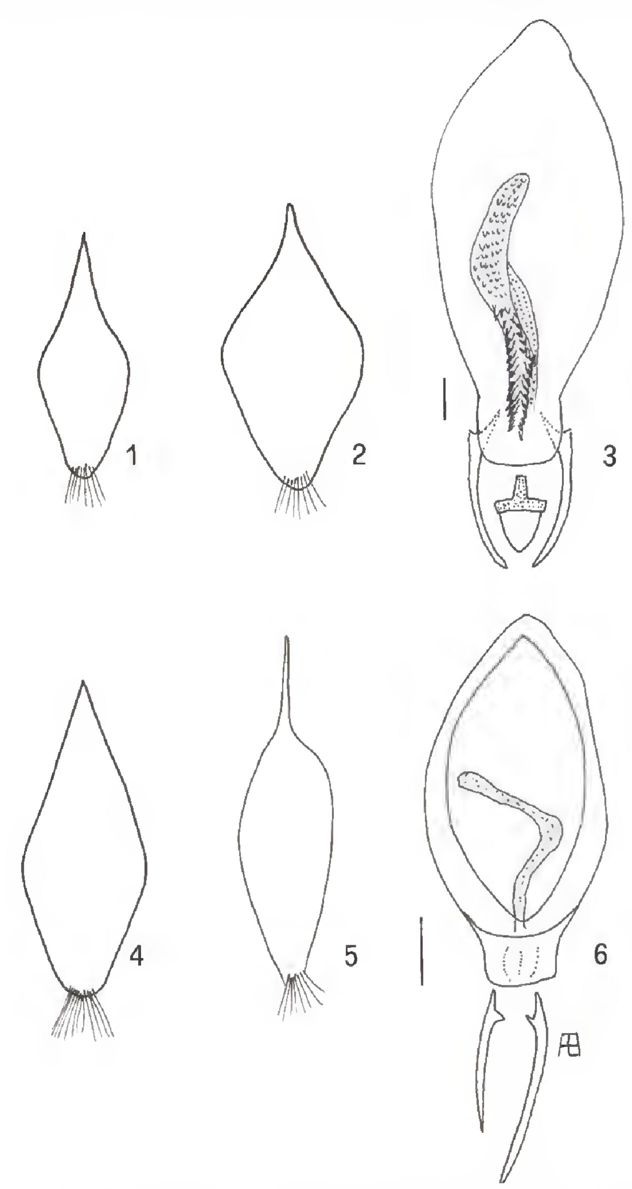
Derivatio nominis: The specific epithet is based on the Latin 'fluviatilis' (fluviatile).

Description: Length of body: 6.5 mm; from anterior margin of head to posterior margin of elytra: 2.7 mm. Brown reddish; body flat. Head sub-rectangular, with sub-rectilinear sides and largely rounded posterior angles. Eyes small and protruding. Surface with longitudinal micro-striations, ovoid and with deep puncturation, i.e. the distance between the punctures is similar to their diameter. Frontal grooves convergent in a longitudinal, short median groove. Ocular grooves deep and long, sub-parallel with the other grooves. Pronotum narrower than head, more or less as long as the head, very dilated anteriorly, with sub-parallel sides and largely rounded anterior angles. Surface with oblique transverse micro-striation on the sides, with dorsal series of 10-11 fine punctures and oblique lateral series of 7-8 larger punctures; some other punctures near the anterior angles. Elytra large, much longer and wider than pronotum, dilated posteriad, with well marked humeral angles. Surface shiny, with fine and dense puncturation arranged in numerous regular series. Abdomen shiny, with transverse micro-striation and fine puncturation on the sides. Tergite and sternite of the male genital segment as in Figs 4-5. Ardeagus (Fig. 6) ovoid, 0.8 mm long, with asymmetrial parameres, and inner sac with pale, minute scales.

Sexual dimorphism: Female is unknown.

Distribution: Only known from the type locality.

Note: The specimen bears the label "*Holocorynus fluviatilis* sp. n., Type, H. Last. det.". The genus *Adamantea* was described (Bordoni 2013) for some species from Pacific islands, some of those in the past were referred to the genus *Pachycorynus* Motschulsky, 1858. The genus occurs in Marquesas, Tonga, Samoa, New Caledonia, and Fiji Isl. *Adamantea fluviatilis* and the following *A. karkar* sp. nov. are the first species of this genus



Figures 1-6. New species of Xantholinini. 1-3: *Pachycorynus diaphanus* sp. nov. 1 – Tergite of the male genital segment; 2 – Sternite of the same; 3 – Aedeagus; 4-6: *Adamantea fluviatilis* sp. nov. 4 – Tergite of the male genital segment; 5 – Sternite of the same; 6 – Aedeagus [scale bars 0.1 mm].

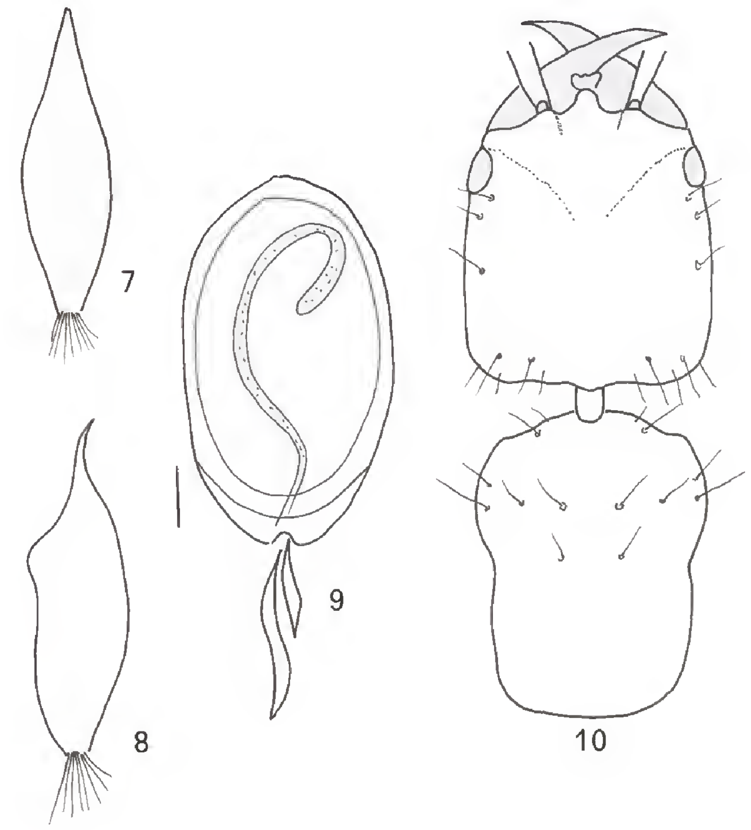
known from New Guinea. The new species is similar to *Adamantea koghiana* Bordoni, 2013 from New Caledonia, but differs in its dimension, colour and the aedeagus.

Adamantea karkar **sp. nov.**
Holotype ♂ MM, Papua, Karkar Isl., R. Hornabrook leg. X.1968.

Derivatio nominis: The specific epithet refers to the type locality, Karkar, as a noun in apposition.
Description: Length of body: 5 mm; from anterior margin of head to posterior margin of elytra: 2.3 mm. Body very flat, light reddish brown; antennae and legs yellowish. Head sub-rectangular, slightly longer than wide, with sub-rectilinear and sub-parallel sides, almost right posterior angles. Eyes small and scarcely protruding. Surface similar to those of *Adamantea fluviatilis* but with larger and sparser puncturation. Pronotum shorter and narrower that head, with largely rounded anterior angles. Surface as in *A. fluviatilis*, with a dorsal series of 5-6 punctures and oblique lateral series of 5 larger punctures. Elytra very long, longer and wider that pronotum, dilated posteriad, with marked humeral angles. Surface rugose, with more or less polygonal and fine micro-reticulation and fine and dense puncturation, arranged in numerous series. Abdomen with traces of transversal micro-striation and fine puncturation, arranged in some regular series. Tergite and sternite of the male genital segment as in Figs 7-8. Aedeagus (Fig. 9) ovoid, 0.9 mm long, with asymmetrical parameres; inner sac long and narrow, with sparse, fine scales.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The new species is similar to *Adamantea samoana* Bordoni, 2013 from Samoa, but differs in its dimension, colour, puncturation and the aedeagus.

Neoxantholinus daulo **sp. nov.**
Holotype ♂ MM, Papua, Daulo Pass, Asato-Chimbu Div., R. Hornabrook leg. 31.XII.1973.

Derivatio nominis: The specific epithet refers to the type locality, Daulo, as a noun in apposition.
Description: Length of body: 11 mm; from anterior margin of head to posterior margin of elytra: 5.5 mm. Reddish brown with yellow orange abdomen; antennae brown, legs yellowish brown. Head sub-rectangular (Fig. 10), with strictly rounded posterior angles, scarcely rounded sides. Eyes very small and almost flat. Surface with longitudinal very fine



Figures 7-10. New species of Xantholinini. 7-9: *Adamantea kassem* sp. nov. 7 – Tergite of the male genital segment; 8 – Sternite of the same; 9 – Aedeagus [scale bar 0.1 mm]; 8-10: *Neoxantholinus daulo* sp. nov. 10 – Head and pronotum [scale bar 1 mm].

and dense micro-striation; ocular grooves very long and convergent to the median line; puncturation as in Fig 10. Labrum as in Fig. 11. Pronotum (Fig. 10) shorter and narrower that head, very dilated anteriorly; surface with oblique micro-striations and punctuation as figured. Elytra very narrow, sub-rectangular, with sub-rectilinear and sub-parallel sides, as long as and narrower than the pronotum. Surface shiny, with micro-puncturation and puncturation arranged in three very superficial series, one near the suture, one median and one lateral. Abdomen shiny, with fine sparse punctures. Tergite and sternite of the male genital segment as in Figs 12-13. Aedeagus (Fig. 14) sub-spherical, narrow in the distal part, 1.3 mm long, with parameres reduced to vestiges; inner sac covered in scales.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The specimen bears the labels "*Metoponcus cooteri* sp. n., Type, H. Last. det.", "Holotype". The new species is similar to *Neoxantholinus ullrichi* Bordoni, 2010a from Onerunka, but differs in its dimension, colour and the aedeagus.

Neoxantholinus ullrichi **Bordoni, 2010a**
Examined material: 1♀ MM, Papua, Okapa, Estern Highlands, R. Hornabrook leg. 30.I.1965 ("*Metoponcus*

hornabrooki sp. n., Type, H. Last det.", "Holotype").

Distribution: This species was known only from the type locality (Onerunka, Kainantu) (Bordoni 2010a).

Zeteotomus kassem **sp. nov.**

Holotype ♂ MM, Papua, Kassem Pass (Eastern Highlands Distr.), R. Hornabrook leg. 29.IV.1972.

Derivatio nominis: The specific epithet refers to the type locality, Kassem, as a noun in apposition.

Description: Length of body: 6 mm; from anterior margin of head to posterior margin of elytra: 3 mm. Dark brown; legs brown with yellowish tarsi. Head cylindrical, long and narrow, with sub-rectilinear and sub-parallel sides, right posterior angles. Eyes small, scarcely protruding. Surface with longitudinal and fine micro-striation; puncturation small and sparse; three spaced punctures in longitudinal line between the eyes and the posterior angles. Epistoma without median groove. Pronotum as long as the head, scarcely shorter, narrow and long, with rounded anterior angles, sides only sinuate. Surface with longitudinal micro-striations, with one lateral puncture anteriorly and 2 spaced punctures in a longitudinal line before the middle of the pronotum; some scattered minute punctures. Elytra longer and wider than pronotum, dilated posteriad, with scarcely marked humeral angles. Surface with three series of spaced and very superficial, fine, punctures. Abdomen shiny, with traces of transverse micro-striation and fine and sparse puncturation. Male genital segment as in Fig. 15; sternite of the male membranous in the distal portion, as in Fig 16. Aedeagus (Fig. 17), ovoid, 1.2 mm long, without vestiges of parameres, with complex inner sac.

Sexual dimorphism: Female is unknown.

Distribution: Only known from the type locality.

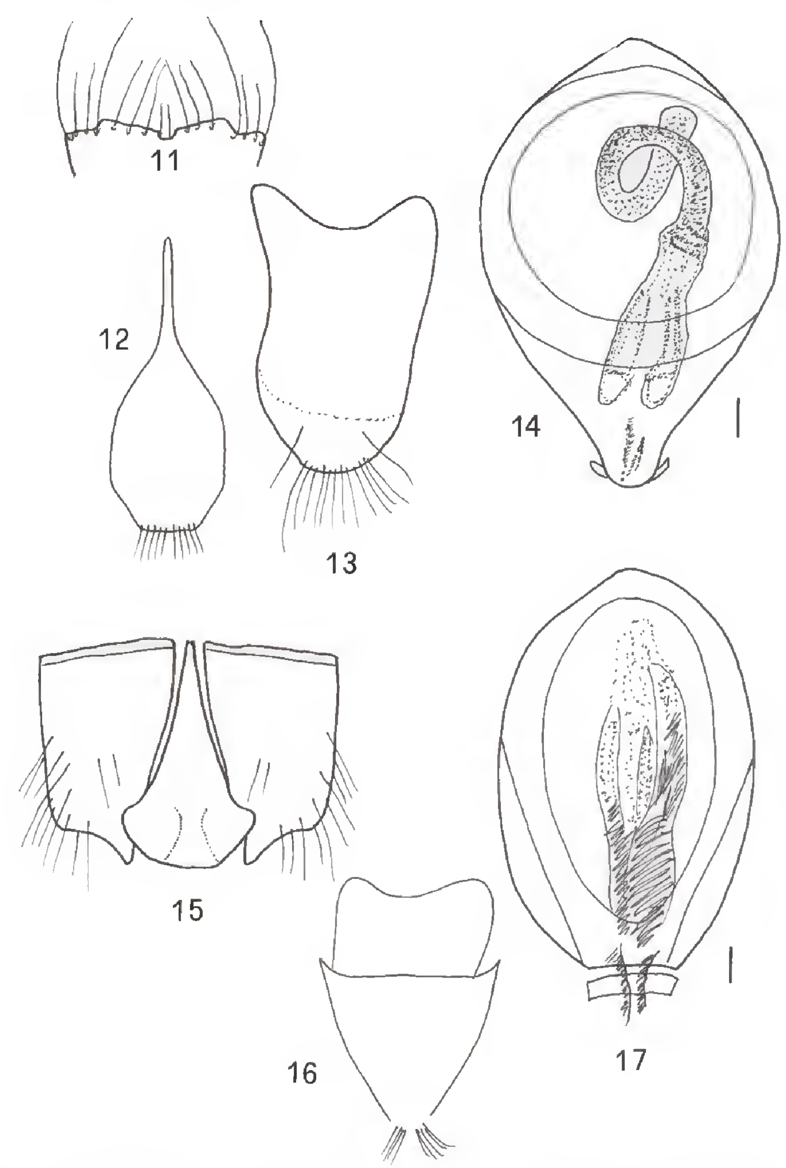
Note: The specimen bears the label "*Metoponcus transitus* sp. n., H. Last det.", "Type" (round label with red border). This species is similar to *Zeteotomus morokanus* Bordoni, 2010a from New Guinea (Moroka, Kemandoga, Testega) but differs by dimension, colour, and by the structure of the inner sac of the aedeagus.

Australinus papuanus **sp. nov.**

Holotype ♂ MM, Papua, Eastern Highlands, Okapa, R. Hornabrook leg. 14.XII.1964.

Derivatio nominis: The specific epithet refers to Papua.

Description: Length of body: 5.5 mm; from anterior margin of head to posterior margin of elytra: 2.4 mm. Reddish brown with darker abdomen. Head long, sub-rectangular, scarcely dilated posteriad. Eyes small and flat. Surface shiny, with micro-puncturation, with one puncture in the ocular grooves, two punctures in the groove at the posterior margin of the eyes, one near the posterior angles, one median. Pronotum shorter and narrower that head, with oblique anterior margins. Surface with traces of oblique micro-striation, with dorsal series of 5 large widely spaced punctures and lateral series of 2 punctures. Elytra longer and wider than pronotum, dilated posteriad, without marked humeral angles. Surface rugose, with three series of punctures, one near the suture, one median and one lateral. Abdomen with traces of micro-striation and fine and sparse puncturation. Tergite and sternite of the male genital segment as in Figs 18-19. Aedeagus (Fig. 20) ovoid, distally narrow, 0.5 mm long, with asymmetric parameres; inner sac narrow and long, covered in minute



Figures 11-17. New species of Xantholinini. 11-14: *Neoxantholinus daulo* sp. nov. 11 – Labrum; 12 – Tergite of the male genital segment; 13 – Sternite of the same; 14 – Aedeagus; 15-17: *Zeteotomus kassem* sp. nov. 15 – Male genital segment (with the related tergite); 16 – Sternite of the same; 17 – Aedeagus [scale bars 0.1 mm].

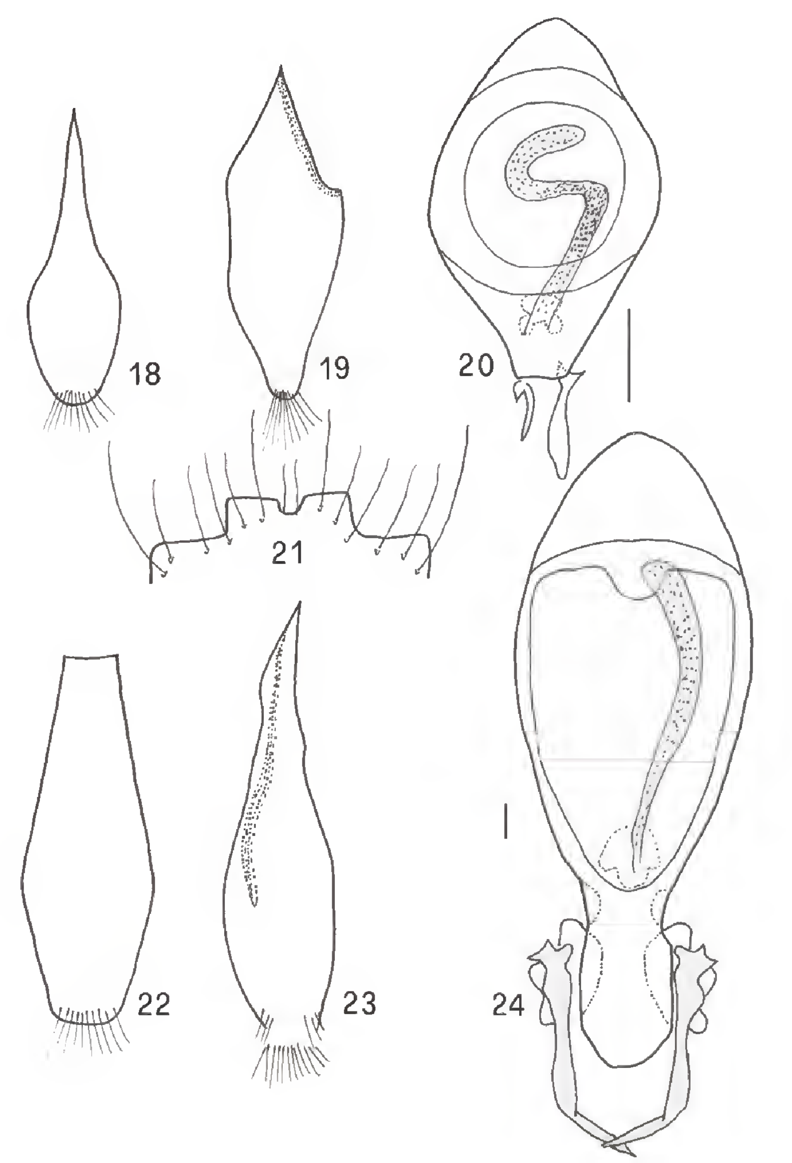
scales.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The species bear the labels "*Metoponcus vividus* sp. n., Type, H. Last det.", "Type" (round label with red border). The genus *Australinus* was described (Bordoni 2005a) for few species of Australia [*A. cyaneipennis* (McLeay, 1873), *A. sexsulciceps* (Lea, 1925)], and Lord Howe Isl. [*A. lordhowensis* Bordoni, 2005a, *A. megacephalus* (Lea, 1925)]. *Australinus papuanus* is the first species of this genus known from New Guinea. *Australinis papuanus* is similar to *A. cyaneipennis* in the structure of the aedeagus but very different in dimensions and colour.

Thyreocephalus eminens **sp. nov.**
Holotype ♂ MM, Papua, Eastern Highlands, Okapa, R. Hornabrook leg. 27.VIII.1965.

Derivatio nominis: The specific epithet is based on the Latin 'eminens' (eminent).
Description: Length of body: 19 mm; from anterior margin of head to posterior margin of elytra: 7.5 mm. Black with reddish genital segment; abdomen and legs brownish black; antennae with the last three segments yellow. Head with bluish reflex, pronotum with violaceous reflex; elytra with evident bronze greenish reflex. Head proportionally small, sub-quadrangular, scarcely longer than wide, with sub-rectilinear and sub-parallel sides, largely rounded posterior angles. Eyes small and scarcely protruding, with a groove at the inner margin. Surface of the head shiny, with micro-puncturation, one puncture at the end of the short divergent ocular grooves, one puncture at the inner margin of the eyes, one median; some punctures close to the posterior angles. Labrum as in Fig. 21. Pronotum sub-rectangular, as wide as and longer than the head, with almost right anterior angles and sub-rectilinear anterior margins, not oblique, scarcely sinuate sides, narrower before the middle of the sides. Surface shiny, with micro-puncturation, a large puncture close to the anterior angles, two small punctures near the narrow sides and three small punctures in the middle of the pronotum. The epipleural portion of the pronotum with a groove and a carina. Elytra large, sub-rectangular, larger and wider than pronotum, with sub-rectilinear and sub-parallel sides and marked humeral angles. Surface shiny, with three series of punctures, one near the suture, one median and one lateral. Abdomen with traces of transverse micro-striation and evident, dense puncturation, arranged in series. Tergite and sternite of the male genital segment as in Figs 22-23. Aedeagus (Fig. 24) ovoid, 2.2 mm long, with large distal portion; parameres symmetrical; inner sac short and narrow.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The specimen beaars the labels "*Thyreocephalus splendens* sp. n., Type, H. Last det.", "Type" (on round label with red border). This new species is similar to *Thyreocephalus splendens* Cameron, 1939 from Irian Jaya and Papua (Bordoni 2010a), but differs in its dimensions, colour, and by the structure of the aedeagus.

Thyreocephalus aureus **Bernhauer, 1915**
Examined material: 2 exx. MM, Papua, Karkar Isl., R. Hornabrook X.1968; 1 ex. CAB, same data.

Distribution: Bismark Archipelago (New Britain), New Guinea, D'Entrecasteaux Isl. (Fergusson &



Figures 18-24. New species of Xantholinini. 18-20: *Australinus papuanus* sp. nov. 18 – Tergite of the male genital segment; 19 – Sternite of the same; 20 – Aedeagus; 21-24: *Thyreocephalus eminens* sp. nov. 21 – Labrum, 22 – Tergite of the male genital segment; 23 – Sternite of the same; 24 – Aedeagus [scale bars 0.1 mm].

Normanby islands) (Bordoni 2010a).

***Thyreocephalus papuensis* Bernhauer, 1915**

Examined material: 1 ex. MM, Papua, Sepik, Blackwater River, R. Hornabrook VI.1974; 1 ex. CAB, same data ("*Thyreocephalus alveus* sp. n., Type, H. Last det.", the first "Type" (on round label with red border), the second "Paratype" (on round label with yellow border).

Distribution: New Guinea (Bordoni 2010a).

***Guineella* gen. nov.**

Type species: *Guineella hornabrookiana* sp. nov.

Derivatio nominis: The generic epithet should refer to New Guinea.

Description: Head (Fig. 25) with short and superficial frontal grooves; very short ocular grooves; surface with very fine and dense polygonal micro-reticulation and with a median superficial groove; puncturation as in Fig. 25; labrum as in Fig. 26; maxillary and labial palpi as in Figs 27-28; antennae with 3rd segment twice as long as 2nd, the following small, sub-quadrangular; mandibles long and large, with median-distal lateral groove; gular sutures as in Fig. 29; pronotum with fine and dense polygonal micro-reticulation, with posterior dorsal series of very small punctures and oblique lateral series of small punctures; anterior tarsi very dilated; posterior tarsi with the last segment as long as the three previous together; antisternal plate with a suture; upper epipleural line of the pronotum sub-parallel with the inferior line and not joined to it; metasternum as in Fig. 30; mesosternum long and flat; sternite of the male genital segment modified (Fig. 32); shape of aedeagus characteristic (Figs 33-34).

Sexual dimorphism: Female is unknown.

Distribution: Papua New Guinea.

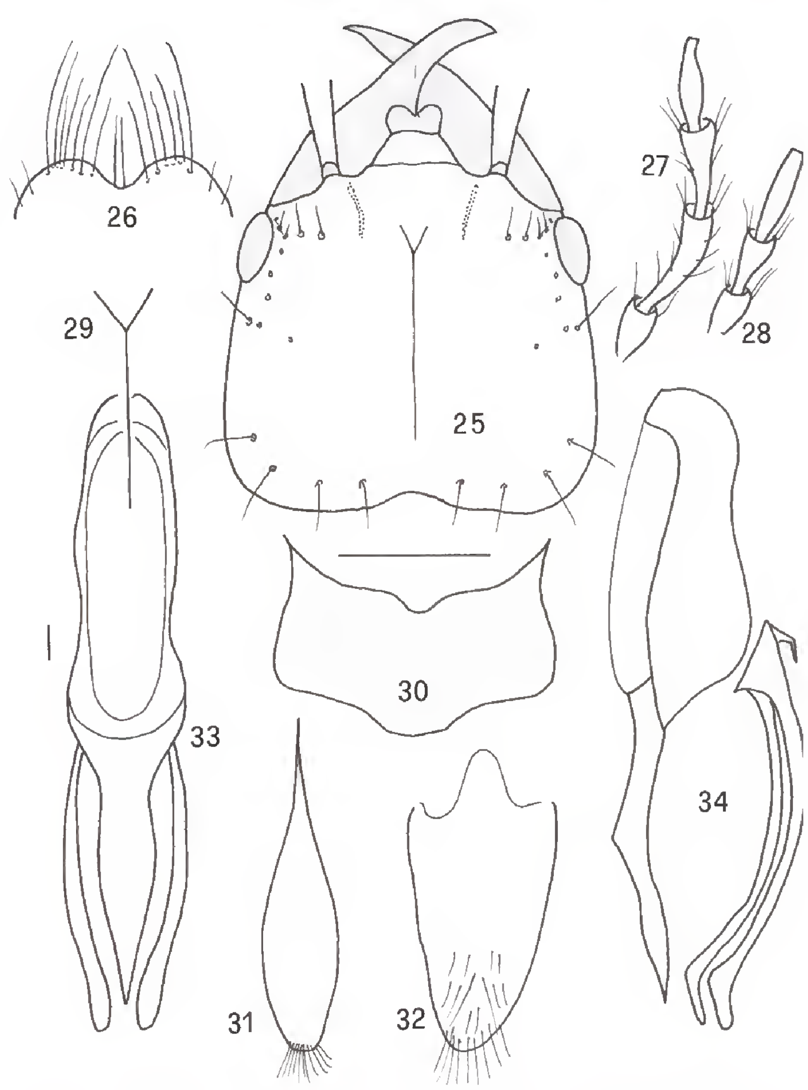
Note: This genus is isolated in the tribe. *Guineella* is probably allied to the genera *Thyreocephalus* Guérin-Méneville, 1844, *Dinoxantholinus* Heller, 1910, and *Guineodinella* Bordoni, 2010a, but differs in all the external characters and the shape of the aedeagus. The knowledge of the Xantholinini of New Guinea is therefore still now perfunctory.

***Guineella hornabrookiana* sp. nov.**

Holotype ♂ MM, Papua, Marifunga (Bismarck Range, 2800 m, Eastern Highlands), R. Hornabrook leg. 25.IV.1972.

Derivatio nominis: Patronymic. Dedicated to the collector of the material listed in this contribution, R. Hornabrook (Wellington), one of the first entomologists who worked on the insects of New Guinea.

Description: Length of body: 18 mm; from anterior margin of head to posterior margin of elytra: 9 mm. Black, with 6th visible abdominal segment and genital segment reddish; antennae brown; apex of the last segment yellowish. Forebody with very fine and dense polygonal micro-reticulation; elytra rugose, with irregular micro-reticulation. Head large (Fig. 25), with small and scarcely protruding eyes; short and convergent frontal grooves; ocular grooves pit-shaped with two punctures; puncturation as in Fig. 25. Pronotum longer and narrower than head, anteriorly dilated, the sides not sinuate and with marked anterior angles. Surface with dorsal series of 2 very fine punctures and an oblique lateral series of 3 fine punctures. Elytra longer and wider than pronotum, dilated posteriad, with marked humeral angles. Surface with very fine and widely spaced puncturation, arranged in four series, one near the suture, two median and one lateral. Abdomen with finer and denser microsculpture than those



Figures 25-34. *Guineella* gen. nov. *hornabrookiana* sp. nov. 25 – Head [scale bar 1 mm]; 26 – Labrum; 27 – Maxillary palpus; 28 – Labial palpus; 29 – Gular sutures; 30 – Mesosternum; 31 – Tergite of the male genital segment; 32 – Sternite of the same; 33-34 – Aedeagus in dorsal and lateral view [scale bar 0.1 mm].

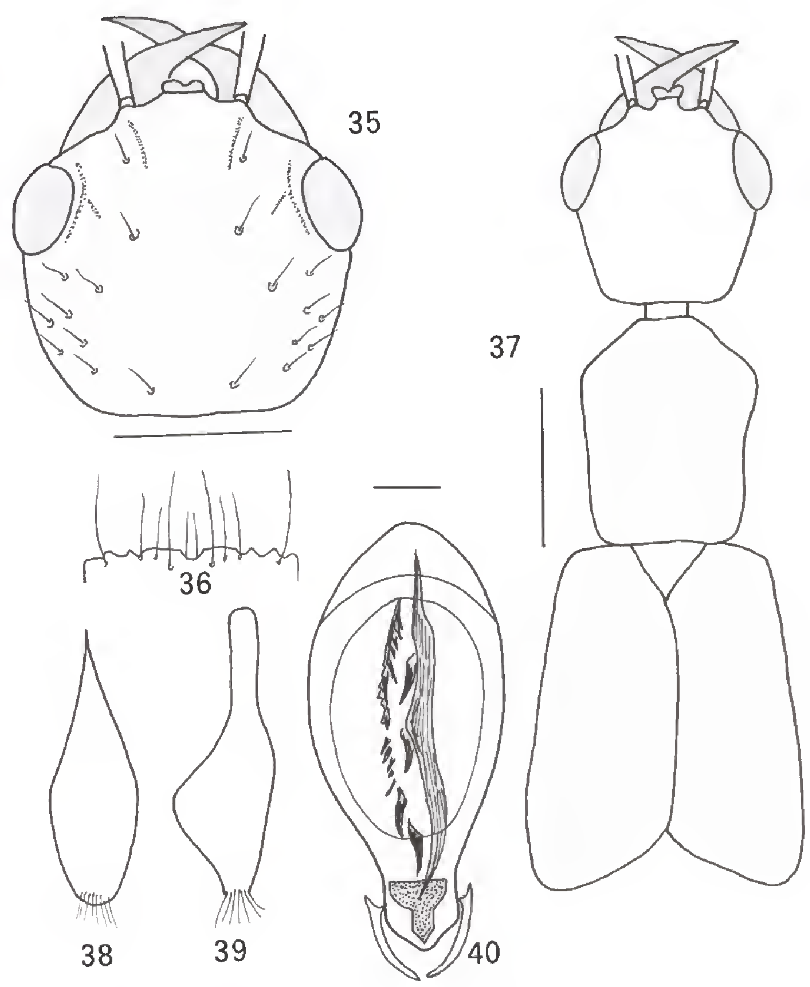
of forebody, with fine and sparse puncturation on the sides. Tergite and sternite of the male genital segment as in Figs 31-32. Aedeagus (Figs 33-34) very characteristic, 2.2 mm long, with long and narrow distal portion; parameres very long and narrow; inner sac apparently not visible.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The specimen bears the labels "*Thyreocephalus hornabrooki* sp. n., Type, H. Last det", "Type" (on round label with red border).

Eachamia lasti **sp. nov.**
Holotype ♀ MM, Papua, Kassem, R. Hornabrook leg. 22.IX.1972.

Derivatio nominis: Patronymic. Dedicated to Horace Rupert Last who designated it as a new species in litteris, like some of the other species listed in in this text. His papers dealt, from the late 1960s on various groups of Staphylinidae of New Guinea.
Description: Length of body: 8 mm; from anterior margin of head to posterior margin of elytra: 4.8 mm. Head black, pronotum, elytra and abdomen brown; anterior margin of elytra light brown. Head dilated (Fig. 35), sub-spherical, narrow posteriad, with large and protruding eyes. Labrum as in Fig. 36. Surface of the head with sparse micro-punctuation and puncturation as in Fig. 35. Prontum narrower and longer than head, anteriorly dilated, with marked anterior angles, with 2 punctures near the anterior angles. Elytra longer and wider than pronotum, with very marked humeral angles; puncturation fine and dense, arranged in numerous series. Abdomen with transversal micro-striation, and sparse and evident puncturation, arranged in regular series.
Sexual dimorphism: Male is unknown.
Distribution: Known only from the type locality.
Note: This species bears the following labels "*Thyreocephalus metallicus* sp. n., Type, H. Last det.", "Paratype, H. Last det." (on round label with yellow border) (I do not know the eventual type in litteris). The species differs from all congeners in its dimensions, colour, head and the shape of the labrum.

Metolinus longelytratus **sp. nov.**
Holotype ♂ MM, Papua [?], Frigano (I cannot find this locality), R. Hornabrook leg. 14.VII.1972.

Derivatio nominis: The specific epithet is based on the Latin *longe elytratus* (long elytra).
Description: Length of body: 5 mm; from anterior margin of head to posterior margin of elytra: 2.4 mm. Body of characteristic shape (Fig. 37), brownish black with posterior half of elytra yellowish; antennae and legs pale testaceus. Head with traces of transverse micro-striation, with one large puncture near the superior margin of eyes, two median and some punctures near the posterior angles. Pronotum with similar micro-striation, with a dorsal series of 5 punctures and lateral series of 3 punctures. Elytra rugose, with very fine puncturation arranged in three series, one near the suture, one median and one lateral. Abdomen with transverse micro-striation and fine and sparse puncturation on the sides, with long yellowish setae. Tergite and sternite of the male genital segment as in Figs 38-39. Aedeagus (Fig. 40) 0.7 mm long, with characteristic distal sclerite; inner sac with one very long and large spine and scales and small spines.
Sexual dimorphism: Female is unknown.
Distribution: Only known from the type locality.
Note: The specimen bears the labels "*Metolinus oculatus* sp. n., H. Last det, "Type" (on round label with red border). I change the name because *Metolinus oculatus* was previously published



Figures 35-40. New species of Xantholinini. 35-36: *Eachamia lasti* sp. nov. 35 – Head [scale bar 1 mm]; 36 – Labrum; 36-40: *Metolinus longelytratus* sp. nov. 37 – Forebody [scale bar 0.5 mm]; 38 – Tergite of the male genital segment; 39 – Sternite of the same; 40 – Aedeagus [scale bar 0.1 mm].

(Bordoni 2010a). The new species is similar to *Metolinus montanus* Bordoni, 2010a from Chimbu Prov., but differs in the body shape, dimensions, puncturation, and the aedeagus.

Metolinus papuanus **sp. nov.**

Holotype ♂ MM, Papua, Madang, R. Hornabrook leg. 10.XI.1968.

Derivatio nominis: The specific epithet refers to Papua.

Description: Length of body: 6.5 mm; from anterior margin of head to posterior margin of elytra: 3.2 mm. Body squat and robust (Fig. 41), reddish brown; antennae and legs light brown. Head proportionally large, sub-quadrangular but longer than wide, with largely rounded posterior angles. Eyes of medium size and scarcely protruding. Surface with traces of transverse micro-striation and with very sparse puncturation. Pronotum massive, as long and wide as head. Surface with traces of more or less oblique micro-striation, with a dorsal series of 5 punctures and lateral series of 3 punctures. Elytra short, wide, scarcely longer than pronotum. Surface rugose, with some spaced series of fine and sparse punctures. Abdomen with fine transverse micro-striation and fine and sparse puncturation. Tergite and sternite of the male genital segment as in Figs 42-43. Aedeagus (Fig. 44) 0.7 mm long, with characteristic distal structure and inner sac with two big spines.

Sexual dimorphism: Female is unknown.

Distribution: Only known from the type locality.

Note: The specimen bears the labels "*Mitomorphus levatis* sp. n., Type, H. Last det.", "Type" (on round label with red border). The species differs from all known *Metolinus* especially in the shape of the body and the structure of the inner sac of the aedeagus.

Andelis punctatus **sp. nov.**

Holotype ♂ MM, Papua, Eastern Highlands, Okapa Distr., Oiana, R. Hornabrook leg. 8.XII.1972.

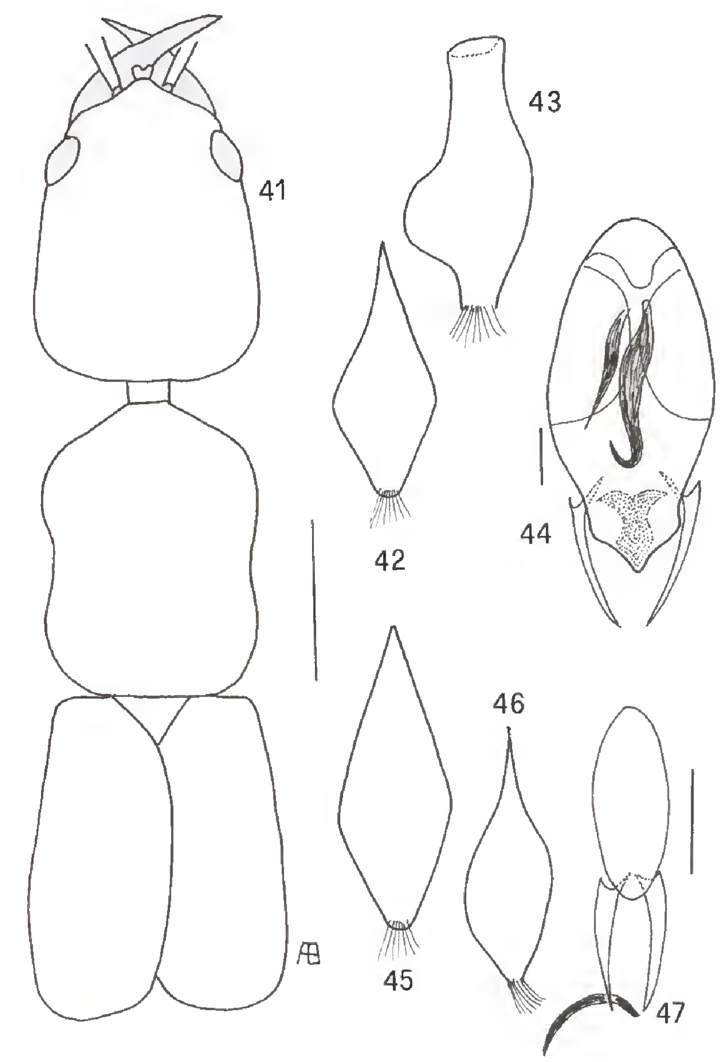
Paratypes 1♀ MM, same data as in holotype; 1♀ MM, 1♂ CBA, Frigano, R. Hornabrook leg. 28.XII.1974.

Derivatio nominis: The specific epithet is based on the Latin *punctatus* (with puncturation), in reference to the evident puncturation of the pronotum.

Description: Length of body: 4 mm; from anterior margin of head to posterior margin of elytra: 2.4 mm. Head black, pronotum, elytra, and abdomen reddish brown black, 6th visible abdominal segment, genital segment, antennae and legs yellowish. Head sub-rectangular, with scarcely rounded sides, largely rounded posterior angles. Eyes small and scarcely protruding. Surface with deep, and dense puncturation on the sides of the median band. Pronotum narrow, much narrower than head, as wide as the head, with very oblique anterior margins. Surface shiny, with traces of transverse micro-striation; evident puncturation on the sides of median band; the distance between the punctures is equal to their diameter. Elytra much longer and wider than pronotum, with marked humeral angles. Surface slightly rugose, with fine, superficial puncturation arranged in numerous series. Abdomen anteriorly with polygonal micro-reticulation and with fine and sparse puncturation. Tergite and sternite of the male genital segment as in Figs 45-46. Aedeagus (Fig. 47) very small, 0,3 mm long, with long, symmetrical parameres and long, very narrow distal sclerite.

Sexual dimorphism: The female is identical to the male in the external characters.

Distribution: Only known from the type locality.



Figures 41-47. New species of Xantholinini. 41-44: *Metolinus papuanus* sp. nov. 41- Forebody [scale bar 0.5 mm]; 42 – Tergite of the male genital segment; 43 – Sternite of the same; 44 – Aedeagus; 45-47: *Andelis punctatus* sp. nov. 45 – Tergite of the male genital segment; 46 – Sternite of the same; 47 – Aedeagus [scale bar 0.1 mm].

Note: The holotype bears the labels "*Mitomorphus punctatus* sp. n., H. Last det., Paratype", "Paratype" (on round label with yellow border); the other specimens have the same labels and one the label "Holotype" (on round label with red border). *Andelis punctatus* is the first species of this genus known from New Guinea. In the Australasian Region only one other species (*Andelis minutulus* Bordoni, 2010a) (Solomon Isl.) was known until now. The new species differs from all the taxa of this genus especially in the shape of the aedeagus.

***Phacophallus papuensis* (Fauvel, 1878)**

Examined material: 2 exx. MM, Papua, Panang, (R. Hornabrook leg. ?) 27.VI.1978.

Distribution: Philippines, Borneo, Sumatra, Bali, Lombok, Sumbawa (Bordoni 2002), New Guinea, Solomon Isl. (Bordoni 2010a).

***Mitomorphus punctatissimus* Bordoni, 2010a**

Examined material: 1♀ MM, 1♀ CAB, Papua, Okapa, Eastern Highlands, R. Hornabrook 6.II.1965.

Distribution: Papua (Herzog Mts., Wau, Rintobe) (Bordoni 2010a).

Note: The holotype of the species, as the first specimen listed here, bears the labels "*Xantholinus hornabrooki* sp. n.", "Type, H. Last det." (on round label with red border); the second listed specimen bears the labels "*Xantholinus papuensis* sp. n., Holotype, H. Last det.", "Type, H. Last det." (on round label with red border).

Acknowledgements

I wish to thank Dr. Dmitri Logunov (MM) for providing the material to this study, Dr. Dmitry Telnov (the Entomological Society of Latvia, Rīga) for accepting this contribution in the second book devoted to biodiversity and biogeography of New Guinea, and Guillaume de Rougemont (London, United Kingdom) for the help with the English version of this paper.

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A new species of leaf insect (Phasmida: Phylliidae) from West Papua, Indonesia

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Abstract: A new leaf insect species *Phyllium* (*Phyllium*) *telnovi* is described based on a single male specimen from the Tamarau Mountains, West Papua, Indonesia. An overview is also provided on leaf insect (Phylliidae) taxonomy.

Key words: Phasmida, Phasmatodea, *Phyllium telnovi* sp. nov., taxonomy.

Introduction

Leaf insects have always fascinated entomologists but have only been moderately well studied since 2000. This paper discusses a leaf insect found on a 2012 zoological expedition by the Entomological Society of Latvia to Indonesia (West Papua) (Plates 2-3) which has been found to be new to science, namely *Phyllium* (*Phyllium*) *telnovi* sp. nov. Including this new species, there are now fifty-two species of leaf insects (Phylliidae) in four genera (Brock 2013) from Australasia and South-East Asia. This is a substantial increase from the thirty-seven described species referred to only ten years ago (Brock, Hasenpusch 2003), reflecting recent work by several amateur phasmid specialists; there are also still undescribed taxa in some museum collections visited by the author. The Phylliidae is one of the smallest phasmid families, with just 1.7% of described phasmids (Brock 2013) but apart from introduced specimens i.e. as curiosities from sailors, they are limited to parts of two continents and are rather restricted in movement, as females cannot fly. Leaf insects are seldom recorded not only because of their camouflage, but it is likely that some species reside in the canopy of trees, hence sometimes only males are known, which are good fliers and are occasionally attracted to lights.

Recent research on Phylliidae

There have been the following recent notable papers and books on leaf insects, prior to this the only detailed publication in the last century was Klante (1976):

Brock & Hasenpusch (2003): A revision of Australian species, clarifying confusion in the literature regarding the identity of species.

Grösser (2001, 2008): A popular book [in German] on Phylliidae, with much effort made to illustrate adults and eggs.

Zompro & Grösser (2003): A generic revision.

Hennemann et al. (2009): A revision of species from the Philippines and reclassification, including clarification of several identifications.

Material and Methods

The holotype is deposited in the Natural History Museum, London collection. It has been compared with all Phylliidae, either by examination of type material (including reference to type photographs in Brock 2013) or literature.

In view of detailed revisions (see recent research above) no keys are provided in this paper.

Acronyms used in the text:

BMNH – The Natural History Museum, London, United Kingdom.

Description

Phylliidae Illiger, 1798

***Phyllium* (*Phyllium*) Illiger, 1798**

Type species: *Gryllus siccifolius* Linnaeus, 1758 (= *Phyllium siccifolium*), by original monotypy.

For full details, see Brock (2013), for diagnosis and keys, Hennemann et al. (2009).

***Phyllium* (*Phyllium*) *telnovi* sp. nov.** (Plates 2-3)
Holotype ♂ BMNH(E)#845382, INDONESIA E, West Papua, Tamarau Mts, Fef vill. ~ 11 km W, 00°46'12"S, 132°19'56"E, ~800 m, 13.II.2012, primeval lowland rainforest, MV light, leg. D.Telnov.

Derivatio nominis: Named after the collector, the well-known coleopterist Dmitry Telnov (Latvia).
Measurements: Holotype ♂: Body length 50 mm, head 3.1 (width 2.9 mm), antennae 32 mm, pronotum 2.9, mesonotum 3, metanotum 3 (+ median segment 2 mm), forewing 16 mm, hindwing 40 mm, femora: fore 10 mm, mid 10 mm, hind 10 mm; tibiae: fore 6 mm, mid 6 mm, hind 7 mm. Cerci 2 mm.
Description of male: Yellowish green insect (green when alive, with brown patches on fore legs and mid femora) Distinguished from other *Phyllium* species by the conspicuous shape of the abdomen; fore tibiae also with larger teeth on the interior lobe than in other related species in the *P. siccifolium* group. Head: Marginally longer than broad, eyes large and dark brown. Three ocelli present. Antennae with 23 segments, basal segment flattened and broadened, segment 2 short. Segments 3-19 much gradually increasing in length, with long black hairs (longer than width of segment). Segments 20-23 are shorter than previous segments, with short hairs. Thorax: Pronotum a little shorter than head and slenderer, with bold central line and median depression. Mesonotum and metanotum smooth, about the same length as pronotum, but mesonotum broadened towards hind part, as is typical in male leaf insects. Upper ridge of mesonotum with 5 well spaced teeth laterally, decreasing in size towards posterior. There are 7 well spaced teeth laterally on lower ridge, with smaller teeth beneath. Metanotum broadening to abdomen. Abdomen: Distinctly shaped, segment 3 with a slightly curved base, very broadened rounded 4th segment, tapering sharply to segment 6, then narrowed significantly in segment 7, still tapering to anal segment, which is rounded at tip. Cerci fairly stout, leaf-like. Vomer tapered to a pointed tip. Wings: Forewings elongate, leaf-like, exceeding end of second abdominal segment. Hindwings long, translucent; reaching beyond end of 9th abdominal segment. Subgenital plate broad, tip rounded. Legs: Characteristic of the genus, with large triangular lobes interior and exteriorly. Interior lobes of fore femora with five spines anteriorly (resulting in unusually large 'u' shaped gaps), the central spine being very short. The lobe is more than half length of the fore femur The mid and hind femora have minute spines anteriorly; almost half of mid femur brown posteriorly, with brownish banding near teeth of fore femur and on lobe of fore tibia. The fore tibiae lack an exterior lobe.
Sexual dimorphism: Female not known, but from the author's evaluation of other taxa, is expected to have a very rounded abdomen.
Diagnosis: Closely related to *Phyllium* (*Phyllium*) *siccifolium* (Linnaeus, 1758) and placed in the *Phyllium siccifolium* group [the distribution range of *P. siccifolium* is Moluccas: Halmahera, Ambon, Seram, Sula Islands, Banggai Island and Buru (Hennemann et al. 2009), although further research may be needed on the distribution range as this involves Indonesian islands separated by deep water straights. Grösser (2011)] has already disputed the arrangement (see 'Discussion' section). *P. telnovi* differs from *P. siccifolium* by the considerably more broadened abdomen and distinct 'u' shaped gaps on interior lobes of fore femora. It is interesting that out of 28 described *Phyllium* (*Phyllium*) species, only three other species are recorded from 'New Guinea', i.e. *P. caudatum* Redtenbacher, 1906 (New Britain, Papua New Guinea, Solomon Islands), *P. elegans* Grösser, 1991 (North New Guinea) and *P. zomproi* Grösser, 2001 (Aseki, Morobe Province, Papua New Guinea), whereas six of the 12 *Phyllium* (*Pulchriphyllium*) species are from 'New Guinea' (mostly Papua New Guinea), with some other species found in nearby islands.
Ecology: This species was collected in lowland primary rainforest at mercury-vapour light.
Distribution: so far only known from the type locality, the Tamarau Mountains, West Papua, Indonesia.

Discussion

There is disagreement over taxonomy of certain *Phyllium* species, with a history of misidentifications, repeated descriptions of the same species and general confusion (there are 52 species of Phyllidae, many described from a single specimen, yet there are another 21 invalid species names (Brock 2013)). For example, *Phyllium* (*Phyllium*) *tobeloense* Grösser, 2007 was regarded as a synonym of *Phyllium* (*Phyllium*) *siccifolium* by Hennemann et al. (2009) but returned to valid species status by Grösser, 2011, although doubts still remain over the correct placement, with a convincing discussion by Hennemann et al. (2009).

For the time being the species are separated in the online Phasmida Species File (Brock 2013), although this only reflects the most recent taxonomic change, pending further evaluation by specialists. There has been considerable confusion even by a basic distinguishing feature to place species in subgenera of *Phyllium* i.e. the presence (subgenus *Pulchriphyllium*) or absence (subgenus *Phyllium*) of exterior lobes on the fore tibiae, as clarified by Grösser (2008: 85) [assuming subgenera are even warranted]. Molecular phylogenetics such as DNA Barcoding would be useful in order to help solve such disputes, particularly with isolated island populations. However, the difficulty in obtaining even specimens of both sexes means this is unlikely, but a mindset change is also needed by phasmid enthusiasts to consider the potential benefits of molecular work alongside other taxonomic methodology. It is considered that DNA barcoding would work well with leaf insects, particularly isolated island populations and it is hoped that a scientist will take up the challenge in future, including providing maps of taxa (of little relevance at present, particularly with some species just known from 'New Guinea'). At present the range is unlikely to be accurate due to lack of material and misinterpretation of forms. However, from morphological studies it is believed the new species described from the Tamarau Mountains (an understudied location some considerable distance from other related species), differs significantly from species known from only one sex (frequent in Phylliidae) and adds to our limited knowledge of the Phylliidae from this vast region. The answer to other questions, such as are subgenera necessary and is the extensive range of some taxa correct, may be subject to debate by phasmid specialists for some time.

Acknowledgements

Thanks to Dr. Dmitry Telnov (the Entomological Society of Latvia, Rīga) for donating the holotype to BMNH and providing a habitat figure for this paper.

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Numerous other references for Phylliidae are available from Brock (2013).

Review of the Papuan millipede genus *Silvattia* Jeekel, 2009, with descriptions of three new species (Diplopoda: Polydesmida: Paradoxosomatidae: Eustrongylosomatini)

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Abstract: The oligotypic genus *Silvattia* Jeekel, 2009, which has hitherto been known to comprise only two species from New Guinea, is rediagnosed and shown to include further three species from Papua New Guinea: *Silvattia petarberoni* sp. nov., *S. perplexa* sp. nov. and *S. jeekeli* sp. nov. A key is given to all five species of the genus.

Keywords: Millipede, *Silvattia*, taxonomy, new species, key, New Guinea.

Introduction

The genus *Silvattia* Jeekel, 2009 has recently been proposed to incorporate two species: *S. horvathi* (Silvestri, 1899) (the type species), from Eriba, Astrolabe Bay, Madang Province, and Malu (incorrectly spelled as Matu, actually also being equal to Malu Ambunti or Male near Ambunti), East Sepik, both localities in Papua New Guinea, as well as *S. digulana* Jeekel, 2009, from Upper Digul, Papua Province, Indonesia (Jeekel 2009). The genus was assigned to the tribe Eustrongylosomatini and characterized by the paraterga being mostly missing, coupled with the gonopods showing the femorite strongly expanded into a dorsal serrulate lamella and also equipped with an apical transverse spine, while the solenophore being elongate, ribbon-like and carrying a small spine at midway.

Prompted by the discovery of a small material of *Silvattia* Jeekel in the collection of Diplopoda from Papua New Guinea, housed in the National Museum of Natural History, Sofia (NMNHS), we present here an amended diagnosis of the genus to incorporate three new species described below. In addition, a key is provided to all five species of *Silvattia* known to date.

This is our fifth joint publication dealing with millipedes from Papua New Guinea, based on the collections of Petar Beron taken in 1975 by the British Speleological Expedition (see also Golovatch and Stoev 2009, 2010, 2011, Golovatch et al. 2010). The expedition focused on the exploration of caves in the region of Telefomin and the neighbouring Finim Tel Plateau, Bahrman Range, situated north of the Hindenburg Wall. A detailed description of the region, its geological and climatic characteristics and the expedition's results can be found in Brook (1976). Nearly all type material is deposited in the collection of NMNHS, with only a single paratype donated to the Zoological Museum, Moscow State University, Russia (ZMUM), as indicated hereafter.

Taxonomical part

***Silvattia perplexa* sp. nov.** (Figs 1-8, plate 4, fig. 1)

Holotype ♂ NMNHS, **Papua New Guinea**: West Sepik Province, Telefomin area, 1700 m, September 1975, leg. P. Beron.

Derivatio nominis: To emphasize the particularly complex gonopod femorite and solenophore.

Diagnosis: The gonofemorite and solenophore of this new species are both remarkably complex as compared to all known Eustrongylosomatini.

Description: Length *ca* 21 mm, width of midbody pro- and metazona 1.5 and 1.9 mm, respectively. Coloration generally brown to dark brown; antennae dark brown, growing increasingly infuscate towards antennomere 6; legs and sterna light brown; collum with a small median greyish spot in anterior third;

following segments with similar light grey bands extending from about ozopore level dorsally in front halves (Plate 4, fig. 1). Telson with a similar, but smaller spot mid-dorsally. In width, head = segments 2 and 3 > collum < 4 < 5 = 17, thereafter body gently tapering towards telson. Front half of head densely setose, caudal half bare. Antennae short, slightly clavate, reaching behind collum when stretched dorsally; antennomere 2 longest, slightly longer than 6th, the latter highest and only slightly longer than subequal antennomeres 3-5; antennomere 7 shortest. Paraterga nearly wanting on collum, small flaps, rounded both anteriorly and posteriorly, in segment 2, very small and rounded ridges delimited by a very faint sulcus only dorsally in segments 3-5; onwards until segment 19 faint, transverse, rounded bulges increasingly poorly developed towards telson (Fig. 1, plate 4, fig. 1). Ozopores small, but evident, lying laterally in caudal quarter of paraterga (Fig. 1). Tergal setae missing, setation pattern untraceable. Body slightly moniliform, transverse metatergal sulcus totally missing. Tegument smooth and shining. Stricture between pro- and metazona almost smooth, deep, only sometimes very faintly striolate. Pleurosternal carinae missing. Sternites densely setose, cross impression evident. Epiproct moderately emarginated, lateral pre-apical papillae very small (Fig. 2). Hypoproct subtrapeziform, caudal setae strongly separated, placed on minute knobs (Fig. 3). Sternal lobe between coxae 4 missing, with 2+2 bunches of setae instead (Fig. 4). Legs rather short and stout, about as long as midbody height, tarsal brushes absent only from last two leg-pairs. Gonopods highly complex (Figs 5-8). Coxa with a few setae distoventrally, rather short, much shorter than telopodite. Prefemoral part short, as usual, densely setose; femorite only slightly longer than solenophore, but strongly expanded, with a distinct sublateral arm (**k**) and several folds, distal part with two distinct spines: **a** longer and subflageliform, **b** short, stout and dentiform. Subapical part of solenophore (**x**) tripartite, unusually complex.

Silvattia petarberoni **sp. nov.** (Figs 9-14, plate 4, fig. 2)

Holotype ♂ NMNHS, **Papua New Guinea**: West Sepik Province, Telefomin, 1600 m, 2 August 1975, leg. P. Beron.

Derivatio nominis: Honours Petar Beron, the famous Bulgarian naturalist who collected all material treated in this paper.

Diagnosis: Differs from all species of this genus in the absence of any outgrowths in the distal part of the gonofemorite and by the peculiar shape of the solenophore.

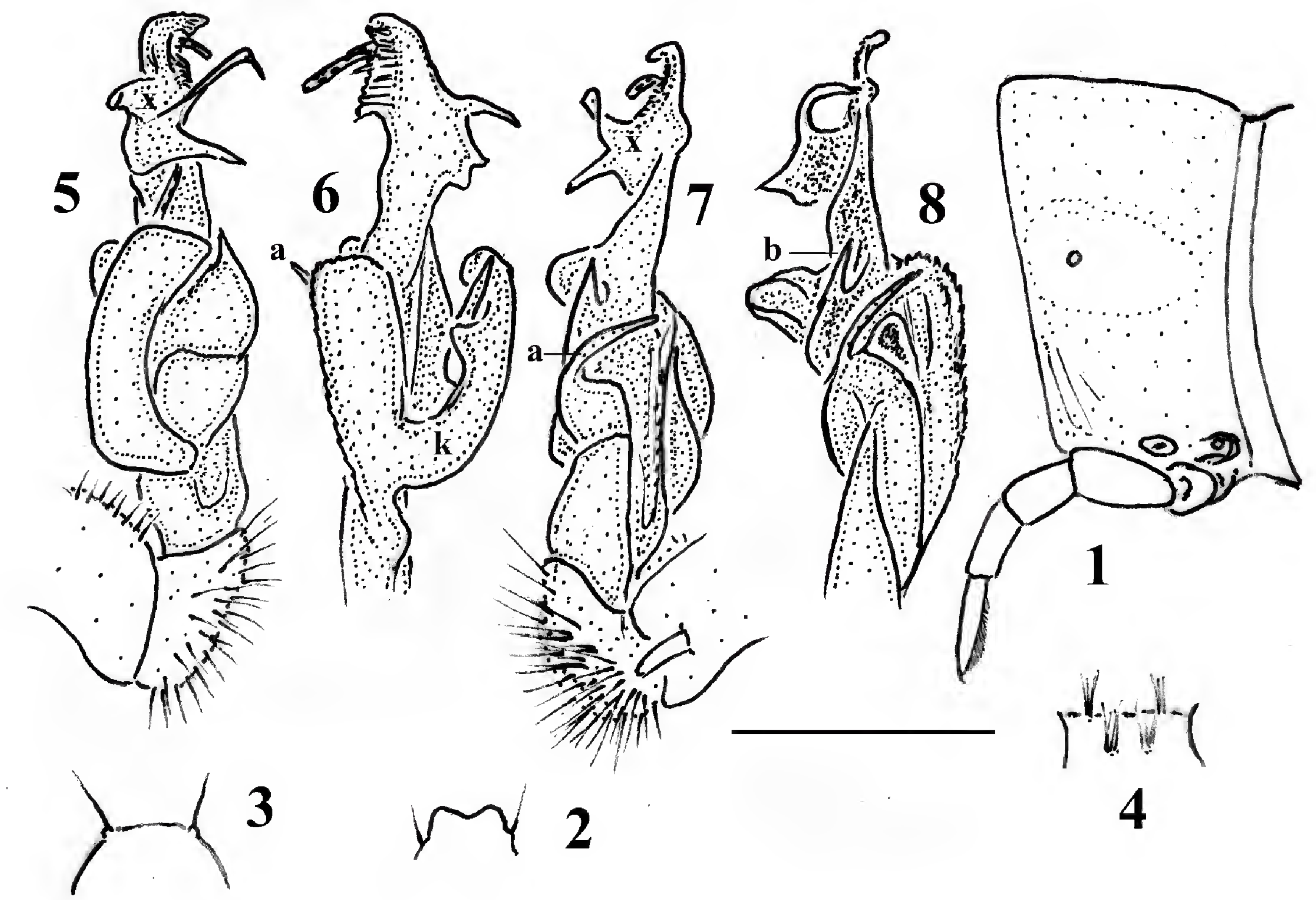
Description: Length *ca* 22 mm, width of midbody pro- and metazona 1.5 and 1.9 mm, respectively. All characters like in *S. perplexa* sp. nov., except as follows. Coloration generally dark brown with light greyish paraterga and a rather wide, oblong axial spot on all metaterga, including collum and telson (the latter without lateral spots). Antennae a little slenderer, reaching behind until midway of segment 2 when stretched dorsally; antennomere 6 longest and highest, slightly longer than subequal antennomeres 2-5 (Plate 4, fig. 2). In width, head = 5-17 > collum > 2-4, thereafter body gently tapering towards telson. Paraterga nearly wanting on collum, small flaps, rounded both anteriorly and posteriorly, in segment 2, very small and rounded ridges delimited by a very faint sulcus only dorsally in segments 3-4; onwards until segment 18 faint longitudinal bulges increasingly poorly developed towards telson (Fig. 9, plate 4, fig. 2). Axial line barely traceable. Legs longer and slenderer, about 1.3 times as long as midbody height, tarsal brushes gradually reduced towards legs of segment 14. Stricture between pro- and metazona faintly striate dorsally. Epiproct very poorly concave at tip, small lateral pre-apical papillae and similarly small dorsal papillae (Fig. 10). Hypoproct subtrapeziform (Fig. 11). Sternal lobe between coxae 4 very evident, linguiform, densely setose apically (Fig. 12). Gonopods much like in *S. perplexa* sp. nov., but far less strongly elaborate (Figs 13-14); femorite shorter than solenophore, strongly expanded, with two distinct lobes on mesal side (***l1*** and ***l2***); ***l1*** serrate, ventral, while ***l2*** smooth, larger and dorsal; distal part of femorite devoid of any outgrowths, solenophore subcircular, with a distinct ventral spine (**v**) and a dorsal lobe (**y**) near midway. Tip of solenophore a simple ribbon.

Silvattia jeekeli **sp. nov.** (Figs 15-26, plate 4, figs 3-4)

Holotype ♂ NMNHS, **Papua New Guinea**: West Sepik Province, Tifalmin, 14.IX.1975, leg. P. Beron.

Paratypes 8 specimens: 2♂ & 1♀ NMNHS, 1♂ ZMUM, same locality, date and collector as in holotype; 1♂ NMNHS, Telefomin area, 1700 m, September, 1975, leg. P. Beron; 1♂ & 1♀ NMNHS, Chimbu Province, village of Goglme, Cave Ogon I, 1975, leg. P. Beron; 1♂ NMNHS, Western Province, Finim tel, 2300 m, 19 August 1975, leg. P. Beron.

Derivatio nominis: Honours the late Casimir Willem Jeekel, an outstanding specialist in diplopod

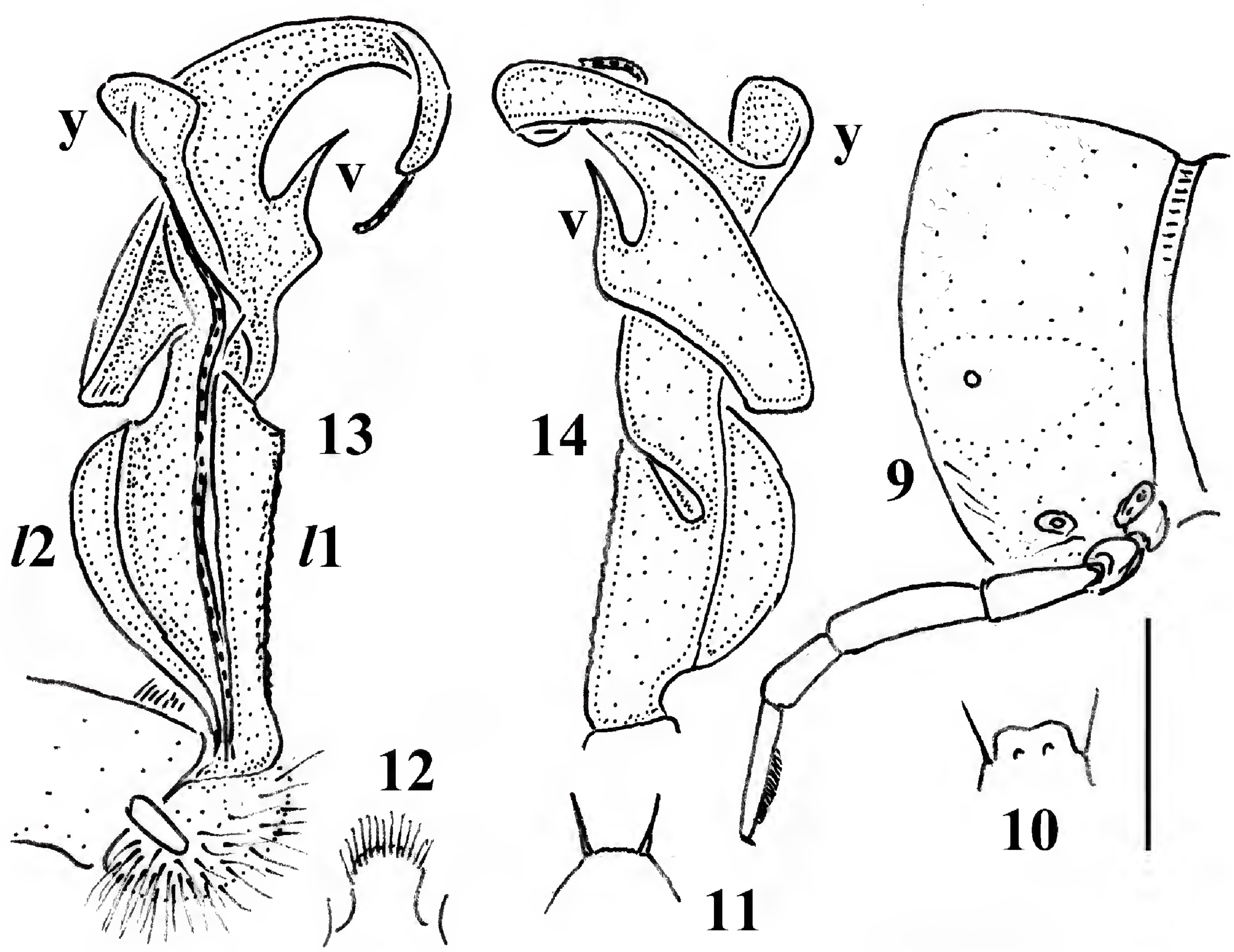


Figures 1-8. *Silvattia perplexa* sp. nov., holotype. 1 – Segment 10, lateral view; 2 – Tip of epiproct, dorsal view; 3 – Hypoproct, ventral view; 4 – Sternum between coxae 4, ventral view; 5-8 – Right gonopod, lateral, dorsal, mesal and subventral views, respectively [scale bar 1.0 mm (Figs 1-4) and 0.5 mm (Figs 5-8)].

taxonomy.

Diagnosis: Differs from other congeners by the characteristic colour pattern, long legs, combined with the peculiar shapes of the relatively slender gonofemorite and the small distogonofemoral process, as well as by the peculiar shape of the solenophore.

Description: Length 23-26 (♂) or 25-28 mm (♀); width 1.7-2.0 and 2.0-2.5 mm (♂) or 2.4-2.7 and 2.8-3.0 mm (♀) of midbody pro- and metazona, respectively. Length of holotype *ca* 24 mm, width of midbody pro- and metazona 2.0 and 2.3 mm, respectively. All characters like in *S. perplexa* sp. nov., except as follows. Coloration blackish brown to brown with a vivid pattern (Plate 4, fig. 3); collum usually with a rather narrow, axial, horologiform, greyish spot running from front to caudal margin and merging frontally with a similarly narrow band along front margin and extending onto paraterga. Subsequent metaterga with a large, central, transverse, greyish band extending from near stricture to caudal edge, often extending down like a narrow ribbon to merge with similarly grey paraterga; epiproct also grey. In the paratype from Finim tel, pattern slightly different (Plate 4, fig. 4): central spots on collum and subsequent metaterga taking up entire dorsal surface, but paraterga remaining dark. Legs and antennae blackish to dark brown. In width, head = collum = segment 3 < 4 < 2 = 5 = 17, or head = segment 5 = 16 > 2 > 3 > 4 > collum (♂♂); head < collum = segment 3 = 4 < 2 < 5 = 17 (♀♀). Antennae reaching behind segment 2 (♂♂) or collum (♀♀) when stretched dorsally; antennomere 6 longest and highest, sometimes subequal in length to antennomere 2 or to each of antennomeres 3-5. Paraterga poorly developed, but visible in segments 2 and 3(4) due to a dorsal sulcus, this also being barely traceable in segment 5; following paraterga increasingly poorly developed, longitudinal, rounded bulges until segment 17 or 18 (Figs 15, 21, plate 4, fig. 3). Epiproct deeply emarginated between apical papillae, subapical lateral papillae very small (Figs 16, 22). Hypoproct subtrapeziform (Fig. 17, 23). Stricture between pro- and metazona very finely striolate to smooth, sternal lobe between coxae 4 linguiform, densely setose apically (Figs 18, 24). Axial line barely traceable to absent. Legs either long and slender,



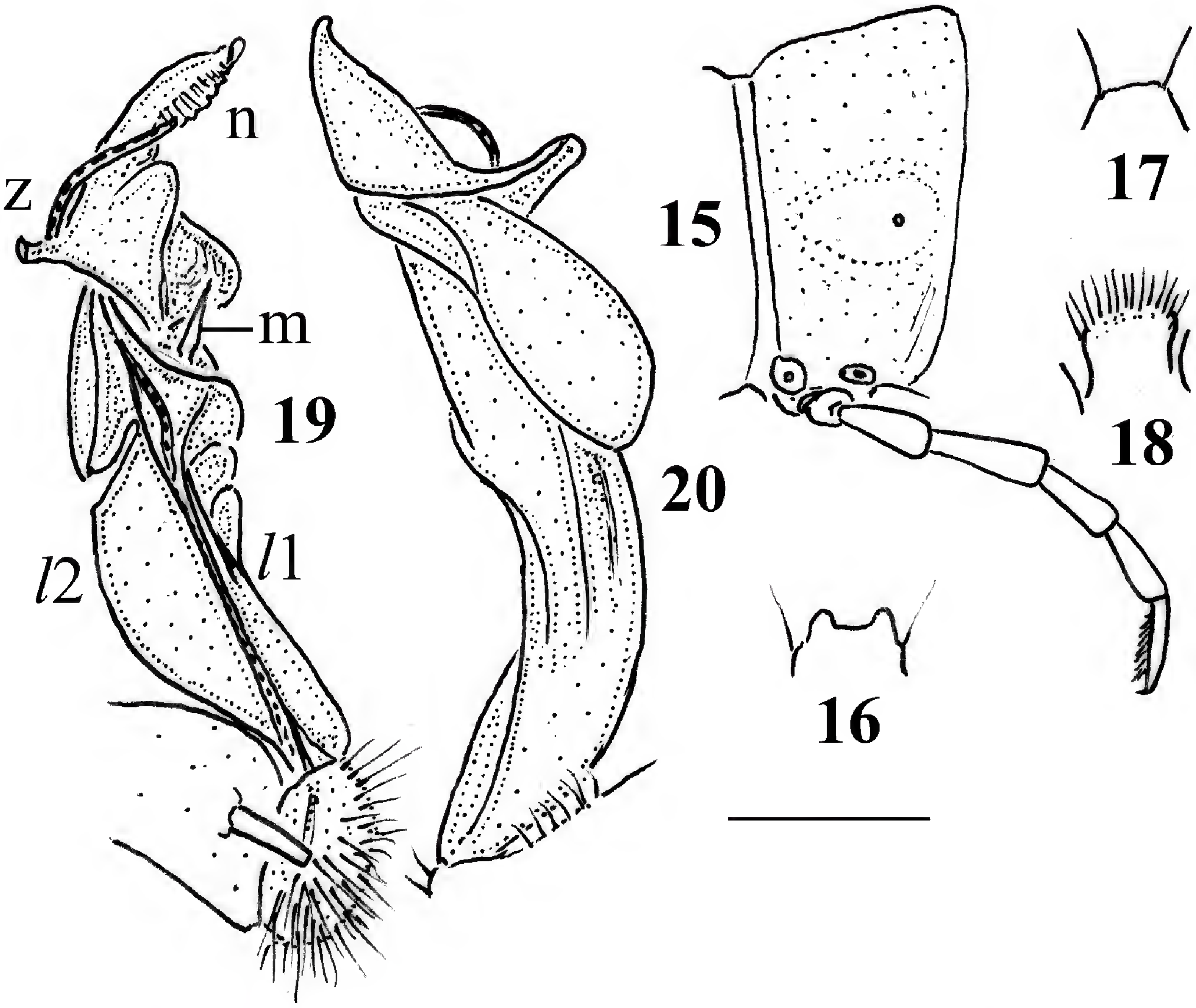
Figures 9-14. *Silvattia petarberoni* sp. nov., holotype. 9 – Segment 10, lateral view; 10 – Tip of epiproct, dorsal view; 11 – Hypoproct, ventral view; 12 – Sternal lobe between coxae 4, ventral view; 13-14 – Left gonopod, mesal and lateral views, respectively [scale bar 1.0 mm (Figs 9-12) and 0.5 mm (Figs 13-14)].

ca 1.3 times longer than midbody height (♂♂), or short and slender, 0.9 times longer than midbody height (♀♀). Gonopods showing slight variations in different structures (Figs 19-20, 25-26). Femorite rather slender (Figs 19-20, 25-26), about as long as solenophore, lateral face distinctly folded; lobe ***l*1** narrow, lobe ***l*2** not as strongly expanded as in other congeners; distofemoral process (**m**) short and slender; midway process (**z**) of solenophore slender and unciform. Tip of solenophore with a serrulate lobe (**n**).

Position of *Silvattia* Jeekel, 2009 within Eustrongylosomatini

The tribe Eustrongylosomatini contains only a few genera (Jeekel 1968) which mainly occur in New Guinea and adjacent areas. Only one genus, the monobasic *Diglossosternoides* Golovatch, Korsós, 1992, is endemic to the Seychelles (Golovatch & Korsós 1992). The largest and most widespread is *Eustrongylosoma* Silvestri, 1896, which contains more than 30 described and a number of undescribed species ranging from Borneo and the Philippines in the west, to Micronesia in the north, and to Melanesia and New Guinea in the east (Golovatch & Stoev 2011, 2013; Golovatch & Geoffroy 2013).

To properly incorporate the above three new species, several amendments to the diagnosis of *Silvattia* as quoted above appear to be necessary. For example, the presence of one or more distofemoral outgrowths on the gonopod is not obligatory, these structures being absent from *S. petarberoni* sp. nov. In this respect *Silvattia* fails to differ from *Eustrongylosoma*. Most of *Eustrongylosoma* species are devoid of distofemoral processes other than the usual apicolateral lobe, but a few show quite prominent distal processes, e.g. *E. exiguum* Hoffman, 1978, from Papua New Guinea, *E. kuekenthali* (Attems, 1897), from Borneo and Sulawesi, and *E. penevi* Golovatch, Stoev, 2013, from Luzon, Philippines (Hoffman 1978;



Figures 15-20. *Silvattia jeekeli* sp. nov., ♂ paratype from Telefomin. 15 – Segment 10, lateral view; 16 – Tip of epiproct, dorsal view; 17 – Hypoproct, ventral view; 18 – Sternal lobe between coxae 4, ventral view; 19-20 – Left gonopod, mesal and lateral views, respectively [scale bar 1.0 mm (Figs 15-18) and 0.45 mm (Figs 19-20)].

Golovatch 1997; Golovatch & Stoev 2013). A long distogonofemoral process is also characteristic of *Diglossosternoides*.

As regards the presence in the gonofemorite of a large dorsal serrulate lobe as quoted above, it can likewise be non-serrulate and rather modest, e.g., in *S. jeekeli* sp. nov. In this respect *Silvattia* again fails to differ from numerous *Eustrongylosoma* species.

The last gonopod trait quoted above concerns the presence in *Silvattia* of a midway process on the solenophore. This structure also appears too variable to be considered of generic importance. One or more processes are located in various places on the solenophore in all three new species. In addition, numerous *Eustrongylosoma* species have one or two similar structures on the solenophore (Golovatch & Stoev 2011).

The underdeveloped paraterga in *Silvattia* do not hold either, as the same condition is also observed, e.g., in *E. pallidum* Golovatch, Stoev, 2011, *E. prodelum* (Chamberlin, 1945) and *E. maculatum* Golovatch, Stoev, 2011 (Golovatch & Stoev 2011). However, *Silvattia* does show several traits that define this genus against *Eustrongylosoma*, probably the closest among allies. Such is the relatively short, stout and elaborate gonopod femorite often, but not always, bearing a distal process, as well as again sometimes, but not always a particularly hypertrophied dorsal lobe. In addition, the solenophore in *Silvattia* carries at least two distinct outgrowths, being more elaborate than in *Eustrongylosoma*. The underdeveloped paraterga is still another character that defines the genus against most, but not all, species of *Eustrongylosoma*. We may soundly suggest that, due to a whole number of presumably derived conditions such as the paraterga strongly reduced and certain parts of the gonopod especially elaborate, *Silvattia* represents an evolutionary summit among the genera of Eustrongylosomatini.

A new diagnosis of *Silvattia* is thus necessary.

***Silvattia* Jeekel, 2009**

Diagnosis: A genus of Eustrongylosomatini with 20 segments and a normal ozopore formula. Paraterga 6-17(18) longitudinal rounded bulges increasingly poorly developed towards telson. Gonopod femorite relatively short, stout and elaborate (about as long as solenophore), sometimes with a marked dorsal lobe and often with a distal process. Solenophore also elaborate, suberect to subcircular, bearing at least two distinct processes in various places.

Type species: *S. horvathi* (Silvestri, 1899), by original designation.

Key to species of *Silvattia*

1 Size small, midbody metaterga 1.1-1.2 mm wide, transverse sulcus present in segments 5-18; gonopod with a distal femoral process directed transversely 2

- Size larger, midbody metaterga at least 1.9 mm wide; transverse metatergal sulcus absent; gonopod with a distal femoral process directed distad 3

2 Colour pattern: dark chestnut brown with a yellow to yellowish brown dorsal band in front of metatergal sulcus present only in posterior segments; distogonofemoral process rather short, solenophore elaborate only near tip .... *S. digulana*

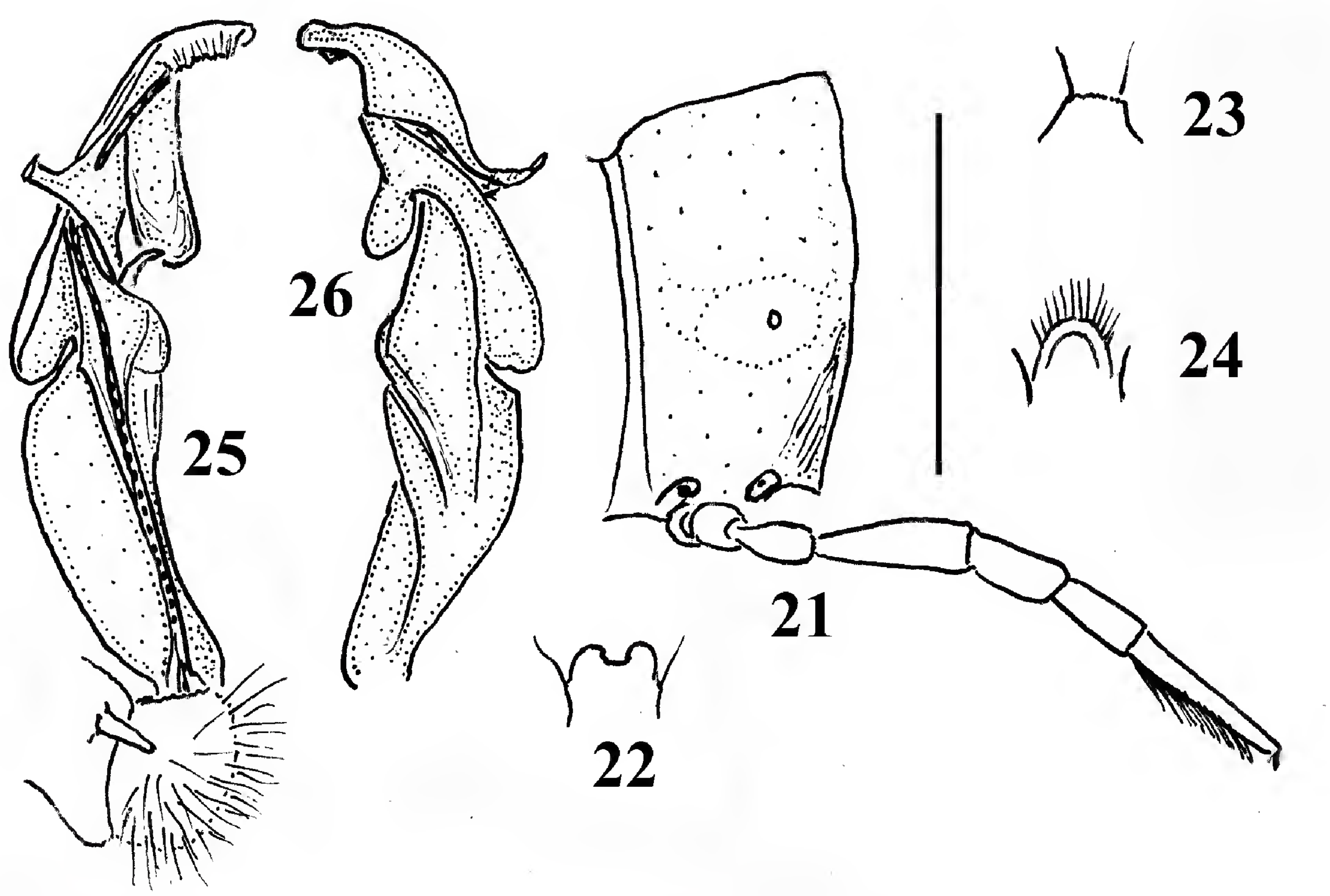
- Colour pattern: red-brown with a yellowish dorsal band in front of metatergal sulcus in all segments, segments 2-5 and 19 with a similar central spot also on prozona; distogonofemoral process long, about 0.5 times as long as femorite, solenophore with a midway process, tip less elaborate .... *S. horvathi*

3 Sternal lobe between male coxae 4 missing, with 2+2 bunches of setae instead (Fig. 4); legs rather short and stout, about as long as midbody height (♂) (Fig. 1); gonopods highly complex (Figs 5-8), femorite with a distinct sublateral arm (k) .... *S. perplexa* sp. nov.

- Sternal lobe between male coxae 4 present; legs longer and slenderer, about 1.3 times as long as midbody height (♂); gonopods less elaborate, sublateral arm on femorite absent (Figs 13, 25) 4

4 Epiproct very poorly concave at tip (Fig. 10); gonopods as in Figs 13 and 14 .... *S. petarberoni* sp. nov.

- Epiproct deeply emarginated between apical papillae (Figs 16, 22); gonopods as in Figs 19, 20, 25 and 26 .... *S. jeekeli* sp. nov.



Figures 21-26. *Silvattia jeekeli* sp. nov., ♂ paratype from Cave Ogon I. 21 – Segment 10, lateral view; 22 – Tip of epiproct, dorsal view; 23 – Hypoproct, ventral view; 24 – Sternal lobe between coxae 4, ventral view; 25-26 – Left gonopod, mesal and lateral views, respectively [scale bar 1.0 mm (Figs 21-24) and 0.5 mm (Figs 25-26)].

Figure 27. Distribution of *Silvattia* species in New Guinea. 1 – *S. horvathi*; 2 – *S. digulana*; 3 – *S. petarberoni* sp. nov., *S. perplexa* sp. nov., *S. jeekeli* sp. nov.; 4 – *S. jeekeli* sp. nov.

Conclusions

The distribution pattern of *Silvattia* species in New Guinea seems to be rather sporadic, albeit all three new species occur sympatrically at least at Telefomin. In addition, four species seem to be confined to the western part of the island (Fig. 27). However, admitting so many lacunae existing in our knowledge of the Papuan millipede fauna, revealing many more congeners would be hardly surprising, including those in the eastern parts of New Guinea.

Acknowledgements

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To the knowledge of Macroheterocera of Southeast Asia and New Guinea. I. Snouted Tiger moths (Lepidoptera: Aganaidae) of Papua Province, Indonesia

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Abstract: A small collection containing eight species of snouted tiger moths, family Aganaidae (Lepidoptera: Noctuoidea), from the western part of the island of New Guinea is presented and illustrated. Bibliography of this group is discussed. Synonymy is given.

Key words: Lepidoptera, Aganaidae, Indonesia, Papua Province, New Guinea.

Introduction

The present article begins a series of publications dealing with Macroheterocera (Lepidoptera) of Southeast Asia and New Guinea. A rather abundant material for the series has been collected by the authors and our colleagues in various places of this highly interesting region. The first publication is devoted to the snouted tiger moths (Lepidoptera: Aganaidae) of the Indonesian part of the island of New Guinea. The material was collected by the second author and V.V. Sinyaev ("Eco-Design Studio", Moscow, Russia) in the following three localities of Papua Province from the late December of 2008 to the beginning of February 2009.

Collecting site 1 (Plate 5 figs 1-2) is an agricultural land in the foothills of Cyclops Mountains, with remnants of a primary forest on steep slopes and a secondary vegetation in the floodplain, cocoa plantations, banana and vegetable crops. The exact locality is as follows: Indonesia, W New Guinea, Papua, Sentani env., Cyclops Mts., 02º32'S, 140º28'E, ca. 300 m a.s.l., 26-29.XII.2008 and 03-06.II.2009.

Collecting site 2 (Plate 5 figs 3-4) is a primary rain forest on the slopes with local fellings for vegetable gardens. The exact locality is the following: Indonesia, W New Guinea, Papua, Genyem env., 02˚38'S, 140˚10'E, ca 500 m a.s.l., 30.XII.2008-02.I.2009 and 25.I-02.II.2009.

Collecting site 3 (Plate 5 figs 5-6) is a lowland primary rain forest in a valley, sometimes boggy, with an abandoned village on the river bank. The exact locality is as follows: Indonesia, W New Guinea, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, ca. 60 m a.s.l., 05-16.I.2009.

Up to now there has been no consensus among researchers as to the status of this group and its place in the classification of Lepidoptera. It has been assigned either to Lithosiidae (Snellen 1888) or Arctiidae (Seitz 1914; Watson 1980), or Noctuidae (Holloway 1988), or referred to as a distinct family (Inoue et al. 1982; Speidel et al. 1996; Kuznetzov, Stekolnikov 2001). Now, based on the results of chemical and molecular studies (Zahiri et al. 2010, 2012), this group is being placed in the rank of a subfamily in the Erebidae Leach, 1815.

Here we do not intend to address the problems of the systematics of higher taxa of Lepidoptera, yet we consider it necessary to give our opinion concerning the study methods and their application to taxonomic issues. Certainly, we agree that all currently used classifications of Lepidoptera have the right to exist, but at the same time any student is free to choose and use the system he or she considers the most adequate.

Regarding the classification of the Noctuoidea proposed by Zahiri et al. (2010, 2012), both their cluster analysis and all of its modifications have certain drawbacks and limitations. In particular, the composition and number of clusters depends on the criteria selected for analysis. Besides this, the application of different methods of cluster analysis for different data of a certain range of objects can lead to very different results. Furthermore, despite the fact that cluster analyses use a hierarchical strategy in their calculations, this hierarchy is not what is meant in the hierarchical taxonomy of biological objects where all taxa are strictly ranked. One should also keep in mind that the sequence of nucleotides in the DNA macromolecule is not yet a biological organism. Therefore, the phylogenetic hypothesis proposed by Zahiri et al. (2010, 2012) on the basis of a cluster analysis of DNA sequence data of a few genes can be taken as only one of the possible, whereas the taxonomic rank of the clusters remains purely subjective. Observing this group of moths in nature, we can agree neither with Minet (1986) and Holloway (1988) nor with Zahiri et al. (2010, 2012), following instead the opinion of Speidel et al. (1996) and Kuznetzov & Stekolnikov (2001) who regard Aganaidae as a distinct family of Noctuoidea.

Because the species of Aganaidae are widespread and most of them have subspecies or forms, we have restricted the synonymy lists mainly to the taxa which have been described from New Guinea and neighbouring archipelagos. In addition, we exclude all homonyms and infrasubspecific names. All of the synonyms in the text are given in the quotation marks because they have been checked in original publications.

At present, only 11 Aganaidae species from four genera have been reported from the island of New Guinea (Zwier 2011). We have found eight species representing three genera. All of them have been taken from new localities, thus providing new faunistic records. All taxa mentioned and illustrated herein are housed in the collection of the second author.

Key to the genera of Aganaidae Boisduval, 1833 (Lepidoptera: Noctuoidea) of Papua Province, Indonesia based on external characters

1 Alar expanse less than 30 mm; forewing sepia-brown with a broad, irregular greyish-white band, spotted here and there with brown .... *Digama* Moore, 1860 (*D. marmorea*)
– Alar expanse more than 35 mm; forewing pattern different 2
2 Forewing bright yellow with a few light brown spots; hindwing entirely bright yellow .... *Agape* Felder, 1875 (*A. chloropyga*) (Plate 6 figs 1-2)
– Fore- and hindwing with different colour pattern 3
3 Forewing grey with strong blue sheen, with white to dirty-white veins; hindwing white with a broad black with strong blue sheen outer margin, with a large black discal spot .... *Neochera* Hübner, 1819 ["1816"] (*N. dominia*) (Plate 6 figs 3-4)
– Forewing yellow, brown, dark brown or black with spotted or longitudinal pattern type; hindwing without a large black discal spot .... *Asota* Hübner, 1819 ["1816"]

List of the Aganaidae Boisduval, 1833 (Lepidoptera: Noctuoidea) of Papua Province, Indonesia

Genus ***Agape*** **Felder, 1875** [1]
"*Agape* ..." - Felder R. in Felder C., Felder R. & Rogenhofer 1875: [1], Tab. 106, Fig. 4. Type species: *Agape cyanopyga* Felder, 1875 [= *Hypsa chloropyga* Walker, 1854], by monotypy.
= "*Spilobotys*, gen. nov." - Butler 1887b: 123. Type species: *Spilobotys arctioides* Butler, 1887, by monotypy.

Note: A small genus comprising only up to five species.
Distribution: The Oriental and Australian regions from India in the west and southern China in the north to northern Australia and Vanuatu in the south and southeast.

Agape chloropyga **(Walker, 1854)** (Plate 6 figs 1-2)
"*Hypsa chloropyga*." - Walker 1854: 455. Type locality: "Australia".
= "*Hypsa analis*." - Walker 1856: 1677. Type locality: "Ceram" [= Indonesia, Moluccas, Seram Island].
= "*Agape cyanopyga* F." - Felder R. in Felder C., Felder R. & Rogenhofer 1875: [1], Tab. 106, Fig. 4. Type locality: "Amboina (Doleschall), Luzon

1 – According to Higgins (1963), the publication date of fourth booklet (Helf 4) in the Lepidoptera section of the "Navara Reise" must be considered as January 5th, 1875, not 1874.

(Semper)" (explanation to the plates) [= Indonesia, Moluccas, Ambon Island; the Philippines, Luzon Island].
= "[*Agape*] *chloropyga* var. *snelleni* n. var." - Gaede 1914: 74. Type locality: "... aus Ceram" [= Indonesia, Moluccas, Seram Island].

Material examined: 3♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 6 figs 1-2), same locality, 25-26.I. 2009.
Note: The species cannot be confused with any other aganaid by the peculiar coloration of the forewing and abdomen. At present, the species is not divided into subspecies.
Distribution: This species is the most widespread in the genus, ranging from India in the west, southern China in the north, northern Australia in the south and the Solomon Islands in the east.

Genus ***Neochera*** **Hübner, 1819 ["1816"]**
"*Neochera* ..." - Hübner 1819 ["1816"]: 173. Type species: *Phalaena dominia* Cramer, 1780, by subsequent designation by Kirby (1892: 389).
= "*Philona*." - Walker 1854: 456. Type species: *Hypsa inops* Walker, 1854, by monotypy.

Note: A small genus consisting of four species only.
Distribution: The Oriental and Australian regions from the state of Sikkim in India in the west to Papua New Guinea in the east, and from the province of Hubei, China in the north to the central parts of Australia in the south.

Neochera dominia **(Cramer, 1780)** (Plate 6 figs 3-4)
"[*Phalaena*] *Dominia*." - Cramer 1780: 123, pl. 258, figs A, B. Type locality: "... Côte de Coromandel, ..." [= India: Coromandel coast].
= "[*Phalaena*] *Eugenia*." - Stoll in Cramer 1782: 235, pl. 398, fig. M. Type locality: "... de l'Isle Molucque d'Amboine" [= Indonesia: Maluku, Ambon Island].
= "*Neochera stibostethia*, n. sp." - Butler 1875: 329. Type locality: "Bourou ..." [= Indonesia: Maluku, Buru Island].
= "*Aganais Eugenia* Gram. Var. *Herpa* Walker ..." - Snellen 1879: 78. Type locality: "Bonthain" [= Indonesia: South Sulawesi, Bantaeng].
= "*Hyps*.[*a*] *basilissa*, n. sp." - Meyrick 1886: 767. Type locality: "Cooktown and Cairns, Queensland; ..." [= Australia: Queensland, Cooktown].
= "*Neochera eugenia javana* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 198. Type locality: "Java" [= Indonesia: Java].
= "*Neochera eugenia fumosa* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 198. Type locality: "Sambawa (type; ...); Pulu Laut. ...; Pura ... ." [= Indonesia: West Nusa Tenggara, Sumbawa Island].
= "*Neochera eugenia proxima* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 199. Type locality: "Timor (...type; Oinainisa ...); Alor ...; Adonara ...; Kalao ...; Port Darwin, N.W. Australia ..." [= East Timor].
= "*Neochera eugenia affinis* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 200. Type locality: "Halmahera (type;...); Ternate ...; Batjan ...; Morotai ..." [= Indonesia: North Maluku, Halmahera].
= "*Neochera eugenia papuana* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 200. Type locality: "Dutch and German N. Guinea (type from Humboldt Bay); Waigen [= Waigeo]; Aru; Mysol; and probably all the islands near the western peninsula of N. Guinea." [= Indonesia: Papua: Yos Sudarso Bay].
= "*Neochera eugenia fuscipennis* Rothsch. subsp. nov." - Rothschild in Rothschild, Jordan 1896: 201. Type locality: "New Britain ..." [= Papua New Guinea: New Britain Island].
= "*Neochera* Hbn. *contraria* spec. nov." - Reich 1936: 419. Type locality: "Neu-Hebriden" [= Republic of Vanuatu].

Material examined: 3♂ & 1♀ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ & 1♀, same locality, 25.I-02.II.2009; 1♀ (Plate 6 figs 3-4), same locality an date; 1♂, same locality, 30.I.2009; 2♂, Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05-16.I.2009.
Note: Based on the coloration of the wings, this is a well-defined species among Aganaidae. Currently, there are about two dozen subspecies that often live sympatrically, this actually meaning that all of them are in need of a serious revision. In New Guinea, the subspecies *papuana* Rothschild, 1896 is known to occur.
Distribution: *N. dominia* is the most widespread species of the genus, being known almost everywhere in the Oriental and Australian regions.

Genus **Asota Hübner, 1819 ["1816"]**
"*Asota* ..." - Hübner 1819 ["1816"]: 164. Type species: *Phalaena javana* Cramer, 1780, by subsequent designation by Jordan in Rothschild, Jordan (1896: 203).

= "*Hypsa* ..." - Hübner 1819 ["1816"]: 172. Type species: *Phalaena silvandra* Stoll, 1781 [= *Phalaena heliconia* Linnaeus, 1758], by subsequent designation by Kirby (1892: 388).
= "*Psephea* Eg." - Billberg 1820: 86. Type species: *Noctua caricae* Fabricius, 1775, by original designation.
= "Genre *Aganais*. Boisd." - Boisduval 1832: 248. Type species: *Noctua caricae* Fabricius, 1775, by subsequent designation by Kirby (1892: 385 [2]).

Note: This is the largest genus in the family. It contains slightly more than 50 species. Unfortunately, many of the species-level taxa described in this genus are in need of revision.
Distribution: The Afrotropical, Oriental and Australian regions from Sierra Leone and Togo in the west and from Hubei Province, central China in the north to the southeastern part of Queensland, Australia in the south and the Solomon Islands in the East.

***Asota australis* (Boisduval, 1832)** (Plate figs 5-6)
"*Aganais australis*. Boisd." - Boisduval 1832: 252, pl. 5, fig. 3. Type locality: "Nouvelle-Guinée" [= New Guinea].
= "*Hypsa aequalis*." - Walker 1864: 214. Type locality: "Aru" [= Indonesia, Moluccas, Aru islands].
= "*A*.[*sota*] *australis sinuosa* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 329. Type locality: "Amboina ... Buru, ..." [= Indonesia, Moluccas, Ambon Id., Buru Island].
= "*A*.[*sota*] *australis septentrionalis* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 330. Type locality: "Halmahera ..., ... Batjan ..." [= Indonesia, Moluccas, Bacan Island].
= "*A*.[*sota*] *australis lineata* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 330. Type locality: "Kei Tocal ..." [= Indonesia, Moluccas, Kei Islands].
= "*A*.[*sota*] *australis assimilis* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 330. Type locality: "Port Darwin, N.W. Australia, ...".

Material examined: 1♂ (Plate 6 figs 5-6), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I-02.II. 2009.
Note: Currently, this species has been divided on a few subspecies which, in our opinion, are in need of a serious revision. Very likely, they are only individual forms of one species.
Distribution: The species is known from New Guinea and neighbouring islands, as well as the northern and eastern parts of Australia.

Key to *Asota* Hübner, 1819 species of Papua Province, Indonesia by wing pattern

1 Hindwing entirely black with strong blue sheen ... *A. eusemioides* (Plate 6, figs 13–16)
– Hindwing yellow or white with or without dark pattern ... 2
2 Hindwing with yellow ground colour ... 3
– Hindwing with white ground colour ... 7
3 Hindwing with black spots ... *A. caricae* (Plate 7, figs 17–18)
– Hindwing without black spots ... 4
4 Forewing yellow with brown veins, without discal spot ... *A. vulvia*
– Forewing with contrast veins and with a yellow discal spot ... 5
5 Forewing with a small discal spot only ... *A. strigosa* (Plate 7, figs 25–26)
– Forewing with discal and antemedial spots ... 6
6 Forewing with pale yellow spots ... *A. australis* (Plate 6, figs 11–12)
– Forewing with yellow to yellow-orange spots, if spots pale yellow then hindwing completely yellow ... *A. orbona*
7 Forewing with a large white spot medially; hindwing white anally ... *A. plana* (Plate 7, figs 23–24)
– Forewing with a clavate white spot on Cu-stem and discal vein; hindwing black anally ... *A. heliconia* (Plate 7, figs 19–22)

***Asota caricae* (Fabricius, 1775)** (Plate 7 figs 1-2)
"*Noctua Caricae*." - Fabricius 1775: 596 [3]. Type locality: "... Indiae orientalis" [= Eastern India].
= "[*Phalaena*] *Alciphron*." - Cramer 1775: 58,

2 – Previous indications that the type species of the genus had been fixed by monotypy (Watson et al. 1980) are incorrect, because the original description of *Aganais* had included six species. Besides this, the proposal of *Aganais borbonica* Boisduval, 1833 as the type species by Snellen (1888) is invalid, because originally Boisduval had not included this species in the genus.

3 – The priority of the papers on Lepidoptera published in 1775 has been fixed under the Plenary Powers of the International Commission on Zoological Nomenclature (ICZN 1958).

pl. 133, fig. E [4]. Type locality: "... de la Côte de Coromandel à Tranquebar" [= India: Tamil Nadu, Tharangambadi].
= "*A.*[*sota*] *caricae euroa* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 316. Type locality: "Solomon Islands: Alu ..." [= Solomon Islands: Shortland Island].
= "*Asota anawa*, nov." - Swinhoe 1903: 66. Type locality: "Bukit Besar, Nawngchik; Biserat, Jalor." [= southern Thailand: Pattani and Yala provinces].

Material examined: 1♂ (Plate 7 figs 1-2), Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008.
Note: This is the most common and, based on hindwing coloration, the most easily recognizable species of *Asota*. We believe that all of its described subspecies are simply its individual forms.
Distribution: This species is widespread nearly across the entire Austro-Oriental Region from the state of Sikkim in India to the Solomon Islands. It is also known in Queensland, Australia.

Asota eusemioides **(Felder, 1875)** (Plate 6 figs 7-10)
"*Aganais eusemioides* F." - Felder R. in Felder C., Felder R. & Rogenhofer 1875: [1], Tab. 106, Fig. 1. Type locality: "Nov. Guinea" (explanations to the plates) [= New Guinea].
= "*A.*[*sota*] *versicolor subrupta* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 337. Type locality: "Duke of York I." [= Papua New Guinea: East New Britain Province, Duke of York Island].
= "*Asota albiluna* Rothsch., sp. nov." - Rothschild in Rothschild, Jordan 1899: 433. Type locality: "Milne Bay, Dutch N. Guinea, ..." [= Papua New Guinea: Milne Bay].
= "[*Asota versicolor*] Form ... *novohibernica* ..." - Pagenstecher 1900: 48. Type locality: "... von Neu-Mecklenburg" [= Papua New Guinea: New Ireland Province, New Ireland Island].

Material examined: 1♂ (Plate 6 figs 7-8), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.I.2009; 1 ♂, same locality and date; 1♂, same locality, 31.I.2009; 1♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I-02.II. 2009; 1♀ (Plate 6 figs 9-10), same locality and date.
Note: Due to the dark coloration of the hindwing, this species cannot be confused with any other aganaid of New Guinea.

4 – Pages 1-132 and plates 1-84 of Cramer's work were published in 1775 (Fletcher, Nye 1982).

Distribution: This species is known from Sulawesi and New Guinea with surrounding islands.

Asota heliconia **(Linnaeus, 1758)** (Plate 7 figs 3-6)
"*Phalaena*. ...*heliconia*." - Linnaeus 1758: 511. Type locality: "... in Calidis regionibus." [= Indonesia: Maluku, Ambon Island].
= "[*Noctua*] *Dama*." - Fabricius 1775: 596. Type locality: "... in nova Hollandia" [= Australia].
= "*A.*[*ganais*] *Doryca*. Boisd." - Boisduval 1832: 251. Type locality: "... à la Nouvelle-Guinée" [= New Guinea].
= "*Hypsa intacta*." - Walker 1854: 451. Type locality: "Java" [= Indonesia: Java].
= "*Hypsa leuconeura*, n. sp." - Butler 1879: 161. Type locality: "... New Ireland ..." [= Papua New Guinea: New Ireland Province, New Ireland Island].
= "*Hypsa semifusca*, sp. n." - Butler 1887a: 220. Type locality: "Alu ..." [= Solomon Islands: Western Province, Shortland Island].
= "*Hypsa malisa*. n. sp." - Swinhoe 1892: 87. Type locality: "North Halmaheira ..." [= Indonesia: North Maluku, Halmahera Island].
= "*Hypsa ghara*. n. sp." - Swinhoe 1892: 89, pl. 3, fig. 1. Type locality: "Ké Island" [= Indonesia: Maluku, Kei Islands].
= "*A.*[*sota*] *heliconia enganensis* subsp. nov." -Rothschild in Rothschild, Jordan 1897: 345. Type locality: "Engano Island, ..." [= Indonesia: Bengkulu, Enggano Island].
= "*A.*[*sota*] *heliconia timorana* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 349. Type locality: "Timor: Dili, Portuguese Timor ..., Oinainisa, Dutch Timor ..." [= Indonesia / East Timor: Timor Island].
= "*A.*[*sota*] *heliconia kalaonica* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 349. Type locality: "Kalao Island, south of Celebes ..." [= Indonesia: Sulawesi Tenggara, Pulau Kalao].
= "*A.*[*sota*] *heliconia sangirensis* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 351. Type locality: "Sangir Is. ..." [= Indonesia: North Sulawesi, Sangir Island].
= "*A.*[*sota*] *heliconia bandana* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 354. Type locality: "Banda Islands ..." [= Indonesia: Maluku, Banda Islands].
= "*A.*[*sota*] *heliconia kiriwinae* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 356. Type locality: "Kiriwina, Trobriand Islands ..." [= Papua New Guinea: Milne Bay Province, Kiriwina Island].
= "*Aganais* (*Asota*) *unicolor* n. sp." - Hagen 1902: 338. Type locality: "... den Mentawej-Inseln." [= Indonesia: West Sumatra, Mentawai Islands].

= "*Asota latiradia*, nov." - Swinhoe 1905: 618. Type locality: "Babber Island, west of Timor-Laut; ..." [= Indonesia: Maluku, Barbar Island].
= "*Asota heliconia toekangbesiensis* nov. subsp." - Jurriaanse, Lindemans 1920: 34, pl. 5, figs 531, 532. Type locality: "... van den Toekang Besie Arch." [= Indonesia: Southeast Sulawesi, Tukangbesi Islands].
= "*A*.[*sota*] *heliconia atrata* subsp. nov." - Jordan 1924: xxxv. Type locality: "St. Mathias and Squally ..." [= Papua New Guinea: Bismarck Archipelago, St. Mathias Island].

Material examined: 1♂ Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 1♀ (Plate 7 figs 5-6), same locality, 28.XII.2008; 1♂, same locality, 03.II.2009; 1♀ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂ (Plate 7 figs 3-4), same locality, 25-26.I.2009; 1♀, same locality and date; 4♂, same locality, 25.I-02.II.2009; 1♂, same locality, 27.I.2009; 5♂ & 1♀, same locality, 30.I.2009; 1♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05-16.I.2009.
Note: In the original description, Linnaeus (1758) noted this species as living "in Calidis regionibus", or warm regions. Somewhat later, he wrote that "*Phalaena Noctua heliconia*" "Habitat in Indiis" (Linnaeus 1764: 385). In his work, Seitz (1914: 231) wrote, "As the typical *heliconia* L. ... I consider the form occurring in the Moluccas, Solomon Islands and the Bismarck Archipelago, where Linné found a specimen from Amboina". Following Seitz, the island of Ambon must be considered as the type locality of this species. Seitz also stated, "Of this very common butterfly distributed over a great part of the Indian region more than 30 forms have been described" (l.c.: 231). Now we can add that most of them are simply individual forms without any status in nomenclature.
Distribution: "One of the most widely distributed and very common species ..., which ranges from India to the Solomons..." (Jordan 1924: xxxiv).

***Asota plana* (Walker, 1854)** (Plate 7 figs 7-8)
"*Hypsa plana*." - Walker 1854: 450. Type locality: "Java. ... Ceylon. ... Silhet." [= Indonesia: Java [5]].
= "*Hypsa complana*." – Walker 1864: 213. Type locality: "Timor" [= Indonesia / East Timor: Timor Island].
= "*Aganais albifera* F." - Felder R. in Felder C., Felder R. & Rogenhofer 1875: [1], Tab. 106, Fig. 3. Type locality: "Celebes, Java, Borneo ..." [= Borneo [6]].
= "*A*.[*sota*] *plana transiens* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 359. Type locality: "Endano ..." [= Indonesia: Bengkulu, Enggano Island].
"*A*.[*sota*] *plana centralis* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 360. Type locality: "S. Celebes: Lompa Battan, ... Macassar, ... Bantimoerong, ..." [= Indonesia: South Sulawesi, environs of Makassar].
= "*A*.[*sota*] *plana cincta* subsp. nov." - Rothschild *in* Rothschild, Jordan 1897: 361. Type locality: "Buru ..." [= Indonesia: Maluku, Buru Island].
= "*A*.[*sota*] *plana commixta* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 361. Type locality: "Dutch N. Guinea: Humboldt Bay ..., Etna Bay ..." [= Indonesia: Papua: Yos Sudarso Bay].
= "*A*.[*sota*] *plana fergussonis* subsp. nov." - Rothschild in Rothschild, Jordan 1897: 362. Type locality: "Fergusson I., D'Entrecasteaux Is. ..." [= Papua New Guinea: D'Entrecasteaux Islands, Fergusson Island].

Material examined: 1♀ (Plate 7 figs 7-8), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I-02.II.2009.
Note: Based on the broadly white forewing, this species is clearly distinguished from all other *Asota* in New Guinea. Like in the previous one, numerous species-group taxa have also been described within this species. In general, their taxonomic status remains unclear, but it is assumed that the subspecies *commixta* Rothschild, 1897 inhabits New Guinea.
Distribution: This species is widely distributed in the Oriental Region and New Guinea with the adjacent islands.

***Asota strigosa* (Boisduval, 1832)** (Plate 7 figs 9-10)
"[*Aganais*] *Strigosa*. Boisd." - Boisduval 1832: 250. Type locality. "... à la Nouvelle-Guinée." [= New Guinea].

Material examined: 1♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 7 figs 9-10), same locality, 31.XII.2008; 1♂, same locality and

5 – Since no lectotype of the nominotypical subspecies has been selected and fixed yet, we follow the opinion of K. Jordan (Rothschild, Jordan 1897: 360) and regard the island of Java as the type locality of the species.

6 – This locality was referred to as type by K. Jordan (Rothschild, Jordan 1897: 359), even though no lectotype of this taxon has been selected yet.

date; 1♂, same locality, 25.I-02.II.2009.
Note: This species somewhat resembles *A. caricae* (F.), but clearly differs by the coloration of the hindwing which is unspotted.
Distribution: The species is restricted to New Guinea and some adjacent islands.

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To the knowledge of Macroheterocera of Southeast Asia and New Guinea. II. Hawk moths (Lepidoptera: Sphingidae) of Papua Province, Indonesia

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Abstract: A collection of the Hawk moths family Sphingidae containing 33 species of 15 genera from the Indonesian part of the island of New Guinea is listed and figured. Bibliography of this group is discussed. Synonymy is given.

Key words: Lepidoptera, Sphingidae, Indonesia, Papua Province, New Guinea.

Introduction

This publication is the second in a series[1] dedicated to Macroheterocera of Southeast Asia and New Guinea. It deals with a collection of Hawk moths (Lepidoptera: Sphingidae) taken during a two-month long expedition to New Guinea by the second author together with V.V. Sinyaev ("Eco-Design Studio, Moscow, Russia). The places and dates of collection are described in detail and illustrated in our first publication of this book (page 157, plate 5 figs 1-6).

It is obvious that the Hawk moths should be considered one of the best-studied groups of Macroheterocera in both the Oriental and Australian regions. There are many publications dealing with this interesting group. Unfortunately, most of them are descriptions of new species or subspecies and only a few of them concerns reviews or revisions of certain groups of species or genera. Some such works are cited in the bibliography in the end of this paper.

We should not forget about the existence of sites on the Internet, that introduce us to this interesting group of Lepidoptera. The more complete and professional of such sites should be noted. We consider the sites of Beck and Kitching (2008), Kitching and co-authors (Kitching et al. 2013) and Hogenes (2013) to be in this category. But you should always keep in mind that any Internet site is not a publication, and data from the site should be used very carefully. We used data from these sites to ascertain species distribution.

As in our previous publication (Gorbunov, Zamesov 2014), we have restricted the synonymy lists mainly to the taxa described from New Guinea and neighbouring archipelagos. In addition, we have excluded all homonyms and infrasubspecific names. All synonyms in the text are given in quotation marks because they have been checked in original publications.

The result of processing the collected material was the discovery of 34 species representing 15 genera which is 42.5% and 78.95% of Hawk moths fauna of the Indonesian Papua, respectively. All of them have been collected in new localities, thus providing new faunistic records. All taxa mentioned and illustrated herein are housed in the collection of the second author.

The order of all taxa in the list is given with accordance of our conception of the phylogenetic relationships within the family.

List of the Sphingidae (Lepidoptera) of Papua Province, Indonesia

Acherontia [Laspeyres], 1809

"... *Acherontia* ..." - [Laspeyres] 1809: 100. Type species: *Sphinx atropos* Linnaeus, 1758, by original designation.

1 – The first publication in the series concerns the Aganaidae (Lepidoptera: Noctuoidea) of Papua Province, Indonesia. It is published in the present volume on pp 157-165, pls 5-7.

= "*Brachyglossa*. Mihi." - Boisduval 1828: 33. Type species: *Sphinx atropos* Linnaeus, 1758, by monotypy.
= "*Atropos* Oken" - Agassiz 1846: 9. Type species: *Sphinx atropos* Linnaeus, 1758, by monotypy (Oken 1815).

Note: Superficially, this genus is distinguished very easily from other Hawk moths. It contains only three species. The list of the species of the genus was published by Eitschberger (2003a). All species are known as active migrants and therefore the presence of subspecies is highly questionable for the species of the genus. Only a single species occurs in New Guinea. It is represented in our material.
Distribution: The Afrotropical, Oriental and Australian regions.

***Acherontia lachesis* (Fabricius, 1798)** (Plate 8 figs 1-2)
"*Sphinx*. ... *Lachesis*." - Fabricius 1798: 434. Type locality: "... in India orientali ..." [= East India].
= "*Acherontia Satanas*, sp. n." - Boisduval 1836: 5, pl. 16, fig. 1. Type locality: "Indes orientales." [= East India].
= "*Sphinx* (*Acheronthia*) *lethe*, Westw." - Westwood 1848; 87, pl. 42, fig. 2. Type locality: "... various parts of the East Indies, Ceylon, & c." [= East India, Sri Lanka].
= "*Acherontia Sojejimae* Mats." - Matsumura 1908: 27, pl. 4, fig. 4. Type locality: "Locality-Kyushu (Saga)" [= Japan: Kyushu, Saga Prefecture].

Material examined: 1♂ (Plate 8 figs 1-2) Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I-02.II.2009.
Note: This species can easily be distinguished from the other Hawk moths of New Guinea by the figure of a "dead head" on the mesothorax dorsally and an interrupted medial light blue stripe on the abdomen. Presently it is divided into two subspecies, but we do not welcome the separation of populations of the Philippines as a separate subspecies *A. lachesis diehli* Eitschberger, 2003.
Distribution: This species is widespread nearly across the entire Austro-Oriental Region from Pakistan to the New Guinea Island. It is also known in eastern part of the Palaearctic Region.

***Agrius* Hübner, 1819 ["1816"]**
"*Agrius* ..." - Hübner 1819 ["1816"]: 140. Type species: *Sphinx cingulata* Fabricius, 1775, by subsequent designation by Tutt (1902: 355).
= "*Timoria*, gen. nov." - Kaye 1919: 93. Type species: *Timoria concolorata* Kaye, 1919, by original designation.

Note: This small genus consists of six species only. Some of them are known as active migrants. Two species are known in New Guinea. Both of them are present in our material from New Guinea.
Distribution: This genus is ubiquitous, occurring throughout the world.

***Agrius convolvuli* (Linnaeus, 1758)** (Plate 8 figs 3-6)
"*Sphinx*. *Convolvuli*." - Linnaeus 1758: 490. Type locality: not stated. [Europe?].
= "[*Sphinx*] *Patatas* ..." - Ménétriés 1857: 90. Type locality: "Taïti." [= French Polynesia, Tahiti Island].
= "*Sphinx Convolvuli* (var. *S. distans*)." - Butler 1874: 30, pl. 9, fig. 11. Type locality: "New Zealand ...".
= "*Protoparce orientalis*, n. sp." - Butler 1876: 609, pl. 41, figs 16, 17. Type locality: "North India ...; Scinde? ...; North Bengal ...; Moulmein ...; Ceylon ...; Hong-Kong ...; Java ...; Hakodadi ..." [= North and North East India; Sri Lanka; Hong Kong; Java; Japan: Hokkaido, Hakodate].
= "[*Agrius convolvuli*, Linné.] var. *javanensis*, n. var." - Tutt 1904: 333. Type locality: not stated [= Indonesia: Java?].
= "[*Agrius convolvuli*, Linné.] var. *ichangensis*, n. var." - Tutt 1904: 333. Type locality: "... from Ichang, ..." [= China: Hubei Province, Yichang].
= "[*Agrius convolvuli*, Linné.] var. *tahitiensis*, n. var." - Tutt 1904: 333. Type locality: "The Tahitian race ..." [= French Polynesia: Tahiti Island].
= "*Protoparce convolvuli* var. *indica* ..." - Skell 1913: 56. Type locality: "Petoemboekan, Sumatras Ostküste, ..." [= Indonesia: Sumatra, Petoemboekan].
= "*Herse convolvuli marschallensis* subsp.nov." - Clark 1922: 3. Type locality: "Taluit, Marschall Islands." [=Marschall Islands: Jaluit Atoll].

Material examined: 1♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008-02.I.2009; 1♀ (Plate 8 figs 5-6), same locality and date; 1♂ (Plate 8 figs 3-4), Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05-16.I.2009.
Note: It can be easy distinguished from the New Guinean congener by the pink pattern on the abdomen. This species has a very high migratory ability.
Distribution: It is distributed throughout the Old World. Nearly everywhere, it is very common.

***Agrius luctifera* (Walker, 1864)** (Plate 8 figs 7-8)
"*Macrosila luctifera*." - Walker 1864: 35. Type locality: "New Guinea, Mysol, Ceram." [= Indonesia: Maluku Islands, Seram Island; New Guinea Island].
= "*Protoparce Schmeltzii*, sp. n." - Butler 1882: 158. Type locality: "Australian region." [= Australia?].
= "*Phlegethontius lixi* sp. nov." - Rothschild 1894: 94. Type locality: "Nicura, British New Guinea ..." [= Papua New Guinea].
= "*P.*[*rotoparce*] *triangulifera*, sp. nov." — Holland 1900: 556. Type locality: "[Buru]" [= Indonesia: Maluku Islands, Buru Island].
= "*Timoria concolorata*, sp. n." - Kaye 1919: 93. Type locality: "Tenimber Island ..." [= Indonesia: Maluku Islands, Tanimbar Islands].
= "*Herse luctifera elegans*, subsp. nova." - Gehlen 1932: 65, Fig. 2. Type Locality: "Halmaheira." [= Indonesia: Maluku Islands, Halmahera Island].

Material examined: 1♀ (Plate 8 figs 7-8), Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008.
Note: This species differs from the previous one because of the presence of a white discal spot on the forewing and absence of pink scales on the abdomen.
Distribution: Restricted to Wallacea, New Guinea and the islands off to the NE and E of the latter.

***Megacorma* Rothschild, Jordan, 1903**
"*Megacorma* gen. nov." - Rothschild, Jordan 1903: 6 (key), 15. Type species: *Macrosila obliqua* Walker, 1856, by original designation.

Note: A small genus consisting of 4-5 species. However, due to the fact that several slightly different species were described inside the area of the widespread type species (Eitschberger 1999, 2003b, 2007), we believe that this genus is in need of a thorough revision. Superficially, species of the genus are large and robust with a very long proboscis and with a yellowish-grey forewing with a dark grey and black pattern. They somewhat resemble the species of the genera *Meganoton* Boisduval, 1875 ["1874"] and *Psilogramma* Rothschild, Jordan, 1903. A single species is known in New Guinea.
Distribution: The Oriental and Australian regions from India in the northwest to northeastern Australia and Solomon Islands in the south and southeast.

***Megacorma obliqua* (Walker, 1856)** (Plate 8 figs 9-10)
"*Macrosila obliqua*." - Walker 1856: 208. Type locality: "Ceylon." [= Sri Lanka].
= "S.[*phinx*] *Nestor*. Boisd." - Boisduval 1875 ["1874"] [2]: 113. Type locality: "... de l'Himalaya." [= Himalaya Mts.].
= "*Megacorma obliqua remota* subsp. nov." - Jordan 1924: 298. Type locality: "Arawa, Bouganville, ..." [= Papua New Guinea: Autonomus Region of Bougainville, Arawa Island].

Material examined: 1♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05-16.I.2009; 3♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I-02.II.2009; 1♂ (Plate 8 figs 9-10) same locality and date.
Note: A large and superficially easy to recognize species, which cannot be confused with any Hawk moth species of New Guinea. Usually it does not divided into subspecies.
Distribution: The Oriental and Australian regions from India in the northwest to northeastern Australia and Solomon Islands in the south and southeast.

***Meganoton* Boisduval, 1875 ["1874"]**
"*Meganoton*. Boisd." - Boisduval 1875 ["1874"]: 58. Type species: *Macrosila nyctiphanes* Walker, 1856, by subsequent designation by Kirby (1892: 682).

Note: A small genus consisting of five or six species. Superficially, the species of the genus are somewhat similar to those of *Megacorma* Rothschild, Jordan, 1903 and *Psilogramma* Rothschild, Jordan, 1903. Only two species are known to occur in New Guinea. We have on hand only a pair of a single species from New Guinea.
Range: The genus occurs in the eastern Palaearctic, in the Oriental and the northern part of the Australian regions.

***Meganoton rubescens* (Butler, 1875)** (Plate 8 figs 11-14)
"*Diludia rubescens*." - Butler 1875c [3]: 623. This is the new name for *Diludia rufescens* Butler, 1875b[4]: 260 [nec *Diludia rufescens* Butler, 1875a [5]: 12)].

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2 – Butler (1876: 513) wrote: "Dr. Boisduval's long expected work on the Sphingidae has recently appeared, bearing date 1874; that it was not, however, procurable earlier than February 22nd, 1875, I have evidence in a letter from the author, dated 18th of February, 1875, ...".
3 – This paper was published in "Proceedings ..." 16th of November 1875, what is shown in the top of pages.
4 – This paper was published in "Proceedings ..." 16th of March 1875, what is shown in the top of pages.
5 – This paper was published in "Proceedings ..." 5th of January 1875, what is shown in the top of pages.

Type locality: "North India".
= "*M.*[*acrosila*] *Severina*, n. sp." - Miskin 1891: 25. Type locality: "… Cape York." [= Australia: Queensland, Cape York Peninsula].
= "*Meganoton thielei* nov. spec." - Huwe 1906: 316, Taf. 6, Fig. 1. Type locality: "… Sumatra …" [= Indonesia: Sumatra].
= "*Meganoton rufescens* [sic!] *joachimi* subsp. nov." - Clarck 1926: 45. Type locality: "Ceram." [= Indonesia: Seram Island].
= "*Maganoton rufescens* [sic!] *titan*, subsp. nova." - Gehlen 1933: 78. Type locality: "Von Halmaheira" [= Indonesia: Maluku, Halmahera Island].
= "*Meganoton rufescens* [sic!] *amboinicus* subsp. nov." - Clark 1938: 38. Type locality: "… on Amboina, Moluccas." [= Indonesia: Maluku, Ambon Island].

Material examined: 1♂ (Plate 8 figs 11-12) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♀ (Plate 8 figs 13-14) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009.
Note: The species is somewhat variable in wing colour patterns as well as background coloration. Presently it is divided into six subspecies, of which subspecies *severina* Miskin, 1891 inhabits New Guinea and northeastern Australia.
Distribution: It is widespread from north India and south China in the northwest and north to north and northeastern Australia and Solomon Islands in the south and southeast.

Psilogramma **Rothschild, Jordan, 1903**
"*Psilogramma* gen. nov." - Rothschild, Jordan 1903: 29 (key), 42. Type species: *Sphinx menephron* Cramer, 1780, by original designation.

Note: Superficially the extremely variable species of the genus resembles those of the genera *Meganoton* Boisduval, 1875 ["1874"], *Megacorma* Rothschild, Jordan, 1903, and somewhat *Agrius* Hübner, 1819 ["1816"]. Until the beginning of this century, this genus included only four species (Holloway 1987; Meng 1990). Thanks to the diligence of some researchers (Brechlin 2001; Eitschberger 2001; 2010a) during the first decade the number of species in the genus has been brought up to more than 60 (Eitschberger 2010b). We completely agree with the opinion of Zolotuhin and Ryabov that "the system and score of the genus became very complicate after the last works …" (Zolotuhin, Ryabov 2012: 37). Besides that we have to add that now this genus is in need of revision using not only morphological but also molecular data. At present three species are known to occur in New Guinea. All of them are present in our collection.
Distribution: This genus inhabits the southern and eastern parts of Palaearctic, Oriental and Australian regions.

Psilogramma mastrigti **Eitschberger, 2001** (Plate 9 figs 1-6)
"*Psilogramma mastrigti* spec. nov." - Eitschberger 2001a (14th of May): 7, Abb. 15; Taf. 22, Abb. 1-6; Taf. 23, Abb. 1-4. Type locality: "Indonesia, Irian Jaya, Kabupaten Jayapura, Kecamatan Lehre, Rifi Taja, 2000 m, …" [= Indonesia: Papua Province, Jayapura area].
= "*Psilogramma papuensis* Brechlin n. sp." - Brechlin 2001 ([31th] of May): 16, Abb. 19, 20, 42, 43, 84, 85. Type locality: "Papua New Guinea, Western Highlands - province, Kubang near Kol, 1800 m, …" [= Papua New Guinea: West Highlands Province, environs of Mount Hagen].
= "*Psilogramma mastrigti aruensis* subsp. nov" - Eitschberger 2004: 5, Farbtaf. 2, Abb. 4, 5; Farbtaf. 3, Abb. 1, 2. Type locality: "Indonesia, Aru Archipelago, 7 m, Island of Wokam, Province Maluku, Kabupatan Maluku, …" [= Indonesia: Maluku Islands, Aru Islands, Tanahbesar Island].

Material examined: 1♂ (Plate 9 figs 3-4) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 4♂, 2♀, same locality and date; 5♂, same locality, 27-30.I.2009; 10♂, 1♀ (Plate 9 figs 5-6), same locality, 25.I-02.II.2009; 3♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♂ (Plate 9 figs 1-2), same locality and date; 1♂ Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 04-06.II.2009.
Note: The status of this species, as well as all newly described ones are in need a careful revision. At present this species is divided into two subspecies, of which the nominotypical one occurs in New Guinea.
Distribution: Restricted to the eastern Maluku, New Guinea and north and eastern Australia.

Psilogramma wernerwolfi **Eitschberger, 2001** (Plate 9 figs 7-10)
"*Psilogramma wernerwolfi* spec. nov." - Eitschberger 2001a (14th of May): 8, Abb. 17, Taf. 27, Abb. 1-6, Taf. 28, Abb. 1-4. Type locality: "Indonesia, Irian Jaya, Sentani, 60 m, …" [= Indonesia: Papua Province, Sentani].
= "*Psilogramma kitchingi* Brechlin & Lachlan "n.

sp." - Brechlin, Lachlan in Brechlin 2001 ([31th] of May): 18, Abb. 18, 27, 44, 66, 67. Type locality: "Indonesia, Irian Jaya, Nabire, 25 km S Manokwari, Arfak Mts., Ngat Biep, river Ngat valley, 250 m. ..." [= Indonesia: West Papua, environs of Manokwari].

Material examined: 2♂, 1♀ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 9 figs 7-8), 1♀ (Plate 9 figs 9-10), same locality, 25.I-02.II.2009; 1♂, same locality and date.
Note: Superficially, this species is somewhat lighter in coloration and smaller than previous one.
Distribution: The species seems to be endemic to New Guinea.

Psilogramma anne **Eitschberger, 2001** (Plate 9 figs 11-18)
"*Psilogramma anne* spec. nov." - Eitschberger 2001a: 10, Abb. 25; Taf. 41, Abb. 1-4; Taf. 42, Abb. 1, 2. Type locality: "Indonesia, Irian Jaya, Sentani, 60 m, ..." [= Indonesia: Papua Province, Sentani].

Material examined: 1♂ (Plate 9 figs 13-14), 1♀ (Plate 9 figs 17-18) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 9♂, same locality and date; 2♂, 1♀ (Plate 9 figs 15-16), same locality, 25.I-02.II.2009; 1♂, same locality, 27-30.I.2009; 1♂ (Plate 9 figs 11-12) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 5 ♂, same locality and date.
Note: This is the darkest species of the genus in the fauna of New Guinea.
Distribution: As the previous one, it is known to occur in New Guinea only.

Ambulyx **Westwood, 1848**
"*Sphinx* (*Ambulyx*) ..." - Westwood 1848 [6]: [61]. Type species: *Sphinx* (*Ambulyx*) *substrigilis* Westwood, 1848, by monotypy.
= "*Oxyambulyx* gen. nov." - Rothschild, Jordan 1903: 173 (key), 192. Type species: *Sphinx substrigilis* Westwood, 1848, by original designation.
Note: This is a large genus which contains up to 60 described species with a lot of subspecies. This genus cannot by confused with any other Hawk moths of New Guinea because of the shape and colour pattern of the forewing. At present, four species only have been collected in New Guinea. We have on hand only three species from the island.
Distribution: This genus is distributed in the eastern part of the Palaearctic, Oriental and Australian regions from Pakistan and North India in the west to The Solomon Islands in the east, from Korea and Japan in the north and northern Australia in the south.

Ambulyx wildei **Miskin, 1891** (Plate 10 figs 1-6)
"*A.*[*mbulyx*] *Wildei*, n. sp." - Miskin 1891: 20. Type locality: "Cairns." [= Australia: Queensland, Cairns].

Material examined: 1♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂, same locality, 25.I.2009; 1♂ (Plate 10 figs 1-2), same locality, 25.I-02.II.2009; 1♂ (Plate 10 figs 3-4), 1♂ (Plate 10 figs 5-6) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 2♂, same locality and date.
Note: This species is somewhat similar to *A. phalaris* Jordan, 1919 and *A. dohertyi* Rothschild, 1894, but can be distinguished from them by the more contrast coloration of the wings.
Distribution: It inhabits New Guinea and coastal areas of Queensland in Australia.

Ambulyx phalaris **(Jordan, 1919)** (Plate 10 figs 7-8)
"*Oxyambulyx phalaris* Jord." - Jordan 1919: 190. Type locality: "Dutch and British New Guinea, ..." [= Papua New Guinea].
= "*O.*[*xyambulyx*] *phalaris carycina* subsp. nov." - Jordan 1919: 191, Type locality: "Rook Island, ..." [= Papua New Guinea: Umboi Island].

Material examined: 1♀ (Plate 10 figs 7-8) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: It is a rather rare species in collections. Presently it is known from a few localities.
Distribution: This species inhabits the island of Seram in the eastern Maluku and the island of New Guinea.

Ambulyx dohertyi **Rothschild, 1894** (Plate 10 figs 9-12)
"*Ambulyx dohertyi* sp. nov." - Rothschild 1894: 87. Type locality: "Humboldt Bay, N. New Guinea ..." [= Indonesia: Papua Province, Yos Sudorso Bay].
= "*Oxyambulyx dohertyi salomonis* subsp. nov."

6 – We cannot agree with the opinion of Fletcher and Nye (1982) and some other lepidopterists (Brechlin 2009a, 2009b; Zolotuhin, Ryabov 2012) that the date of publication of this taxon should be "1847", which is indicated for the colour plate with the picture of the type species, since this plate does not have any name. The name "*Ambulyx*" is given in the text, for which the date "1848" is shown on the title-page of the work. Sherborne (1922) held the same opinion.

- Rothschild, Jordan 1903: 209. Type locality: "Guadalcanar [sic!], Solomon Is., ..." [= Solomon Islands: Guadalcanal Island].
= "*Oxyambulyx dohertyi queenslandi* subsp. nov." - Clark 1928: 40. Type locality: "Kuranda, Queensland, Australia." [= Australia: Queensland.].
= "*Ambulyx dohertyi novoirlandensis* n. ssp." - Brechlin, Kitching 2010: 21. Type locality: "PNG, New Ireland prov.; Lelet plateau, 5 km SE Kamiraba; ..." [= Papua New Guinea: New Ireland Province, New Ireland Island].
= "*Ambulyx dohertyi novobritannica* n. ssp." - Brechlin, Kitching 2010: 22. Type locality: "PNG/ West New Britain prov.; Bereme, 57 km SE Kimbe, ..." [= Papua New Guinea: West Britain Province, New Britain Island].

Material examined: 1♂ (Plate 10 figs 9-10) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 10 figs 11-12), same locality, 25.I-02.II.2009; 2♂, same locality and date; 4♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: One of the most variable species of the genus in the region. At present, it is divided into five subspecies, which, in our opinion, is completely unjustified.
Distribution: It occurs in New Guinea and surrounding islands ranging from Raja Ampat Islands in the west to Solomon Islands in the east. It is know in northern Australia as well.

***Gnathothlibus* Wallengren, 1858**
"*Gnathothlibus*. Mihi." - Wallengren 1858: 137. Type species: *Gnathothlibus erotoides* Wallengren, 1858 [= *Sphinx eras* Boisduval, 1832], by original designation.
= "*Chromis* ..." - Hübner 1819 ["1816"]: 138 [nec *Chromis* Lacepède, 1802 (Pisces)]. Type species: *Sphinx erotus* Cramer, 1777, by monotypy.

Note: The species of the genus can be easy separated from other genera of the region by the colour pattern of the forewing and bright yellow or orange coloration of the hindwing. Currently, there is no consensus on the species structure of the genus. Its composition includes from 7 (Zolotuhin, Ryabov 2012) to 12 (Beck, Kitching 2008; Kitching et al. 2013) species.
Distribution: This genus is distributed in the Oriental and Australian regions from Sri Lanka in the west to East Polynesia in the east and southeast Australia in the south.

***Gnathothlibus eras* (Boisduval, 1832)** (Plate 10 figs 13-16)
"*D.*[*eilephila*] *eras*, Boisd." - Boisduval 1832: 185. Type locality: "... à Taïti." [= French Polynesia: Tahiti Island].
= "*Gnathothlibus erotoides* n. sp." - Wallengrén 1860: 43. Type locality: "Ad Sidney Novae Hollandiae ..." [= Australia].
= "*Chaerocampa* [sic!] ... *Sapor*" - Koch 1871: 239. Type locality: "dem Australischen ..." [= Australia].
= "*Chaerocampa* [sic!] ... *Eroides*" - Koch 1871: 240. Type locality: "vom Australischen ..." [= Australia].

Material examined: 1♂ (Plate 10 figs 13-14) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 10 figs 15-16) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: Some authors (Hogenes 2013) consider this taxon to be a subspecies of *G. erotus* (Cramer, 1777). In our opinion the population east of Sumatra and Borneo should be considered as a separate species.
Distribution: The species occurs the Philippines, Celebes and Java in the west to eastern Polynesia in the east and Southeast Australia in the South.

***Gnathothlibus heliodes* (Meyrick, 1889)** (Plate 10 figs 17-20)
"*Deilephila heliodes*, n. s." - Meyrick 1889: 455. Type locality: "... from New Guinea." [= New Guinea].
= "*Theretra alberti* sp. nov." - Rothschild 1895: 162, pl. 9, fig. 9. Type locality: "Fergusson Island, D'Entrecasteaux Islands ..." [= Papua New Guinea: Milne Bay Province, Fergusson Island].

Material examined: 1♂ (Plate 10 figs 17-18), 1♂ (Plate 10 figs 19-20) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♂, 1♀, same locality and date.
Note: This species is somewhat similar to an endemic *G. meeki* (Rothschild, Jordan, 1907), but it can be distinguished by the colour pattern of the hindwing.
Distribution: Restricted to New Guinea and some islands off to the northwest (Waigeo Island) and east (Fergusson Island).

***Daphnis* Hübner 1819 ["1816"]**
"*Daphnis* ..." Hübner 1819 ["1816"]: 134. Type species: *Sphinx nerii* Linnaeus, 1758, by subsequent designation by Curtis (1837: 626).
= "*Histriosphinx* Varis, gen. n." - Varis 1976: 127.

Type species: *Sphinx nerii* Linnaeus, 1758, by original designation.

Note: The species of the genus are large and robust. The ground colours of the wings are green, brown, dark green or dark olive with a characteristic wing pattern. At present the genus contains 12 species (Eitschberger, Melichar 2010; Haxaire, Melichar 2011). There are four species in New Guinea, of which we have three species in our collection.
Distribution: Afrotropical, Oriental and Australian regions. The type species of the genus is known as a vagrant to the eastern Palaearctic.

***Daphnis moorei* (W.J. MacLeay, 1866)** (Plate 11 figs 1-2)
"*Darapsa Moorei* nov. sp." - W.J. Macleay 1866: lv. Type locality: "[Cape York]" [= Australia: Queensland, Cape York Peninsula].
= "*Daphnis pallescens*, n. sp." - Butler 1875a: 6. Type locality: "Queensland." [= Australia: Queensland].
= "*Daphnis magnifica*, n. sp." - Butler 1877a: 461. Type locality: "Rockhampton, Queensland." [= Australia: Queensland, Rockhampton].
= "*Deilephila gigantea* spec. nov." - Röber 1921: 11. Type locality: "Südwest-Neuguinea; ..." [= Indonesia: West Papua].
Daphnis hypothous auctorum, nec *Daphnis hypothous* (Cramer, 1780) (Plate 11 figs 3-4).

Material examined: 1♂ (Plate 11 figs 1-2) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 3♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 5♂, same locality, 25.I-02.II.2009; 2♂, same locality, 27-30.I.2009; 5♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: This taxon was raised from a subspecies of *D. hypothous* (Cramer, 1780) (Plate 11 figs 1-2) to specific level by Eitschberger and Melichar (2010). Currently, it is not divided into subspecies. A rather common species.
Distribution: It occurs in New Guinea and surrounding islands off to the east up to Vanuatu, known from Queensland, Australia as well (Eitschberger, Melichar 2010).

***Daphnis dohertyi* Rothschild, 1897** (Plate 11 figs 5-8)
"*Daphnis dohertyi* sp. nov." - Rothschild 1897: 307. Type locality: "Kapaur, Dutch S. W. New Guinea, ..." [= Indonesia: West Papua, environs of Fakfak].
= "*Deilephila dohertyi callusia* subsp. nov." - Rothschild, Jordan 1916: 120. Type locality: "Solomon Islands: Choiseul (type) ..." [= Solomon Islands: Choiseul Island].

Material examined: 1♂ (Plate 11 figs 5-6), 1♂ (Plate 11 figs 7-8) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 4♂, 2♀, same locality and date; 1♂, same locality, 25.I-02.II.2009; 1♂, same locality, 31.I-02.II.2009; 1♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: Currently, it is divided into two subspecies, of which the nominotypical one inhabits the Island of New Guinea and the nearest islands to the northeast. A rather common species. It can be separated from all other congeners of New Guinea by the higher contrast wing pattern.
Distribution: It occurs in New Guinea and surrounding islands off to the east up to Solomon Islands.

***Daphnis protrudens* R. Felder, 1875** (Plate 11 figs 9-10)
"*D.*[*aphnis*] *protrudens* R. Felder." - R. Felder 1875[7]: 3, Tab. 76, Fig. 7. Type locality: "Molucc (Type) Lorquin." (Rothschild, 1919: 242) [= Indonesia: Maluku Islands].

Material examined: 1♂ (Plate 11 figs 9-10) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009.
Note: At present, this species is divided into two subspecies, of which the nominotypical one populates New Guinea.
Distribution: It occurs from the island of Sulawesi in the west to the Solomon Islands in the east. Beside that, it is known from Queensland, Australia as well.

***Acosmeryx* Boisduval, 1875 ["1874"]**
"*Acosmeryx*. Boisd." - Boisduval 1975 ["1874"]: 214. Type species: *Sphinx anceus* Stoll, 1781, by subsequent designation by Kirby (1892: 648).

Note: The species of the genus cannot be confused with any other genera of New Guinea because of the shape and coloration of the forewing, which is brown or grey-brown with a well-visible rose or violet sheen. "There is no unified point of view on

7 – The exact dates of the publication of the "Novara Reise" were published by Higgins (1963). According to this work, the date of publication of the fourth part ("Heft 4") of the Lepidoptera section is January 7th, 1875.

the amount of species, and the number of species included into it varies from 15 to 20" (Zolotuhin, Ryabov 2012: 108). Only two species of the genus are known to occur in New Guinea. Both of them are in our collection.

Distribution: The genus occurs in the southern and eastern Palaearctic, in the Oriental and Australian regions.

***Acosmeryx anceus* (Stoll, 1781)** (Plate 11 figs 11-20)

"*Anceus*. ...*Spninx* ..." - Stoll 1781: 124, pl. 355, fig. A. Type locality: "... l'Isle Moluque d'Amboine ..." [= Indonesia: Maluku Islands, Ambon Island].

= "*Zonilia mixtura*." - Walker 1864: 34. Type locality: "Aru." [= Indonesia: Maluku Islands, Aru Islands].

= "*Enyo cinnamomea* HS." - Herrich-Schäffer 1869: 3, Tab. [98], Fig. 558. Type locality: "Aus Nordaustralien." [= North Australia].

= "*A*.[*cosmeryx*] *Daulis*. Boisd." Boisduval 1875: 218. Type locality: "Décrit sur un individu unique et don't nous ignorons la patrie" [= unknown].

= "*A*.[*cosmeryx*] *anceus subdentata* subsp. nov." - Rothschild, Jordan 1903: 528. Type locality: "North India to Sambawa." [= North India: Megahalaya, Sikkim; Butan; Indonesia: Sumatra, Java].

= "*Acosmeryx anceus bismarckiana* ssp. n." - Brechlin, Kitching 2007: 7, Abb. 7, 8, 13. Type locality: "Papua New Guinea, W-New Britain prov., Talasea peninsula; Bulumuv (near Bulu Murli), rainforest, Lake Dakataua, 250 m; ...". [= Papua New Guinea: West Britain Province, Talasea Peninsula].

Material examined: 12♂, 2♀ Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 1♂ (Plate 11 figs 15-16), same locality, 04-06.II.2009; 8♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♀ (Plate 11 figs 19-20), same locality, 05-06.I.2009; 1♂, 1♀ (Plate 11 figs 17-18) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 6♂, same locality, 27-30.I.2009; 2♂ (Plate 11 figs 11-14), same locality, 25.I-02.II.2009; 1♂, same locality and date.

Note: The smallest species of the genus. The forewing with strong rose-purple sheen. Currently, it is divided into three subspecies, of which the nominotypical one inhabits New Guinea and surrounding islands.

Distribution: Widely distributed in the Oriental and Australian regions from North India in the northwest to Queensland, Australia in the southeast.

***Acosmeryx miskinoides* Vaglia, Haxaire, 2007** (Plate 12 figs 1-6)

"*Acosmeryx miskinoides* sp. n." - Vaglia, Haxaire 2007: 7. Type locality: "Nouvelle-Guinée, Morobe, Vallée de Wau en direction de Bulolo, ..." [= Papua New Guinea: Morobe Province, Wau].

Acosmeryx miskini auctorum, nec *Acosmeryx miskini* Murray, 1873.

Material examined: 1♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 31.XII.2008-02.I.2009; 4♂, same locality, 27-30.I.2009; 1♂, same locality, 31.I-02.II.2009; 2♂ (Plate 12 figs 1-4), 1♀ (Plate 12 figs 5-6) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 11♂, 2♀, same locality and date; 4♂ Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 04-06.II.2009.

Note: This species is very similar to *A. miskini* (Murray, 1873) from Queensland, Australia. They differ from each other in the minute details in the male genitalia. Beside that, they have a difference of 4% in the COI gene (Vaglia, Haxaire 2007). A rather common species.

Distribution: It is known in New Guinea and surrounding islands.

***Eupanacra* Cadiou, Holloway, 1989**

Eupanacra Cadiou, Holloway 1989: 139. Type species: *Panacra dohertyi* Rothschild, 1894, by original designation.

Note: Species of the genus are small or medium in size with an elongated forewing. A rather large genus including 23-25 species. Three species are known to occur in New Guinea, of which we have on hands only one species.

Distribution: Restricted to Oriental and Australian regions from North India in the northwest to Solomon Islands and Queensland, Australia in the southeast.

***Eupanacra micholitzi* (Rothschild, Jordan, 1893)** (Plate 12 figs 13-14)

"*Panacra Micholitzi*, sp. n." - Rothschild, Jordan 1893: 456. Type locality: "Simbang, near Finschhafen, German New Guinea ..." [= Papua New Guinea: Morobe Province, Simbang].

= "*Panacra hollandiae* sp. nov." - Clark 1931: 80. Type locality: "Dutch New Guinea." [= Indonesia: West Papua or Papua Province].

Material examined: 1♂ (Plate 12 figs 13-14) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: This species cannot be confused with any other Hawk moths of New Guinea because of the colour pattern on the wings. It is a rather rare species.
Distribution: It inhabits New Guinea and islands off to the east (the D'Entrecasteaux Islands).

***Eurypteryx* R. Felder, 1875**
"*Eurypteryx* ... Felder." - R. Felder 1875: 4, pl. 76, fig. 1. Type species: *Eurypteryx molucca* R. Felder, 1875, by monotypy.
= "*Indiana*, n. g." - Tutt 1903: 101 [nec *Indiana* Matthew, 1902 (Crustacea)]. Type species: *Darapsa bhada* Moore, 1865, by original designation.

Note: The wings of the species of the genus are brown with an indistinct pattern. Besides that, the males have a well-developed anal tuft. Currently, eight species are included into the genus, of which two are known to be from New Guinea. We have on hand a single species only.
Distribution: Restricted to Oriental and Australian regions from Nepal in the northwest to the Louisiade Archipelago in the southeast.

***Eurypteryx falcata* Gehlen, 1922** (Plate 12 figs 7-8)
"*Eurypteryx falcata* sp. n." - Gehlen 1922: 360, Abb. 1. Type locality: "Deutsch-Neue-Guinea, Kaiser-Wilhelm-Land ..." [= Northern part of Papua New Guinea].

Material examined: 1♂ (Plate 12 figs 7-8) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: This species is easily differentiated from the congener from New Guinea (*E. molucca* R. Felder, 1875) by the falciform apex and colour pattern of the forewing.
Distribution: This species seems to be endemic to the island of New Guinea.

***Macroglossum* Scopoli, 1777**
"*Macroglossum*. Scop." - Scopoli 1777: 414. Type species: *Sphinx stellatarum* Linnaeus, 1758, by monotypy.
= "*Psithyros* ..." Hübner 1819 ["1816"]: 132. Type species: *Sphinx stellatarum* Linnaeus, 1758, by subsequent designation by Rothschild, Jordan (1903: 616).
= "*Rhamphoschisma*. Mihi." - Wallengren 1858: 139. Type species: *Rhamphoschisma fasciatum* Wallengren, 1858 [= *Psithyros trochilus* Hübner, 1823 ["1806"]], fixed by original designation.
= "*Rhopalopsyche*, n. gen." - Boisduval 1875b: 239. Type species: *Rhopalopsyche nycteris* Kollar, 1844, fixed by original designation.

Note: Many authors (Fletcher, Nye 1982; Danner et al. 1998; Zolotuhin, Ryabov 2012) use the name "*Bombylia* Hübner, 1822", as a synonym of the genus *Macroglossum* Scopoli, 1777 which, in our opinion, is an unavailable name and should be completely excluded from Zoological Nomenclature. The generic name "*Bombylia*" appeared for the first time in Hübner's "Tentamen" (Hübner 1806). The latter was subsequently rejected for nomenclatural purposes by the International Commission on Zoological Nomenclature (ICZN 1926, 1954) as an unpublished work. Further, the name "*Bombylia*" is given in Hübner (1822) in the combination "*Bombylia vulgaris*" on pages 10, 11, 13 and as "*Bombylia aequivoca*" on page 12. These two species-group names are unavailable because they where not accompanied by either a description or a definition (nomen nudum) (Article 12.1. of the International Code of Zoological Nomenclature) (ICZN 1999) Therefore *Bombylia* Hübner, 1822 is an unavailable genus-group name on the basis of Article 67.1 of the International Code of Zoological Nomenclature (ICZN 1999). In accordance with the Article 11.5.2. of the International Code of Zoological Nomenclature (ICZN 1999) "the status of a previously unavailable name is not changed by its mere citation (that is, without adoption for a taxon) even if accompanied by a reference to the work in which the name was published but was not made available". Kirby in 1892 cited the name *Bombylia* as a synonym of the genus *Macroglossa* [sic!], but did not use it as the valid name ("*Bombylia*, Hübn. Tentamen, p. 1 (1810?)") (Kirby 1892: 629). Finally, Rothschild and Jordan also did not make this taxon available, quoting it in synonymy, but with an incorrect authorship by Kirby (Rothschild, Jordan 1903: 616).
A large genus which contains more than 110 described species. All of them are day-flying moths. At present, 23 species are known from New Guinea, of which we have on hands a single species only.
Distribution: This genus is distributed everywhere in the Old World, but with the greatest diversity in South-East Asia.

Macroglossum nubilum **Rothschild, Jordan, 1903** (Plate 12 figs 15-16)
"*Macroglossum nubilum* spec. nov." - Rothschild, Jordan 1903: 652, pl. 4, fig 17; pl. 50, fig. 46; pl. 56, fig. 26. Type locality: "... Milne Bay, Brit. N. Guinea, ..." [= Papua New Guinea: Milne Bay Province, Milne Bay].

Material examined: 1♂ (Plate 12 figs 15-16) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: This species can be easily distinguished from all congeners from New Guinea by the colour pattern of the hindwing and abdomen dorsally.
Distribution: It inhabits New Guinea and islands off to the east (Louisiade Archipelago). It is known in Queensland, Australia as well.

Hippotion **Hübner, 1819 ["1816"]**
"*Hippotion* ..." - Hübner 1819 ["1816"]: 135. Type species: *Sphinx celerio* Linnaeus, 1758, by subsequent designation by Kirby (1892: 747).
= "*Isoples* ..." - Hübner 1819 ["1816"]: 135. Type species: *Sphinx thyelia* Linnaeus, 1758, by subsequent designation by Kirby (1897: 24).
= "*Panacra*." - Walker, 1856 77 (key), 154. Type species: *Panacra lignaria* Walker, 1856 [= *Sphinx vigil* Guérin-Méneville, 1843; = *Sphinx velox* Fabricius, 1793], by subsequent designation (as *Sphinx vigil* Guérin-Méneville, 1843) by Moore (1882 [8]: 25).

Note: Species of the genus are ochre, brown or grey-brown in coloration, sometimes with bright pink or red hindwing. Usually the forewing has a longitudinal pattern. The genus includes up to 40 species, some of them are know as an extremely active vagrant. Seven species are known to occur in New Guinea. We have only three in our collection.
Distribution: This genus inhabits the Afrotropical, Oriental and Australian regions. The distribution of some species extends to the southern parts of the Palaearctic.

Hippotion velox **(Fabricius, 1793)** (Plate 12 figs 9-12)
"[*Sphinx*] *velox*." - Fabricius 1793: 378. Type locality: "... in India orientali ..." [= East India].
= "*Panacra lignaria*." - Walker 1856: 156. Type locality: "... Ceylon. ... Cape York, Australia." [= Sri Lanka; Australia: Queensland, Cape York Peninsula].
= "*C*.[*oerocampa*] *Yorkii*. Boisd." - Boisduval 1875a: 248. Type locality: "... du cap York ..." [= Australia: Queensland, Cape York Peninsula].
= "*Panacra rosea* sp. nov." - Rothschild 1894: 79. Type locality: "Lifu, Loyalty Islands." [= France (New Caledonia): Loyalty Islands, Lifou Island].
= "*Panacra lifuensis* sp. nov." - Rothschild 1894: 79. Type locality: "Lifu, Loyalty Islands." [= France (New Caledonia): Loyalty Islands, Lifou Island].
= "*Panacra griseola* sp. nov." - Rothschild 1894: 80. Type locality: "Lifu, Loyalty Islands." [= France (New Caledonia): Loyalty Islands, Lifou Island].
= "*Panacra pseudovigil* sp. nov." - Rothschild 1894: 80. Type locality: "?" [= unknown].
= "*Hippotion beddoesii* sp. nov." - Clark 1922: 19. Type species: "Suva, Fiji." [= Republic of Fiji: Viti Levu Island, Suva].
= "*Hippotion noel* sp. nov." - Clark 1923: 68. Type locality: "Christmas Island." [= Australia: Christmas Island].

Material examined: 2♂, 1♀ (Plate 12 figs 11-12) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂ (Plate 12 figs 9-10), same locality, 25.I-02.II.2009; 1♂, same locality, 31.I-02.II.2009; 1♂ Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: A very common species, which can be easily differentiated from all congeners from New Guinea by the colour pattern of the forewing.
Distribution: It occurs from India in the west to the Fiji Islands in the east.

Hippotion boerhaviae **(Fabricius, 1775)** (Plate 12 figs 17-22)
"[*Sphinx*] *Boerbaviae*." - Fabricius 1775: 542. Type locality: "... in Indiae ..." [= India].

Material examined: 1♂ (Plate 12 figs 17-18) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 2♂, same locality and date; 1♂, same locality, 28.XII.2008; 2♂, 1♀, same locality, 04-06.II.2009; 1♂ (Plate 12 figs 19-20), 1♀ (Plate 12 figs 21-22), same locality, 05.II.2009; 1♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: There is still no consensus on the systematic position of this taxon because many researches believe that it is conspecific with *H. rosetta* (Swinhoe, 1892). We accept it as a distinct species.
Distribution: This species is widespread from India in the west to the Fiji Islands in the east.

8 – The dates of publication of the "Lepidoptera of Ceylon" by Moore were discussed by Griffin (1939).

***Hippotion brennus* (Stoll, 1782)** (Plate 12 figs 23-30)

"*Brennus*. ... *Sphinx* ..." - Stoll in Cramer 1782: 233, pl. 398, fig. B. Type locality: "... l'Isle Molucque d'Amboine, ..." [= Indonesia: Maluku Islands, Ambon Island].
= "*Choerocampa Johanna*." - Kirby 1877: 241. Type locality: "Brisbane." [= Australia: Queensland, Brisbane].
= "*Hippotion rubribrenna*, sp. n." - Joicey, Kaye 1917: 307. Type locality: "Dutch New Guinea, Central Arfak Mts., 3500 ft., ..." [= Indonesia: West Papua, Arfak Mts.].
= "*Hippotion brennus funebris* m. subspec. nova." - Gehlen 1926: 175. Type locality: "Malu, am Kaiserin-Augusta Fluß (Sepik) in Neu-Guinea, ca. 100 km von der Küste entfernt." [= Papua New Guinea: ca 100 km upstream of the Sepik River mouth].
= "*Hippotion novaebrittaniae* sp. nov." - Clark 1932: 41. Type locality: "New Britain." [= Papua New Guinea: New Britain Island].
= "*Hippotion brennus viettei* n. subsp." - Darge 1975: 180. Type locality: "Lorengau, Manu Island, ..." [= Republic of Fiji: Mamanuca Islands, Manu Island].

Material examined: 1♂ (Plate 12 figs 25-26) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 1♂ (Plate 12 figs 23-24), same locality, 04-06.II.2009; 1♂ (Plate 12 figs 27-28) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 1♂, same locality, 25.I-02.II.2009; 1♂ (Plate 12 figs 29-30) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 4♂, same locality and date.
Note: This very common and rather variable species can be distinguished from all congeners from New Guinea by the coloration of the hindwing and the coloration of the abdomen.
Distribution: It occurs in New Guinea and surrounding islands from north Maluku Islands in the west to the Solomon Islands in the east, known to occur in Queensland, Australia as well.

***Theretra* Hübner, 1819 ["1816"]**

"*Theretra* ..." Hübner 1819 ["1816"]: 135. Type species: *Sphinx equestris* Fabricius, 1793 [= *Sphinx nessus* Drury, 1773], by subsequent designation (as *Sphinx nessus* Drury, 1773) by Kirby (1892: 659).
= "*Oreus* ..." - Hübner 1819 ["1816"]: 136. Type species: *Sphinx gnoma* Fabricius, 1775, by subsequent designation by Rothschild, Jordan 1903: 387.
= "*Gnathostypsis*. Mihi." - Wallengren 1858: 137. Type species: *Gnathostypsis ostracina* Wallengren, 1858 [= *Sphinx capensis* Linnaeus, 1764], by original designation.
= "*Hathia*." - Moore 1882[9]: 19. Type species: *Sphinx clotho* Drury, 1773, by subsequent designation by Kirby (1883: 183).
= "*Florina*, n. g.," - Tutt 1903a: 76. Type species: *Choerocampa japonica* Boisduval, 1867, by original designation.
= "*Lilina*, n. g." - Tutt 1903b: 101. Type species: *Sphinx pinastrina* Butler, 1876 [= *Choerocampa balsaminae* Walker, 1856], by original designation.

Note: Superficially, the species of this genus are very similar to the previous one, but they can be distinguished by the structure of the labial palpus. At present, the genus contains slightly more than 60 species. Only 13 species of the genus are known from New Guinea, of which eight are present in our collection.
Distribution: Restricted to tropics and subtropics of the Old World. It is known from the southern part of the Palaearctic Region as well. Some species are active migrants and can be found far away from their native area.

***Theretra nessus* (Drury, 1773)** (Plate 13 figs 1-6)

"*Nessus*. ...*Sph*.[*inx*]" - Drury 1773: [91], pl. 27, fig. 1. Type locality: "... Madras." (Drury, 1773: 46) [= India: Tamil Nadu State, Chennai].
= "[*Sphinx*] *equestris*." - Fabricius 1793: 365. Type locality: "... in India orientali ..." [= East India].
= "*Chaerocampa* [sic!] *Nessus* Cr. v. *rubicundus*" - Schaufuss 1870: 18. Type locality: "[Java]" [Indonesia: Java Island].
= "*Theretra nessus albata* ssp. n." - Fukuda 2003: 118, figs 1-4, 11. Type locality: "Fiji, Viti Levu Is., Nuku, ..." [= Republic of Fiji: Viti Levu Island].

Material examined: 1♂, 7♀ Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 1♂, 4♀, same locality, 04-06.II.2009; 1♂ (Plate 13 figs 1-2) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 4♂, 1♀, same locality and date; 4♂, 1♀ (Plate 13 figs 5-6) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.

9 – Pages 1-32 and plates 72-89 of the second volume of Moore's "Lepidoptera of Ceylon" were issued 31 August 1882. Dates of publication of this work were discussed by Griffin (1939).

II.2009; 1♀, same locality and date; 1♀, same locality, 30.XII.2008-02.I.2009; 1♀ (Plate 13 figs 3-4), same locality, 25.I.2009; 1♀, same locality and date; 4♀, same locality, 27-30.I.2009.
Note: This species can be easily distinguished from other congeners from New Guinea by the presence of two golden stripes on the abdomen. It is a most common species as in New Guinea, and within the area of its distribution. Currently this species is divided into two subspecies, which we think is hardly justified.
Distribution: This species is widespread in the Indo-Australia from India in the west and Japan in the north to Fiji in the east and Australia in the south.

***Theretra insularis* (Swinhoe, 1892)** (Plate 13 figs 7-10)
"*Choerocampa insularis*. n. sp." - Swinhoe 1892: 18. Type locality: "Ceram ... Ké ..." [= Indonesia: Maluku, Seram Island, Kei Islands].
= "*Theretra rhesus valens*, subsp. n." - Jordan 1926: 108. Type locality: "... Talasea, New Britain ..." [= Papua New Guinea: West New Britain Province, Talasea District].
= "*Theretra rhesus mollis*, subsp. n." - Jordan 1926: 108. Type locality: "... St. Mathias [sic!] and Squally Islands ..." [= Papua New Guinea: New Ireland Province, St. Matthias Islands].
= "*Theretra rhesus lenis*, subsp. n." - Jordan 1926: 108. Type locality: "Solomon Islands, ...".
= "*Theretra insularis ambrymensis* subsp. n." - Lachlan 2004: 169, figs 1-3, 7. Type locality: "Vanuatu: Olal Catholic Mission area, north Ambrym Is., ..." [= Vanuatu: Ambrym Island].

Material examined: 1♂ (Plate 13 figs 9-10) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 1♂, same locality and date; 1♂ (Plate 13 figs 7-8), same locality, 04-06.II.2009; 2♂ Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008-02.I.2009; 7♂, 1♀, same locality, 25.I-02.II.2009; 1♀, same locality, 27-30.I.2009.
Note: This species has been revised by Vaglia and coauthors (Vaglia et al., 2010). They have shown that this species is divided into five subspecies, of which the nominotypical one populates the island of New Guinea. A rather common species.
Distribution: It occurs in New Guinea and surrounding islands from Seram in the west to Vanuatu in the east.

***Theretra radiosa* Rothschild, Jordan, 1916** (Plate 13 figs 11-14)
"*Theretra radiosa* spec. nov." - Rothschild, Jordan 1916: 263. Type locality: "... Goodenough Island, 2500-4000 ft., ... type; ..." [= Papua New Guinea: Milne Bay Province, D'Entrecasteaux Islands, Goodenough Island].

Material examined: 1♂ (Plate 13 figs 13-14) Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008-02.I.2009; 1♂ (Plate 13 figs 11-12), same locality, 27-30.I.2009.
Note: Superficially this species is similar to the previous one, but differs from it in some details of the coloration of the wings and abdomen.
Distribution: This species occurs in New Guinea and surrounding islands from the Raja Ampat Islands in the west to the Louisiade Archipelago in the east. It is known in Queensland, Australia as well.

***Theretra silhetensis* (Walker, 1856)** (Plate 13 figs 15-16)
"*Chaerocampa* [sic!] *Silhetensis*." - Walker 1856: 143. Type locality: "Ceylon. ... North India. ... Silhet. ... Nepaul. ... North China. ..." [= Sri Lanka; North India; Bangladesh: Silhet; Nepal].
= "*Chaerocampa* [sic!] *bisecta*, Horsfield Sp." - Moore 1858 ["1857"]: 278. Type locality: "Java. ... N. India. ..." [= Indonesia: Java; North India].
= "*Chaerocampa* [sic!] *intersecta*, n. sp." - Butler 1875c: 623. Type locality: "Queensland ..." [= Australia: Queensland].

Material examined: 1♂ (Plate 13 figs 15-16) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008.
Note: Superficially this species is similar to two previous species, but differs from them by the presence of the bright silvery-white line on the abdomen dorsally and in some details of the coloration of the wings. Besides that, it is the smallest species of the genus. Currently this species is divided into two subspecies, of which ssp. *intersecta* Butler, 1875 is known to be from New Guinea.
Distribution: It is widespread from the North India and Nepal in the west to the Vanuatu Archipelago in the east.

***Theretra celata* (Butler, 1877)** (Plate 13 figs 17-18)
"*Chaerocampa* [sic!] *celata*, n. sp." - Butler 1877b: 472. Type locality: "Cape York." [= Australia:

Queensland, Cape York Peninsula].
= "*C.*[*haerocampa*] [sic!] *Cloacina*, n. sp." - Miskin 1891: 16. Type locality: "... Brisbane ..." [= Australia: Queensland, Brisbane].
= "*Choerocampa luteotincta*, nov. sp." - Lucas 1891: 894. Type locality: "Brisbane." [=Australia: Queensland, Brisbane].
= "*Theretra babarensis* spec. nov." - Eitschberger 2005: 264, Farbtaf. 18, Abb. 1, 2; Taf. 1, Abb. 1-6; Taf. 2, Abb. 1-6; Taf. 3, Abb. 1-6; Taf. 4, Abb. 3-6; Taf. 5, Abb. 1-5; Taf. 6, Abb. 1-3; Taf. 7, Abb. 2-4; Taf. 8, Abb. 2-4. Type locality: "Indonesia, Moluccas, 7-10 m, Babar Archipel, Wetan [sic!] Island, ..." [= Indonesia: Maluku Islands, Babar Islands, Wetar Island].

Material examined: 1♂ (Plate 13 figs 17-18) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: This species has been revised by Vaglia and coauthors (Vaglia et al. 2010). They divided this species into two subspecies, of which the nominotypical one inhabits the Island of Papua New Guinea.
Distribution: This species occurs in New Guinea and surrounding islands from Buru and Seram in the west to Solomon Islands in the east. It is found in northern Queensland, Australia as well.

***Theretra indistincta* (Butler, 1877)** (Plate 14 figs 1-4)
"*Choerocampa indistincta*, n. sp." - Butler 1877a: 460. Type locality: "Rockhampton, Queensland." [= Australia: Queensland, Rockhampton].
= "*C.*[*haerocampa*] [sic!] *Cleopatra*, n. sp." - Miskin 1891: 15. Type locality: "Brisbane." [= Australia: Queensland, Brisbane].
= "*Choerocampa curvilinea*, nov. sp.," - Lucas 1891: 834. Type locality: "Brisbane." [= Australia: Queensland, Brisbane].
= "*Theretra clotho manuselensis*, subsp. nov." - Joicey, Talbot 1921: 108. Type locality: "... Mount Manusela, Central Ceram, 6000 ft., ..." [= Indonesia: Maluku Islands, Seram Island].
= "*Theretra clotho papuensis*, subsp. nov." - Joicey, Talbot 1921: 108. Type locality: "Wandammen Mts., 3-4000 ft. D. N. Guinea ..." [= Indonesia: West Papua Province, Wandammen Peninsula, Wandammen Mts.], designated by lectotype fixed by Lachlan (2009: 85).
= "*Theretra indistincta bismarcki*, subsp. n." - Jordan 1926: 208. Type locality: "A series from the Bismarck Archipelago. Type from New Ireland." [= Papua New Guinea: New Ireland Province, New Ireland Island].

Material examined: 1♂ (Plate 14 figs 1-2) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 04-06.II.2009; 1♂, same locality and date; 1♀ (Plate 14 figs 3-4) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: Habitually this species is similar to the previous one, but can be distinguished from it by the presence of pinkish scales on the antenna, upper side of the wings and abdomen. Currently it is divided into four subspecies, of which ssp. *papuensis* Joicey, Talbot, 1921 populates the island of New Guinea.
Distribution: This species populates the islands from Sulawesi and Maluku Islands in the east to Bismarck and the Louisiade Archipelago in the east and the province of Queensland, Australia in the south.

***Theretra tabubilensis* Lachlan, 2009** (Plate 14 figs 5-8)
"*Theretra tabubilensis* n. sp." - Lachlan 2009: 85, figs 10, 11, 20. Type locality: "Papua New Guinea. Tabubil, Western Province, ..." [= Papua New Guinea: Western Province, Tabubil].

Material examined: 2♂ (Plate 14 figs 5-8) Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: Superficially, this species resembles *Th. indistincta* (Butler, 1877), but it is slightly smaller and without pinkish scales.
Distribution: This species seems to be endemic to New Guinea and nearby islands.

***Theretra latreillii* (W.S. MacLeay, 1826 ["1827"])** (Plate 14 figs 9-12)
"*Sphinx Latreillii*, (n. s.)" - W.S. Macleay 1826 ["1827"] [10]. 464. Type locality: not stated [= Australia?].
= "*Chaerocampa* [sic!] *comminuens*." - Walker 1864: 31. Type locality: "Moreton Bay." [= Australia: Queensland, Moreton Bay].
= "*Chaerocampa* [sic!] *deserta*, n. sp." - Butler 1876: 638. Type locality: "Hunter River, Australia ..." [= Australia: New South Wales].
= "*Choerocampa Walduckii*, n. sp." - Butler 1877c: 398, pl. 9, fig. 2. Type locality: "Australia ..." [= Australia: Queensland].
= "*Choerocampa amara*, n. sp." - Swinhoe 1892:

10 – According to Sherborn, "this work was issued 10 Ap. 1826" (Sherborn 1922: lxxiii).

21, pl. 1, fig. 9. Type locality: "Mysol ... Amboyna ..." [= Indonesia: West Papua, Raja Ampat Islands, Misool; Maluku, Ambon Island].
= "*Theretra prattorum* sp. nov." - Clark 1924: 19. Type locality: "Kako Tagalago, central Buru, 2700 ft. May, 1922, ..." [= Indonesia: Maluku Islands, Buru Island].

Material examined: 1♂ (Plate 14 figs 9-10) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 4♂, same locality and date; 1♀ (Plate 14 figs 11-12) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 25.I-02.II.2009.
Note: This species differs from all congeners from New Guinea by the absence of a black spot on the abdomen laterally at the base. Presently, it is divided into three subspecies, of which the nominotypical one inhabits New Guinea.
Distribution: This species is widespread in the Indo-Australia from India in the west and Southeast China and Taiwan in the north to the Solomon Islands in the east and Australia in the south.

***Theretra tryoni* (Miskin, 1891)** (Plate 14 figs 13-18)
"*C.*[*haerocampa*] [sic!] *Tryoni*, n. sp." - Miskin 1891: 17. Type locality: "Brisbane." [= Australia: Queensland, Brisbane].

Material examined: 2♂ (Plate 14 figs 13-16) Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26-29.XII.2008; 2♂, 4♀, same locality and date; 1♀ (Plate 14 figs 17-18) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009; 1♀, same locality and date.
Note: Superficially, this species is somewhat similar to the previous one, but differs from it because of the presence of a black spot on the abdomen laterally at the base. It is a rather common species.
Distribution: From Sulawesi in the west to Fiji in the east and Queensland, Australia in the south.

***Cechenena* Rothschild, Jordan, 1903**
"*Cechenena* gen. nov." - Rothschild, Jordan 1903: 674 (key), 799. Type species: *Philampelus helops* Walker, 1856, by original designation.
Note: This genus is closely related to the two previous genera and differs from them in the structure of the labial palpus and fore and hind tarsi. More recently, this genus had included 12 species, but Zolotuhin with Ryabov separated four species into a distinct genus *Cechetra* Zolotuhin, Ryabov, 2012 with the type species of *Cechenena subangustata* Rothschild, 1920 (Zolotuhin, Ryabov 2012). Thus, at the present time the genus *Cechenena* includes only eight species.
Distribution: Restricted to Oriental and Australian regions from North India in the west to New Guinea and nearby islands in the east.

***Cechenena helops* (Walker, 1856)** (Plate 14 figs 19-24)
"*Philampelus Helops*." - Walker 1856: 180. Type locality: "Port Natal." [= South Africa: KwaZulu-Natal Province, Durban [11]].
= "*Philampelus orientalis* Felder." - R. Felder 1875: 8, pl. 77, fig. 1. Type locality: "Sikkim (Stolicka)" [= India: State Sikkim].
= "*C.*[*echenena*] *helops papuana* subsp. nov." - Rothschild, Jordan 1903: 802. Type locality: "Milne Bay, ..." [= Papua New Guinea: Milne Bay Province, Milne Bay].
= "*Cechenea* [sic!] *helops interposita*, subsp. nov." - Joicey, Talbot 1921: 108. Type locality: "Mout Mansuela, Central Ceram, 6000 ft., ..." [= Indonesia: Maluku Islands, Seram Island].

Material examined: 1♂ Indonesia, Papua, Genyem env., 02˚38'S, 140˚10'E, 500 m, 30.XII.2008-02.I.2009; 3♂, 1♀ (Plate 14 figs 23-24), same locality, 25.I.2009; 1♂ (Plate 14 figs 21-22), same locality, 25.I-02.II.2009; 1♂ (Plate 14 figs 19-20) Indonesia, Papua, Taritatu riv., SE from Dabra, 03˚15'S, 138˚34'E, 60 m, 05-16.I.2009.
Note: This species cannot be confused with any other Hawk moths of New Guinea because of the coloration of wings and body. Currently, it is divided into three subspecies, of which the subspecies ssp. *papuana* Rothschild, Jordan, 1903 populates New Guinea and Bismarck Archipelago. A very common species.
Distribution: It is widespread from the North India in the west to the Bismarck Archipelago in the east.

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11 – As stated Fletcher and Nye: "this evidently incorrect, for the species does not occur in Africa, but is widely distributed in the Oriental Region" (Fletcher, Nye 1982: 32).

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Species of *Ditropopsis* E.A. Smith, 1897 (Architaenioglossa: Cyclophoridae) from the Papuan region: taxonomic review

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Abstract: The gastropod genus *Ditropopsis* E.A. Smith, 1897 (Architaenioglossa: Cyclophoridae) from New Guinea, Raja Ampat and the Moluccan Archipelago is revised. Six informal species groups of 27 species are recognized for the study region including twelve new species, which are described and illustrated: *Ditropopsis alta* sp. nov., *D. halmaherica* sp. nov., *D. magna* sp. nov., *D. majalibit* sp. nov., *D. monticola* sp. nov., *D. pallidioperculata* sp. nov., *D. pyramis* sp. nov., *D. tamarau* sp. nov., *D. telnovi* sp. nov., *D. unicarinata* sp. nov., *D. waigeoensis* sp. nov., and *D. wallacei* sp. nov. Redescriptions of two insufficiently described species are given. An updated faunal checklist, key to *Ditropopsis* species and a short biogeographical analysis are presented for the Papuan region.

Key words: Mollusca, Gastropoda, Cyclophoridae, *Ditropopsis*, Papuan region, the Moluccas, Raja Ampat, New Guinea, taxonomy, biogeography, new species, identification, endemism.

Introduction

Until recently (Greķe 2011a, 2011b) the genus *Ditropopsis* E.A. Smith, 1897 was considered a small and insignificant element of the Papuan malacofauna, with only eight previously described species. Earlier records from the region were restricted to Ambon and Haruku Islands in the Central Moluccas, Misool Island in southern Raja Ampat, and the Onin Peninsula, Biak Island and Madang area of New Guinea.

Recent sampling efforts starting in 2009, generated numerous new records, broadening the distribution area of *Ditropopsis* toward the North (North Maluku) and South-East (Bird's Neck isthmus of New Guinea) and resulted in the description of five new taxa and the first ever checklist and identification key to the Papuan species (Greķe 2011a, 2011b).

In the present work, twelve additional species are described from the Bird's Head Peninsula of New Guinea and Raja Ampat Islands: *Ditropopsis alta* sp. nov., *D. halmaherica* sp. nov., *D. magna* sp. nov., *D. majalibit* sp. nov., *D. monticola* sp. nov., *D. pallidioperculata* sp. nov., *D. pyramis* sp. nov., *D. tamarau* sp. nov., *D. telnovi* sp. nov., *D. unicarinata* sp. nov., *D. waigeoensis* sp. nov., and *D. wallacei* sp. nov. Additionally, two insufficiently known species - *D. ingenua* (O. Boettger, 1891) and *D. moellendorffi* (O. Boettger, 1891) - are redescribed and new information on the distribution of several previously known species is presented and an updated species checklist and identification key to the Papuan *Ditropopsis* are presented. Biogeographical patterns and endemism are discussed in brief.

Diagnoses of recently described or redescribed species (Greķe 2011a, 2011b) or those sufficiently described by earlier authors are not being repeated in this work.

Currently the genus *Ditropopsis* is represented by 27 species in the Papuan region, of them 25 described and two species remain unnamed. It makes *Ditropopsis* of one among the species-richest genera of terrestrial molluscs in this area.

Material and Methods

All specimens described below were collected by hand and are preserved in 100% ethanol, except historical type material, which is stored dry. Specimens were studied using a Leica S6D stereomicroscope. Specimen photographs were taken using a Canon EOS 450D SLR camera attached to the microscope, and CombineZP (© Alan Hadley) software was used for image stacking. Holotypes of the newly described species are deposited in the collection of Natural History Museum of Erfurt. All species are listed alphabetically, since a phylogenetic arrangement is impossible. All label data are reproduced exactly, with no corrections or additions; labels (if more than one for the same specimen) are separated by slashes (/). If not stated otherwise, all labels are printed. Author's comments are placed in square brackets [ ].

In the present publication, two types of shell carinae are being differentiated. 'External carinae' are those on the surface of shell including the basal carina encircling the umbilicus, but not counting carinae in the umbilical channel. 'Umbilical carinae' are those located within umbilical channel. For species with free whorls forming a cornucopia-like shell I always give the total number of carinae, because these species lack a true umbilicus, as far as their whorls are not attached to one another. I also introduce the conception of 'detached' apical whorl(s), e.g. free apical whorls resulting in shell umbilicus being open from the top (umbilical channel visible in apical view).

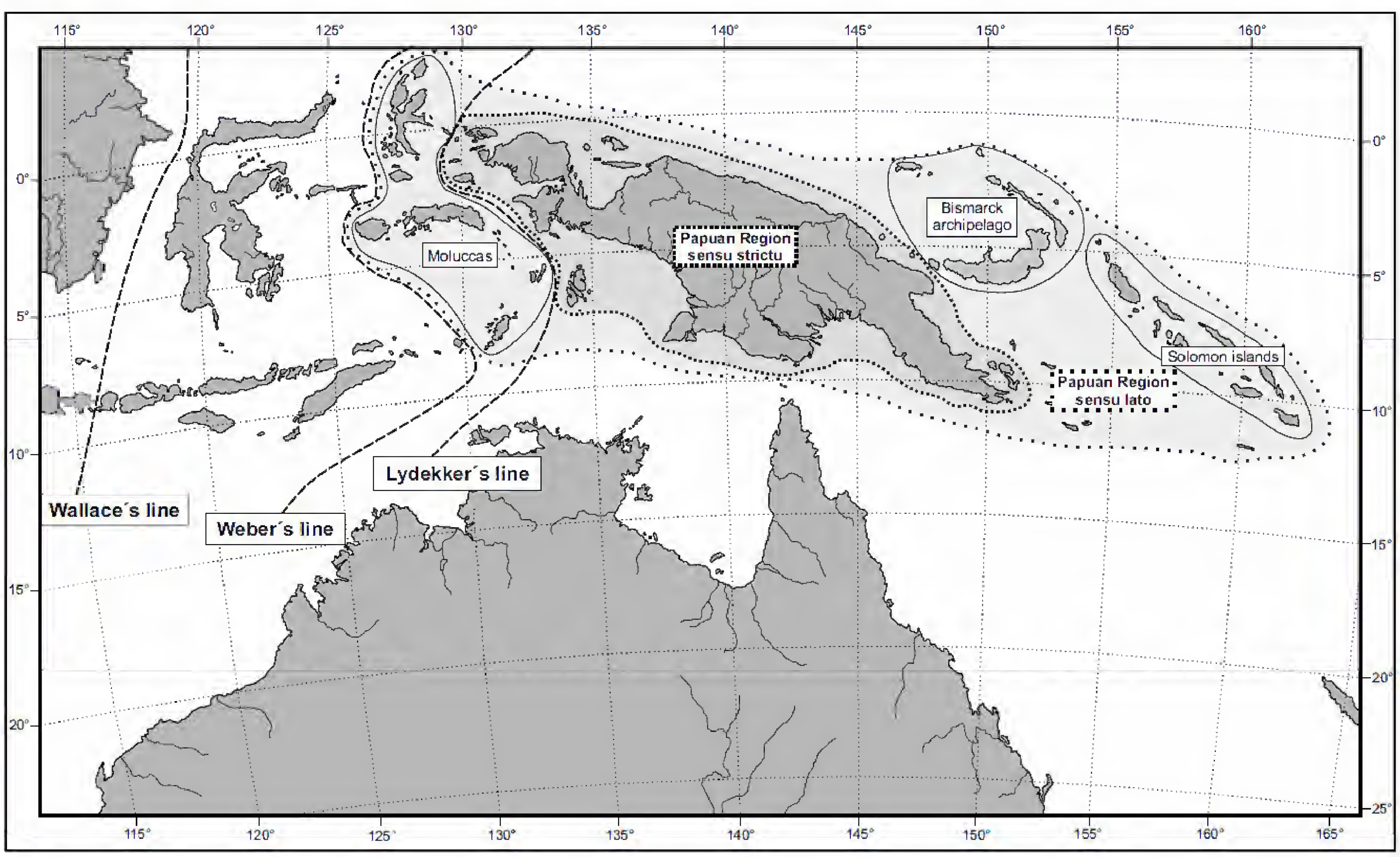
Acronyms used in the text:

BMNH – British Museum (Natural History), London, U.K.;
KGC – collection Kristine Greķe, Dzidriņas, Latvia;
MBBJ – Museum zoologicum bogoriense, Cibinong, Indonesia;
NME – Naturkundemuseum Erfurt, Germany;
RMNH – Rijksmuseum van Natuurlijke Histoire, Leiden, the Netherlands;
SMF – Senckenberg Forschungsinstitut und Naturmuseum, Frankfurt am Main, Germany;
FSMC – Florida Museum of Natural History, University of Florida, Gainesville, U.S.A.

Definition of the geographical area

The zoogeographic term 'Papuan Region' (or the Papuan subregion of the Australian region) commonly occurs in zoological literature. 'New Guinea' sometimes is incorrectly used as a synonym for this term (Darlington 1962; 1971). In this paper I follow the concept of it defined by Gressitt (1982), Beehler et al. (1986), and Riedel (2002).

The study area is relatively easy to define as the Sahul continental shelf islands with the Pacific Ocean north and east of New Guinea and Torres Strait south of it. The situation is different in the west where chains of islands extend between the Sahul shelf and Sunda shelf. These islands, the Moluccas, have a high percentage of Papuan faunal elements similar to the Solomon Islands, which are also considered part of the Papuan region. Consequently, the Moluccas are included in the study region, but other islands to the west, for example, Sulawesi and to the south-west of New Guinea (e.g. Timor, and Nusa Tenggara) are excluded. Gener-



Map 1. Map of New Guinea and the adjacent territories defining the study area. The 'Papuan Region s. s.' is shaded in medium grey. The 'Papuan Region s. l.' (= study area) is shaded in pale grey (from Riedel 2002).

ally, I follow the Weber's Line as a line of faunal balance, east of which the Papuan faunal elements are in numerical superiority over Oriental elements (Whitmore 1981). The study area is presented on map 1.

A western part of the study area (Indonesian provinces of Northern and Central Moluccas in particular) is defined as one among 25 World biodiversity hotspots (Myers et al. 2000).

The genus *Ditropopsis* E.A. Smith

The genus *Ditropopsis* was established by E.A. Smith (1897) for *Ditropopsis papuana* and '*D.* (?) *fultoni*'. *Ditropopsis papuana* E.A. Smith, 1897 is the type species of the genus by original designation (correcting Greķe 2011a). According to E.A. Smith (1897: 417), *Ditropopsis* s. str. differs from related taxa in having derivative operculum, e.g. with median process on outer side. Fukuda (2000) listed the following subgenera of *Ditropopsis*: *Ditropopsis* s. str., *Diaspira* Soós, 1911, *Ditropiphorus* Fukuda, 2000, and *Ditropisena* Iredale, 1933. *Diaspira* was synonymized with *Ditropopsis* (Greķe 2011a) and *Ditropisena* was moved to the Assimineidae (Fukuda & Ponder 2003). I am not familiar with the morphology and anatomy of *Ditropiphorus*, which considered an element of the Oriental malacofauna and never reported from the area East of Wallace's Line and I cannot comment on the current position of this taxon. Consequently, all Papuan species belong to nominative subgenus *Ditropopsis* s. str.

Commonly using conchiological characters only, like shell shape and structure, earlier authors have largely ignored opercular characters. In fact, the operculum is highly variable in all Papuan *Ditropopsis*, with specific peculiarities in structure and shape. In this work I use the term 'simple operculum', what actually means plesiomorphic for the Papuan *Ditropopsis*, but apomorphic for the Cyclophoridae (should not be considered as 'primitive'). This plesiomorphic type of operculum consists of two plates (internal and external) connected by short to very short median tube; it is concave exteriorly in all Papuan *Ditropopsis*. This type of operculum occurs in *D. fultoni* E.A. Smith, 1897, *D. heterospirifera* (van Benthem Jutting, 1958), *D. magna* sp. nov., *D. moellendorffi* (O. Boettger, 1891), *D. pyramis* sp. nov.

'Derivative opercula' are those apomorphic for the Papuan *Ditropopsis*, with narrow or broad short or long pubescent or non-pubescent median periostracal process on the external surface. Usually this process ends in a median pit (in *D. papuana* E.A. Smith, 1897 according to the original description and figure given by E.A. Smith, the median process is triangular in shape). Such operculum occurs in remaining 18 Papuan species.

The opercula of four species: *Ditropopsis aenigmatica* (van Benthem Jutting, 1963), *Ditropopsis spiralis* (O. Boettger, 1891), and two undescribed species, listed as 'sp.' in the present publication are unknown.

All Papuan *Ditropopsis* species are associated with calcareous limestone (karst) formations, calcareous soils or dolomite. The most recent collections were made from limestone's areas on the islands of Misool, Waigeo, and New Guinea's Onin Peninsula and Bird's Neck isthmus. *Ditropopsis* usually inhabit primary rainforests with permanent leaf litter. In almost all cases specimens are found on the underside of decomposing leaves and not on bare soil, under rocks or on decomposing wood. *Ditropopsis* do not show preference for large or small leaves and are found in moist to very moist microstations. Sometimes specimens of the same species are found in aggregations in a small forest patch or around a large tree, but not in nearby visually similar areas within the rainforest.

Papuan *Ditropopsis* are known from the Moluccas, Raja Ampat Islands and Indonesian New Guinea, but are not yet reported from southern and eastern New Guinea or the Solomon Islands.

Even according to our limited data on the distribution of species of *Ditropopsis* in the Papuan region, it is quite clear that these small terrestrial snails demonstrate very high level of local endemism. Because species appear to be restricted to moist microhabitats within rainforests, it is likely that habitat modifications, that affect forest cover or hydrology, would adversely impact populations of *Ditropopsis*.

Species groups

Six species groups are herewith defined within Papuan *Ditropopsis*, based on conchiological characters. It should be emphasized, that these species groups are established as an informal groups of convenience. Polyphyletic origin is not excluded for any of these groups. 15 species were placed into 6 newly defined groups, another 12 species were not placed in any of the groups primarily because their shells and/or opercular characters were unique.

***Ditropopsis benthemjuttingi* group**

Shell brown, low conical; whorls are convex, apical whorls are attached to the spire. Shell bears one or two strong carinae. Umbilicus width about 1/3 of the shell diameter, peristome thickened, double. Operculum derivative.

The following species are herewith placed in this group: *D. benthemjuttingi* Greķe, 2011a, *D. obiensis* Greķe, 2011b, *D. wallacei* sp. nov.

Ditropopsis mirabilis group

Shell creamy coloured, cornucopia-like, whorls more of less distinctly free (except 1½-2 embryonic ones). Shell bears three or more carinae, peristome slightly thickened. Operculum derivative with tubular process.

The following species are herewith placed in this group: *D. biroi* Soós, 1911, *D. mirabilis* Greķe, 2011a, *D. spiralis* (O. Boettger, 1891).

***Ditropopsis moellendorffi* group**

Shell shiny and transparent, cream. Shell shape low conical, depressed, with bulging apical whorls. Apical whorls are attached to the spire. Whorls almost 4, bears two or three strong carinae. Umbilicus wide. Operculum simple or derivative with very short process.

The following species are herewith placed in this group: *D. halmaherica* sp. nov., *D. moellendorffi* (O. Boettger, 1891).

***Ditropopsis fultoni* group**

Shell shape conical, shiny, transparent, yellowish, whorls (about 5) are convex, apical whorls partly detached from the spire; first 1½ whorl is tilted over obliquely to one side and partly covers the umbilical opening on top of the shell. Shell bears two or three strong and continuous carinae, one carina disappears after some whorls. Umbilicus wide. Peristome thickened, slightly double. Operculum derivative.

The following species are herewith placed in this group: *D. fultoni* E.A. Smith, 1897, *D. tritonensis* Greķe, 2011a.

***Ditropopsis tamarau* group**

Shell transparent; colour light brown. Shell shape conical. Whorls 5, convex, apical whorls are attached to the spire; shell bears one or two strong carinae. Umbilicus wide. Peristome thickened and double. Operculum derivative.

The following species are herewith placed in this group: *D. pallidioperculata* sp. nov., *D. tamarau* sp. nov., *D. unicarinata* sp. nov.

***Ditropopsis telnovi* group**

Shell transparent; colour creamy. Shell shape conical. Whorls about 5, apical whorls partly detached from the spire; first 2 whorls are tilted over obliquely to one side and partly the umbilical opening on top of the shell. Shell bears three strong external carinae and two or three fine umbilical carinae. Umbilicus wide. Peristome thickened. Operculum derivative with broad and short process.

The following species are herewith placed in this group: *D. telnovi* sp. nov., *D. waigeoensis* sp. nov.

Additional faunal information on *Ditropopsis* species from the Papuan region

***Ditropopsis* (s. str.) *benthemjuttingi* Greķe, 2011a**

Material, 3 specimens KGC: INDONESIA E, Raja Ampat, Misool Island S, Biga vill. ~7,50 km W, River Biga valley, 02°01'23"S, 130°12'38"E, 45-78 m, 03.II.2012, primary lowland rainforest on limestone, at base of limestone hill, leg. D.Telnov; 6 specimens NME & 7 KGC: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50"S, 130°11'09"E, 70-350 m, 04-06.II.2012, primary lowland rainforest on limestone, leg. D.Telnov.

Variability: Three subadult specimens with shells lacking spiral striation but radial lines present.
Ecology: Specimens were sampled from underside of decomposing leaves, in dense leaf litter of primary lowland rainforest at base of a limestone hill.
Note: The holotype of this species was incorrectly listed for River Biga valley by Greķe (2011a: 70), but in fact mentioned specimens were collected in the valley of River Gam. Therefore, the holotype label of this species should read 'INDONESIA E, Prov. Raja Ampat, distr. Misool Barat, Lilinta (Lelintah) vill. ~13,5 km NW, Gam vill. ~11 km NWW, River Gam valley in the middle of course, 01°57'49"S, 130°11'10"E, 03.IV.2009, primary lowland rainforest on limestone, leg. K.Greķe'.

***Ditropopsis* (s. str.) *heterospirifera* (van Benthem Jutting, 1958)**

Material, 4 specimens KGC: INDONESIA E, Raja Ampat, Misool Island S, Biga vill. ~7,50 km W, River Biga valley, 02°01'23"S, 130°12'38"E, 45-78 m, 03.II.2012, primary lowland rainforest on limestone, at base of limestone hill, leg. D.Telnov; 1 specimen KGC: INDONESIA E, Raja Ampat, Misool Island S, between Lilinta (Lelintah) and Biga vill., 02°02'14"S, 130°16'14"E, 20 m, 03.II.2012, primary lowland rainforest, leg. D.Telnov; 5 specimens KGC: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50"S, 130°11'09"E, 70-350 m, 04-06. II.2012, primary lowland rainforest on limestone, leg. D.Telnov; 2 specimens SMF & 3 KGC: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50"S, 130°11'09"E, 350 m, 06.II.2012, primary lowland rainforest on limestone ridge, leg. D.Telnov.

Variability: Measurements of selected adult shells (height x width): 2.2 x 2.3 mm; 2.4 x 2.6 mm; 2.6 x 2.6 mm. Quantity of umbilical carinae not constant and varies from 3 to 4. All studied shells are non-pubescent (see also van Benthem Jutting 1958: 310). The upper external carinae decrease in size on penultimate and body whorls.
Note: This species seems abundant in southern Misool Island. Specimens were sampled from the underside of decomposing leaves, in dense leaf litter in primary lowland rainforest at the base of a limestone hill. An additional specimen was sampled in a creek valley in lowland rainforest, from the underside of decomposing leaves on muddy ground ~200 m from the seacoast.

Ditropopsis (s. str.) ***moellendorffi*** **(O. Boettger, 1891)**
Material, 2 specimens KGC: INDONESIA E, Prov. Maluku tengah, Seram N, distr. Seram Utara, Trans-Seram road between Masohi and Sawai, Horale (former Saka) vill. ~7 km SW, river valley, 02°59'15"S, 129°02'37"E, 07.IV.2009, 300-450 m, primary lowland rainforest, leg. K.Greķe; 1 specimen KGC: INDONESIA E, Prov. Maluku tengah, Seram N, distr. Seram Utara, Trans-Seram road between Masohi and Sawai, between Makariki and Horale (former Saka) vills., ~13 km SW Horale (former Saka) vill., river valley, 03°02'57"S, 129°02'21"E, 08.IV.2009, 350-450 m, secondary lowland rainforest, leg. K.Greķe.

Ecology: Specimens of this species were found in leaf litter of primary and disturbed lowland rainforest in the central range of Seram Island.
Note: These are the first records since the original description. This species was previously known only from the locus typicus - Ambon Island of Lease Islands.

Ditropopsis (s. str.) ***perlucidula*** **(Greķe, 2011b)**
Material, 10 specimens UF: 426253 JDS-0941 Maluku Utara Province Obi Island, W shore of Danau Sagu, 8 km NNE of Kawassi -1,51723 127,4514 John Slapcinsky 2008.10.23 250 meters; 2 specimens UF: 426266 JDS-0942 Maluku Utara Province Obi Island, border of garden and rainforest 2.3 km N Woi -1,7044 127,6067 John Slapcinsky 2008.10.26 150 meters.

Note: First records since original description, det. J. Slapcinsky, 2013.

Diagnoses of new and selected insufficiently known species

Ditropopsis (s. str.) ***alta*** **sp. nov.** (Plate 15 figs 1-6, map 4)
Holotype NME: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50"S, 130°11'09"E, 350 m, 06.II.2012, primary lowland rainforest on limestone ridge, leg. D.Telnov.

Derivatio nominis: Named from Latin 'altus' [tall], because of the shell shape.
Measurements: Holotype shell height 3.5 mm, width 3.2 mm, operculum diameter 1.1 mm.
Description: Shell dull, shiny on the base, transparent; colour horny. Shell shape high conical. Whorls 5¼, first two whorls are smooth, following ones striated by dense radial lines. Shell bears three acute weak carinae: the first, peripheral, covers the suture, the second, basal, encircling the umbilical opening, the third, is hardly visible, and located within the narrow umbilical opening. Whorls are convex. Umbilicus narrow (less than 1/7 of the shell diameter). Base flat. Aperture circular, channelled at the carina. Peristome pentagonal, white, thickened and double. Operculum derivative, colour cream. Interior surface arched, formed by distinct concentric growth lines; transparent at the centre (Plate 15 fig. 4). Exterior surface with broad and short periostracal process with wide median pit (½ of the operculum diameter). This process is trapezoidal in lateral view (Plate 15 fig. 6).
Diagnosis: Most similar to *Ditropopsis pyramis* sp. nov. (Raja Ampat Islands: Misool Island; see description of this species below). *D. alta* differs by less quantity of whorls, smaller shell size and derivative operculum (simple in *D. pyramis*). *D. alta* is unique within its genus due to narrow umbilicus.
Ecology: The single known specimen of this species collected on the ground in semidry leaf litter in old growth lowland rainforest growing on a limestone ridge.
Distribution: Only known from locus typicus, central part of Misool Island (Raja Ampat Islands).

Ditropopsis (s. str.) ***halmaherica* sp. nov.** (Plate 16 figs 1-6, map 3)

Holotype MBBJ: INDONESIA E, North Moluccas, central Halmahera, creek Moreala valley E of Weda, 0°19'47"N, 127°49'57"E, 200-210 m, 06.VII.2013, primary lowland rainforest on limestone, leg. K.Greke

Paratypes 5 specimens. 1 MBBJ, 2 NME, 2 KGC: same data as in the holotype [two of them subadult and one - juvenile with slightly damaged shell]

Derivatio nominis: The name derived from locus typicus of this species, Halmahera Island.

Measurements, holotype: Shell height 1.9 mm, width 3.3 mm, operculum diameter 0.8 mm. Paratypes, selected adult shells: Height 1.6 mm, width 2.9 mm, operculum diameter 0.7 mm; height 1.8 mm, width 3.0 mm operculum diameter 0.8; height 1.9 mm, width 3.2 mm operculum diameter 0.8.

Description: Shell shiny, transparent, colour cream. Shell shape low conical, depressed, with bulging apical whorls. Whorls 4½, first two whorls pitted, following ones reticulated with rough and dense spiral lines and delicate radial striae. Shell bears two acute and strong carinae: the first is peripheral, the second - basal. One fine almost invisible carina is within the umbilicus. Suture covered by peripheral carina. Whorls are convex. Umbilicus wide (less than ½ of the shell diameter). Base rounded. Aperture circular, channelled at the carinae. Peristome quadrangular and thickened, its basal and palatal margins are distinctly broadened. Palatal margin is projecting over the columellar one. Operculum derivative; colour brown, transparent in the centre (Plate 16 fig. 4). Interior surface of operculum arched, formed by distinct concentric growth lines. Exterior side concave, with broad and very short periostracal process with median pit. This process is trapezoidal in lateral view (Plate 16 fig. 6).

Diagnosis: Most similar to *Ditropopsis obiensis* Greķe, 2011b (North Moluccas: Bisa Island), also to *D. moellendorffi* (O.Boettger, 1891) (Central Moluccas: Ambon & Seram islands). Shell is dull and brown in *D. obiensis*, but shinier, transparent and paler in colour in *D. halmaherica*; shape more depressed in *D. halmaherica*. *D. halmaherica* characterized by absence of dense spiral striation within the umbilicus (umbilicus densely spirally striate in *D. obiensis*), but presence of rough spiral lines on the top side and the base of the shell (*D. obiensis* has fine spiral striae). Also *D. halmaherica* has similar shell colour and shape to *D. moellendorffi*, but clearly differs by presence of two acute carinae (three in *D. moellendorffi*) and derivative operculum.

Ecology: This species was collected in remnants of primary lowland rainforest on a limestone ridge, in leaf litter on underside of decomposing leaves (Plate 28 fig. 4).

Distribution: Only known from locus typicus, central part of Halmahera Island (North Moluccas).

Remarks: Umbilical carinae are invisible in some specimens.

Ditropopsis (s. str.) ***ingenua* (O. Boettger, 1891)** (Plate 17 figs 1-3, map 5)

Redescription based on syntypic specimen from Ambon (SMF), consider the original description for more information.

Description: Shell shiny, transparent, colourless. Shell shape low conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls 4, first two whorls are smooth, subglobose, indistinctly tilted over obliquely to one side, covers less than 1/3 of the umbilical opening on top of the shell. Shell delicately radially striated, bearing two (in some specimens three) acute and strong carinae: the first, peripheral, partly covers the suture, the second and largest, on the base. A third very weak carina is sometimes located on the top of each whorl near the suture. Four weaker carinae are visible within the umbilicus. Suture deep. Umbilicus is wide approximately ½ of the shell diameter. Base broad. Aperture circular, channelled at external carinae. Peristome irregularly triangular, double; its basal margin is distinctly broadened, palatal one is curl. Operculum derivative; colour brown. Interior surface not visible in syntype. Exterior surface concave with very broad median tubular periostracal process, which is hollow in the middle (Plate 17 fig. 1).

Diagnosis: This species has uncommon shell shape and therefore doesn't have similar species in the Papuan region.

Note: As this redescription is based on the photographs of the syntype, no measurements were taken.

Ditropopsis (s. str.) ***magna* sp. nov.** (Plate 18 figs 1-6, map 4)

Holotype NME: INDONESIA E, Raja Ampat, Misool Island S, Biga vill. ~7,50 km W, River Biga valley, 02°01'23"S, 130°12'38"E, 45-78 m, 03.II.2012, primary lowland rainforest on limestone, at base of limestone hill, leg. D.Telnov.

Paratypes 118 specimens. 10 NME, 21 KGC: same data as in the holotype [three of these paratypes are juvenile shells]; 10 NME, 5 SMF, 36 KGC: INDONESIA E, Prov. Raja Ampat, Misool, distr. Misool Barat, Lilinta (Lelintah) vill. env., 02°02'54"S, 130°16'19"E, 01.IV.2009, secondary moist lowland forest, under fallen tree and in litter, leg. K.Greķe; 10 NME, 23 KGC: INDONESIA E, Raja Ampat, Misool Island S, Lilinta (Lelintah) vill. env., 02°02'57"S, 130°15'58"E, 6 m, 02-03.II.2012, primary lowland rainforest on limestone, creek valley, leg. D.Telnov; 3 KGC: INDONESIA E, Raja Ampat, Misool Island S, between Lilinta (Lelintah) and Biga vill., 02°02'14"S, 130°16'14"E, 20 m, 03.II.2012, primary lowland rainforest, leg. D.Telnov [one of these paratypes is juvenile shell].

Derivatio nominis: Named from Latin 'magnus' [large, big], as one of largest Ditropopsis species in the Papuan region.

Measurements, holotype: Shell height 4.6 mm, width 6.1mm, operculum diameter 1.7 mm. Selected adult paratype shells (height x width):

River Biga valley	between Lilinta & Biga	Lilinta env.
4.2 x 6.0	3.8 x 5.6	3.5 x 5.2
4.5 x 5.7		3.7 x 5.3
4.7 x 6.1		4.0 x 4.8
4.8 x 6.8		4.2 x 5.2
		4.2 x 5.4

Description: Shell dull, colour brown, apical whorl colourless. Shell shape low conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls 4¼, the first whorl is subglobose, indistinctly tilted over obliquely to one side and covers approximately 1/3 of the umbilical opening on top of the shell. Shell reticulated with dense radial lines on the top side of the shell and delicately striated by radial lines and spiral striae on the base. Shell bears three carinae, two of them acute, strong and continuous: one at the periphery and covers the suture, another on the base. The third carina is on the upper side of each whorl halfway between suture and periphery which disappears on the body whorl. Penultimate and body whorls are convex. Umbilicus wide (1/3 of the shell diameter). Base broad, slightly rounded. Aperture circular, channelled at the carinae. Peristome quadrangular, nacreous, thickened and double. Its columellar and basal margins are broadened. Palatal margin is projecting over the columellar one, slightly curved. Operculum simple; brown internally, light horny, nacreous externally; thin, not transparent at the centre (Plate 18 fig. 4). Interior surface of operculum is arched, formed by distinct concentric growth lines. Exterior surface concave.

Variability: Some paratypic shells vary in shell shape and size, also in width of peripheral carinae. Some specimens have white coloured exterior surface of operculum. Elder specimens have white coloured margin.

Diagnosis: Similar to *Ditropopsis benthemjuttingi* Greķe, 2011a (Raja Ampat: Misool Island) and *D. wallacei* sp. nov. (Raja Ampat: Waigeo Island; see description of this species below), but clearly differs by larger shell and rough sculpture (fine in both *D. benthemjuttingi* and *D. wallacei*), presence of two carinae (single in both abovementioned species), and simple operculum (operculum with long and narrow periostracal process in both *D. benthemjuttingi* and *D. wallacei*).

Ecology: This species inhabit primary lowland rainforests and been found at base of old limestone hills and in the valley of limestone creek. Specimens were sampled from underside of decomposing leaves, in dense leaf litter and on underside of fallen tree (Plate 28 fig. 3). Additional specimens sampled in creek valley from underside of decomposing leaves on muddy ground ~200 m from seacoast. Species sampled on altitudes 6, 20, 45 and 78 m.

Distribution: Only known from southern part of Misool Island (Raja Ampat Islands).

Ditropopsis (s. str.) ***majalibit* sp. nov.** (Plate 17 figs 4-6, map 3)

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Majalibit Bay, Waisai 19 km NE, River Werabiai valley, 00°18'02"S, 130°56'00"E, 40-60 m, 20.II.2012, primary lowland rainforest on limestone, leg. D.Telnov.

Paratype 1 specimen KGC: same data as in the holotype [the paratype shell is damaged].

Derivatio nominis: The name (used as noun) derived from locus typicus of this species, Majalibit Bay in Waigeo Island.

Measurements: Height 1.8 mm, width 1.9 mm, operculum diameter 0.6 mm.

Description: Shell shiny, transparent, colour pale cream, two apical whorls colourless. Shell shape conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls 4¼, first two whorls are subglobose, indistinctly tilted over obliquely to one side and covers approximately ½ of the umbilical opening on top of the shell. These first whorls are smooth, following ones striated with dense radial lines on the top side of whorls below the suture. Shell bears three acute and strong carinae: one at the periphery and covers the suture, the second encircling the umbilical opening, the third carina situated on the upper side of each whorl nearby the first one. One fine carina is visible within the umbilicus. Whorls are convex. Suture not deep. Umbilical surface reticulated by fine, almost invisible radial and spiral striae. Umbilicus is wide approximately 1/4 of the shell diameter. Base flattened. Aperture circular, channelled at external carinae. Peristome almost pentagular, slightly thickened, not fully developed. Operculum derivative; colour brown. Interior surface of operculum arched. Exterior surface concave with very broad median tubular periostracal process, which is hollow in the middle. It seems similar to opercula of Ditropopsis ingenua (O. Boettger, 1891) (Plate 17 fig. 1) and D. mirabilis Greķe, 2011a. As operculum is presented only in the holotype, I am not going to remove it.

Diagnosis: Most similar to *Ditropopsis heterospirifera* (van Benthem Jutting, 1958) (Raja Ampat: Misool Island), *D. telnovi* sp. nov., *D. waigeoensis* sp. nov. (both - Raja Ampat: Waigeo Island), as to *D. tritonensis* Greke, 2011a (W New Guinea: Bird's Neck isthmus). *D. majalibit* clearly differs by radial striation near upper suture (both *D. tritonensis* and *D. waigeoensis* are radially striated on whole surface; *D. telnovi* and *D. heterospirifera* reticulated with dense and delicate radial and spiral lines on whorls' upper surface), absence of carina between peripheral one and suture (its presence in *D. heterospirifera*, *D. telnovi*, and *D. waigeoensis*; *D. tritonensis* has discontinuous carina), partly covering the suture (fully covered in *D. telnovi*, *D. tritonensis* and *D. waigeoensis*; open in *D. heterospirifera*). From *D. telnovi* and *D. waigeoensis* differs in higher spire; from *D. heterospirifera*, *D. telnovi* and *D. waigeoensis* - in distance between peripheral and upper carinae. Shell is bigger in *D. heterospirifera* and *D. tritonensis* than in *D. majalibit*.

Ecology: This species inhabits primary lowland rainforests and has been found in karst formations at the base of old limestone cliffs not far from the sea (Plate 28 fig. 6). Specimens were sampled from dense and wet leaf litter accumulated around limestone outcrops and large trees.

Distribution: Only known from locus typicus, valley of River Werabiai in southern part of Majalibit Bay in Waigeo Island.

Ditropopsis (s. str.) ***moellendorffi*** **(O. Boettger, 1891)** (Plate 19 figs 1-6, map 5)

Redescription based on specimen from Central Seram (consider the chapter 'Additional faunal information on *Ditropopsis* species from the Papuan region' above for locality data).

Measurements: Height 1.6 mm, width 2.4 mm, operculum diameter 0.7 mm.

Description: Shell shiny, transparent, pale cream. Shell shape low conical, depressed, with bulging apical whorls. Whorls almost 4, first two whorls pitted, following ones reticulated with fine and dense radial lines and spiral striae. Shell bears three acute carinae: strongest at the periphery, second on the upper side halfway between suture and periphery, and third on the base. Suture covered by peripheral carina. Umbilicus wide (less than 1/3 of the shell diameter). Base rounded. Aperture circular, channelled at the carinae. Peristome triangular, its basal and palatal margins are distinctly broadened. Operculum simple, colour brown, transparent in the centre (Plate 19 fig. 4). Interior surface of operculum arched, formed by distinct concentric growth lines. Exterior surface concave.

Diagnosis: Similar to *Ditropopsis perlucidula* Greķe, 2011b (North Moluccas: Obira Island), but clearly differs by shell shape (discoid in *D. perlucidula*), presence of three carinae (two in *D. perlucidula*), also by simple operculum. Also similar to *D. halmaherica* sp. nov. (North Moluccas: Halmahera Island; see description and differential diagnosis of this species above).

Ecology: This species inhabit both primary and secondary lowland rainforests, found in river valleys under decomposing leaves (Plate 28 fig. 1).

Distribution: Known from Ambon Island and Seram Island (Central Moluccas).

Remarks: All specimens from Seram are constantly smaller than measurements of the holotype, which is 4.0 mm in width according to its original description.

Ditropopsis (s. str.) ***monticola*** **sp. nov.** (Plate 20 figs 1-7, map 6)

Holotype NME: INDONESIA E, West Papua, Tamarau mts, Fef vill. ~6 km E, 00°49'24"S, 132°29'48"E, 450-500 m, 12.II.2012, primary lowland rainforest on limestone, leg. D.Telnov [the holotype shell slightly damaged on the top].

Paratype 1 specimen KGC: same data as in the holotype [damaged shell with only upper part present].

Derivatio nominis: Named from Latin 'monticola' [mountaineer], because this species inhabits central part of the Tamarau Mountains.

Measurements, holotype: Shell height 3.4 mm, width 6.1 mm, operculum diameter 1.5 mm.

Description: Shell shiny, transparent, colour light brown. Shell shape low conical. Whorls 43/4, with delicate growth lines, last 1½ whorl with dense radial striae below the suture. Shell bears two acute carinae: one extraordinary wide, peripheral, covers the suture, another is on the base. Whorls weakly convex. Umbilical opening is wide (1/3 of the shell diameter). Base flattened. Aperture circular, channelled at the carina. Peristome thickened, its basal and palatal margins are curl and double. Palatal margin is projecting over the columellar one. Operculum derivative, colour brown. Interior surface of operculum arched, formed by distinct concentric growth lines; not transparent at the centre (Plate 20 fig. 5). Exterior surface thin and concave, with long median tubular periostracal process, which is hollow in the middle and widened to the top. It is formed by two concentric growth tubes. One of them is twice higher, curved to outside edge and cream coloured (Plate 28 figs. 6-7).

Diagnosis: Similar to *Ditropopsis benthemjuttingi* Greķe, 2011a (Raja Ampat Islands: Misool Island), *D. obiensis* Greķe, 2011b (North Moluccas: Bisa Island), *D. papuana* E.A. Smith, 1897 (W New Guinea: Onin Peninsula), and *D. wallacei* sp. nov. (Raja Ampat Islands: Waigeo Island; see description of this species below). *D. monticola* has generally larger shell than any of mentioned species; less convex whorls than *D. benthemjuttingi*, *D. obiensis* and *D. wallacei*, but shell less depressed than in *D. papuana*. Presence of two carinae distinguishes *D. monticola* from unicarinate *D. benthemjuttingi* and *D. wallacei*, as also from tricarinate *D. papuana*. *D. monticola* characterized by absence of dense spiral striation within the umbilical opening (umbilicus densely spirally striate in *D. benthemjuttingi*, *D. obiensis* and *D. wallacei*). Shell is dull in *D. obiensis* but shinier and transparent in *D. monticola*. Periostracal process of operculum is longer and more robust (double) in *D. monticola*, but shorter and less broad in *D. benthemjuttingi*, *D. obiensis* and *D. wallacei*; in *D. papuana*, median periostracal process is triangular according to the original description of this species & figure given by E.A. Smith (1897) (no operculum was available for this study).

Ecology: This species was collected in primary lowland rainforest with limestone outcrops surrounded by high ridges of the Tamarau Mountains at altitude 450-500 m (Plate 28 fig. 2). Specimens sampled from underside of decomposing leaves accumulated in a limestone cavity.

Distribution: Only known from locus typicus, central part of the Tamarau Mountains in central Bird's Head Peninsula, W New Guinea.

Ditropopsis (s. str.) ***pallidioperculata*** **sp. nov.** (Plate 21 figs 1-6, map 6)

Holotype NME: INDONESIA E, West Papua, Sorong 13-17 km E, 00°50'44"S, 131°22'34"E, 100-110 m, 22.II.2012, river valley, secondary lowland rainforest, leg. D.Telnov [the holotype shell slightly damaged on the top].

Paratypes 2 specimens KGC: same data as in the holotype [one of the paratypes is juvenile shell; second paratype is slightly damaged and deformed adult shell].

Derivatio nominis: The name derived from combination of Latin 'pallidus' [pale] and 'operculum', to indicate on pale operculum.

Measurements, holotype: Shell height 3.3 mm, width 4.2 mm. Operculum diameter 1.2 mm.

Description: Shell dull, shiny on the base, transparent; colour light brown. Shell shape conical. Whorls 5, first 1½ whorl is smooth, following ones with delicate growth lines, last 1½ whorl with dense radial striae. Shell bears one acute and strong peripheral carina, which covers the suture. Whorls are convex. Umbilical opening is wide (more than 1/4 of the shell diameter). Base flattened. Aperture circular, channelled at peripheral carina. Peristome slightly triangular, almost rounded, whitish, slightly thickened and double; its palatal margin is projecting toward the columellar one. Operculum derivative; cream internally, white externally. Interior surface of operculum arched, hollow in the middle, formed by distinct concentric growth lines (Plate 21 fig. 4). Exterior surface concave, with long and narrow median tubular periostracal process, which is hollow in the middle without covering on interior surface and slightly widened distally (Plate 21 figs 5-6).

Diagnosis: Similar to *Ditropopsis fultoni* E.A. Smith, 1897 (W New Guinea: Onin Peninsula) and *D. tritonensis* Greke, 2011a (W New Guinea: Bird's Neck isthmus), but clearly differs by fewer number of shell carinae and apical whorls, which are attached to the spire. *D. pallidioperculata* is also very similar to *D. tamarau* sp. nov. and *D. unicarinata* sp. nov. (both - W New Guinea: Bird's Head Peninsula) in shell shape. Unicarinate shell and presence of long tubular periostracal process of operculum separates *D. pallidioperculata* from *D. tamarau*. *D. unicarinata* have more angulate aperture, smaller and shinier shell, narrower peripheral carina and dark operculum.

Ecology: Specimens of this species were collected from decomposing leaves in secondary rainforest, on riverside (Plate 28 fig. 7) just 2 meters higher than present water level.

Distribution: Occurs in W part of Bird's Head Peninsula in West New Guinea, near Sorong.

Ditropopsis (s. str.) ***pyramis* sp. nov.** (Plate 22 figs 1-6, map 4)

Holotype NME: INDONESIA E, Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50"S, 130°11'09"E, ~200 m, 05.II.2012, primary lowland rainforest on limestone, limestone ridge, leg. D.Telnov [the holotype shell damaged on the top].

Paratypes 4 specimens RMNH [all are juvenile shells]. 1 specimen: Zoölog. Museum. Amsterdam. [printed] Ditropis fultoni (Smith) Fakal Misool, 0-75 m. hoog 7 Oct. 1948 leg. M.A. Lieftinck [handwritten, partly underlined] / Zoölogisch Museum Amsterdam 76. 10 1 ex. Ditropis (Ditropopsis) fultoni (Edg. Smith) NEW GUINEA, Fakal, Misool 0.75 m. – 7.10.1948 leg. M.A.Lieftinck [printed, partly bold] / NCB Naturalis –Leiden Cyclophoridae 40380 Ditropis fultoni Smith ZMA.MOLL.316841 [printed, partly bold]; 3 specimens: Zoölog. Museum. Amsterdam. [printed] Ditropis fultoni (Smith) Waima Misool, 0-75 m. hoog 10 Sept. 1948 leg.M.A. Lieftinck [handwritten, partly underlined] / Zoölogisch Museum Amsterdam 76. 10 3 ex. Ditropis (Ditropopsis) fultoni (Edg. Smith) NEW GUINEA, Waima, Misool 10.9.1948 -leg.M.A.Lieftinck [printed, partly bold] / NCB Naturalis – Leiden Cyclophoridae 40380 Ditropis fultoni Smith ZMA. MOLL.316843 [printed, partly bold].

Derivatio nominis: Named from Latin 'pyramis' [pyramid], because of pyramid-shaped, large shell.

Measurements: Holotype shell height 5.4 mm, width 5.5 mm, operculum diameter 1.5 mm.

Description: Shell shiny, transparent, colour light brown. Shell shape high conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls about 6, densely striated by radial lines. Shell bears three carinae, two of them acute, strong and continuous: one, peripheral, covers the suture, the second encircling the umbilical opening. The third carina is on the upper side halfway between suture and periphery which disappears after 3 whorls; on next whorls only a mark of carinae present. Whorls are convex. Umbilicus wide (1/3 of the shell diameter). Base flattened. Aperture circular, channelled at the carinae. Peristome quadrangular, nacreous, indistinctly double; its margins are broadened, palatal one is curved. Operculum simple; brown internally, white externally; not transparent at the centre (Plate 22 fig. 4). Interior surface of operculum is arched, formed by distinct concentric growth lines. Exterior surface concave.

Diagnosis: Similar to *Ditropopsis alta* sp. nov. (Raja Ampat: Misool Island). See description and differential diagnosis of this species above.

Ecology: The holotype was collected on the ground in rich and wet leaf litter in old growth lowland rainforest growing on a limestone ridge. No data available on habitat of the paratypes.

Distribution: Known from Fagen, Kasim and Gam river valleys in Misool Island (Raja Ampat Islands).

Ditropopsis (s. str.) ***tamarau* sp. nov.** (Plate 23 figs 1-7, map 6)

Holotype NME: INDONESIA E, West Papua, Tamarau mts, Bamus Bama vill. env., 00°45'19"S, 132°15'48"E, 730 m, 13-14.II.2012, primary lowland rainforest on limestone, leg. D.Telnov.

Derivatio nominis: The name derived from locus typicus of this species, the Tamarau Mountains in central Bird's Head Peninsula of New Guinea.

Measurements, holotype: Shell height 2.9 mm, width 3.7 mm. Operculum diameter 1.1 mm.

Description: Shell dull, shiny on the base, transparent, colour light horny. Shell shape conical. Whorls 5, first 1½ -2 whorls are globose and smooth, almost unsculptured, following ones reticulated with delicate radial and spiral striae. Shell bears two acute carinae: one at the periphery covers the suture, the second encircling the umbilical opening. Whorls are convex. Umbilical opening is wide (a little more than 1/3 of the shell diameter). Base flattened. Aperture circular, channelled at the carinae. Peristome quadrangular, slightly thickened, indistinctly double; its margin is broadened at the base. Operculum derivative; brown internally, white externally. Interior surface of operculum very slightly arched, almost flat; formed by distinct concentric growth lines; thin, weakly transparent at the centre (Plate 23 fig. 5). Exterior surface with broad and short periostracal process with median pit. This process is trapezoidal in lateral view (Plate 23 fig. 7).

Diagnosis: Similar to *Ditropopsis fultoni* E.A. Smith, 1897 (W New Guinea: Onin Peninsula) and *D. tritonensis* Greke, 2011a (W New Guinea: Bird's Neck isthmus), but clearly differs by fewer number of shell carinae and apical whorls, which are attached to the spire. *D. tamarau* especially similar to *D. unicarinata* sp. nov. (Raja Ampat Islands: Waigeo Island) and *D. pallidioperculata* sp. nov. (W New Guinea: Bird's Head Peninsula) in shell shape, but can be separated from both in its bicarinate shell (unicarinate both in *D. unicarinata* and *D. pallidioperculata*) and periostracal process of operculum being short and broad.

Ecology: This species was collected under decomposing leaf in primary lowland rainforest with sparse limestone outcrops (Plate 28 fig. 2).

Distribution: Only known from locus typicus, central part of the Tamarau Mountains in central Bird's Head Peninsula, W New Guinea.

Ditropopsis (s. str.) ***telnovi* sp. nov.** (Plate 24 figs 1-6, map 3)

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 10 km NWW, 00°24'46"S, 130°44'11"E, 70-200 m, 19.II.2012, primary lowland rainforest on limestone, leg. D.Telnov.

Derivatio nominis: Patronymic. This species is named in honor of my husband Dmitry Telnov, PhD, a well-known Latvian coleopterist who first collected this species and assisted me during expeditions to the Papuan region.

Measurements, holotype: Shell height 2.0 mm, width 2.6 mm, operculum diameter 0.8 mm.

Description: Shell glossy, transparent, colour cream, two apical whorls colourless. Shell shape conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls almost 4½, first two whorls are subglobose, indistinctly tilted over obliquely to one side and covers 1/5 of the umbilical opening on top of the shell. These first whorls are smooth, following ones reticulated with dense and delicate radial and spiral lines. Shell bears three acute and extraordinary broad waved carinae: one at the periphery covers the suture, the second encircling the umbilical opening, the third, largest expands rapidly on last 1½-2 whorls till 0.3 mm in the broader part, located on the upper side of each whorl halfway between suture and periphery. Two less distinct carinae are visible within the umbilical opening. Third whorl bears additional carina on its top, disappearing in the suture of the next whorl. Umbilical surface densely reticulated by spiral lines and fine radial striae. Penultimate and body whorls are almost vertical between two upper carinae. Umbilicus wide (1/4 of the shell diameter). Base flat. Aperture circular, channelled at external carinae. Peristome somehow pentagonal, slightly thickened and nacreous. Operculum derivative; pale brown, nacreous externally; thin, not transparent at the centre (Plate 24 fig. 4). Interior surface of operculum is arched, formed by distinct concentric growth lines. Exterior surface with broad and short periostracal process with median pit. This process is trapezoidal in lateral view (Plate 24 fig. 6).

Diagnosis: Most similar to *Ditropopsis waigeoensis* sp. nov. (Raja Ampat: Waigeo Island; see description of this species below). *D. telnovi* has spiral lines on the top side of the shell (absent in *D. waigeoensis*), extraordinary broad and waved carinae (not extremely broad in *D. waigeoensis*), size of umbilicus (wider in *D. waigeoensis*), presence of two continuous umbilical carinae (three in *D. waigeoensis*), sculpture of the umbilical opening, paler operculum with stronger developed periostracal process (operculum darker and periostracal process shorter in *D. waigeoensis*), shell surface is more glossy than in *D. waigeoensis*. Also similar to *D. majalibit* sp. nov. (Raja Ampat: Waigeo Island). See description and differential diagnose of this species above.

Ecology: This species was collected under decomposing leaf in primary lowland rainforest (Plate 28 fig. 5) with very rich leaf litter on very wet place.

Distribution: Only known from southern part of Waigeo Island (Raja Ampat Islands).

Ditropopsis (s. str.) ***unicarinata* sp. nov.** (Plate 25 figs 1-6, map 3)

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 10 km NWW, 00°24'46"S, 130°44'11"E, 70-200 m, 19.II.2012, primary lowland rainforest on limestone, leg. D.Telnov [the holotype shell slightly damaged on the top].

Paratypes 24 specimens [6 of them are juvenile shells]. 10 NME, 14 KGC: same data as in the holotype.

Derivatio nominis: The name derived from combination of Latin 'unus' [one, single] and 'carinatus' [carinate], because of presence of single peripheral carina on the shell.

Measurements, holotype: Shell height 2.6 mm, width 3.2 mm. Operculum diameter 1.0 mm. Selected adult paratype shells (height x width):

2.6 x 3.2
2.6 x 3.5
2.8 x 3.3
2.9 x 3.3

Description: Shell shiny, transparent; colour light brown, first 2-2½ whorls are whitish. Shell shape conical. Whorls almost 5, first 1½ whorl is globose and smooth, following ones with delicate growth lines, the last two whorls with dense radial striae below the suture. Shell bears one acute peripheral carina, which covers the suture. Whorls are convex. Umbilical opening is wide (1/4 of the shell diameter). Base flattened. Aperture circular, channelled at peripheral carina. Peristome triangular, whitish, thickened and double. Operculum derivative; brown internally, white externally. Interior surface of operculum arched, formed by distinct concentric growth lines; weakly transparent at the centre (Plate 25 fig. 4). Exterior surface concave, with long and narrow median tubular periostracal process, which is hol-

low in the middle and slightly widened distally; colour dark brown (Plate 25 fig. 6).
Variability: Some specimens have slightly developed carina encircling the umbilical opening on body whorl. Species also slightly varies in shell shape.
Diagnosis: Similar to *Ditropopsis fultoni* E.A. Smith, 1897 (W New Guinea: Onin Peninsula) and *D. tritonensis* Greke, 2011a (W New Guinea: Bird's Neck isthmus), but clearly differs by unicarinate shell with apical whorls, which are attached to the spire. Shell shape is especially similar to this in *D. tamarau* sp. nov. and *D. pallidioperculata* sp. nov. (both from Bird's Head Peninsula of W New Guinea; see descriptions above). Shell is bicarinate and operculum bears short and broad periostracal process by *D. tamarau*. Aperture is less angular in *D. pallidioperculata*, shell is larger and dull, peripheral carina is broader and operculum is pale in this species.
Ecology: This species was collected from decomposing leaves in rich leaf litter of primary lowland rainforest (Plate 28 fig. 5) on very wet places.
Distribution: Only known from southern part of Waigeo Island, found in Majalibit Bay (Raja Ampat Islands).

Ditropopsis (s. str.) ***waigeoensis* sp. nov.** (Plate 26 figs 1-6, map 3)

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 4,5 km SW, Waiwo dive resort, 00°26'07"S, 130°46'45"E, 10-15 m, 21.II.2012, primary lowland rainforest on limestone, leg. D.Telnov.
Paratypes 18 specimens. 3 NME, 4 KGC: same label as in the holotype [three of them are juvenile shells]; 3 NME, 8 KGC: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 4-6 km W (around Waisai airport), 00°24'46"S, 130°44'11"E, 10-100 m, 17.II.2012, primary lowland rainforest on limestone & karst, leg. D.Telnov [one of these paratypes is juvenile shell].

Derivatio nominis: The name derived from locus typicus of this species, Waigeo Island.
Measurements, holotype: Shell height 2.1mm, width 2.5 mm, operculum diameter 0.7 mm. Selected adult paratype shells (height x width):

1.8 x 2.5
1.95 x 2.6
2.0 x 2.7

Description: Shell shiny, transparent, colour cream, two apical whorls colourless. Shell shape conical, with apical whorls partly detached from the spire and wide umbilicus. Whorls 4½, first two whorls are subglobose, indistinctly tilted over obliquely to one side and covers ¼ of the umbilical opening on top of the shell. These first whorls are smooth, following ones striated with dense radial lines on upper side of the shell and delicately reticulated by radial lines and spiral striae on the base and lateral side. Shell bears three acute and strong carinae: one at the periphery covers the suture, the second encircling the umbilical opening, the third carina situated on the upper side of each whorl halfway between suture and periphery. Three less distinct carinae are visible within the umbilical opening. Third whorl bears additional carina on its top, disappearing in the suture of the next whorl. Umbilical surface densely striate by distinct, but very fine irregular radial ridges. Two and half last whorls are almost vertical between two upper carinae. Umbilicus wide (more than 1/3 of the shell diameter). Base flat. Aperture circular, channelled at external carinae. Peristome quadrangular, nacreous, slightly thickened, double. Operculum derivative; brown internally, light horny, nacreous externally; thin, not transparent at the centre (Plate 26 fig. 4). Interior surface of operculum is arched, formed by distinct concentric growth lines. Exterior surface with broad and short periostracal process with median pit. This process is trapezoidal in lateral view (Plate 26 fig. 6)
Variability: Some paratypic shells are generally darker, width of umbilical carinae varies, roughness of radial lines on the top side of the shell varies too as also as shell's height. Whorl quantity varies from 4¼ to 4½.
Diagnosis: Most similar to *Ditropopsis telnovi* sp. nov. and to *D. majalibit* sp. nov. (both - Raja Ampat: Waigeo Island). See descriptions and differential diagnoses of these species above.
Ecology: This species inhabit primary lowland rainforests and been found in karst formations at base of old limestone cliffs not far from the sea. Specimens were sampled from dense and wet leaf litter accumulated around limestone outcrops and large trees. Specimens sat on underside of decomposing leaves. Species sampled at altitudes 10-100 m.
Distribution: Only known from southern part of Waigeo Island (Raja Ampat Islands).

Ditropopsis (s. str.) ***wallacei* sp. nov.** (Plate 27 figs 1-6, map 3)

Holotype NME: INDONESIA E, Raja Ampat, Waigeo Island, Majalibit Bay, Waisai 19 km NE, River Werabiai valley, 00°18'02"S, 130°56'00"E, 40-60 m, 20.II.2012, primary lowland rainforest on limestone, leg. D.Telnov [the holotype shell slightly damaged on the top].

Paratypes 23 specimens KGC: same data as in the holotype.

Derivatio nominis: Patronymic. This species is named after † Alfred Russel Wallace, the first naturalist visited Majalibit Bay on Waigeo Island, and in order to commemorate 100th anniversary of his death.

Measurements: Holotype shell height 3.0 mm, width 3.9 mm, operculum diameter 1.3 mm. Selected adult paratype shells (height x width):

2,6 x 3,7
2.8 x 3.7
2.9 x 3.8
2.9 x 3.9

Description: Shell shiny, transparent, colour brown, first two whorls paler. Shell shape low conical. Whorls almost 4, first 1-1½ whorl is smooth, following ones striated by dense radial lines. Shell bears one acute and strong peripheral carina, which covers the suture. Whorls are convex. Umbilicus wide (less than 1/3 of the shell diameter). Base almost rounded. Aperture circular, channelled at the carina. Peristome almost round, white, thickened, double. Operculum derivative; light brown internally, white externally. Interior surface of operculum arched, formed by distinct concentric growth lines; transparent at the centre (Plate 27 fig. 4). Exterior surface concave, with long and narrow median tubular non-pubescent, distally widened periostracal process, which is hollow in the middle (Plate 28 fig. 6).

Variability: Some paratypic shells are lighter in colour, as slightly different in shell size and shape.

Diagnosis: Extremely similar to *Ditropopsis benthemjuttingi* Greķe, 2011a (Raja Ampat: Misool Island), but differs in slightly higher and thicker shell with more distinct striation. Shell base less rounded, slightly angular. Peristome thicker, carina narrow and adherent to the suture, begins from the third whorl (in *D. benthemjuttingi* carina is broad, begins from the second whorl, only partly covering the suture). Carina is punctured in *D. wallacei*, but spirally striated in *D. benthemjuttingi*. Also similar to *D. obiensis* Greķe, 2011b (North Moluccas: Bisa Island), but differs in higher spire, unicarinate shell (bicarinate in *D. obiensis*) and in structure of operculum (with long tubular process in *D. wallacei*, short and broad in *D. obiensis*). Shell is dull in *D. obiensis*, but more shiny and transparent in *D. wallacei*.

Ecology: Specimens of this species collected in old growth lowland rainforest on limestone (Plate 28 fig. 6), found on the ground in leaf litter on a very wet place.

Distribution: Only known from locus typicus, valley of River Werabiai in southern part of Majalibit Bay in Waigeo Island.

Annotated checklist of *Ditropopsis* from the Papuan region

Ditropopsis E.A. Smith, 1897
Subgenus ***Ditropopsis*** s. str. E.A. Smith, 1897
Type of genus: *Ditropopsis papuana* E.A. Smith, 1897 [original designation]
= *Diaspira* Soós, 1911 [synonymy proposed by Greķe 2011a]
Type of genus: *Diaspira biroi* Soós, 1911 [monotypy]

Ditropopsis aenigmatica (van Benthem Jutting, 1963)
References: van Benthem Jutting (1963: 680), as *Ditropis aenigmatica*; Greķe (2011a: 74, map 1); Greķe (2011b: 166).
Distribution: Cenderawasih Bay: Biak Island (Map 6).

Ditropopsis alta sp. nov.
Distribution: Raja Ampat Islands: Misool Island.

Ditropopsis benthemjuttingi Greķe, 2011a
References: Greķe (2011a: 70, 73-74, plate 19 figs 1-5); Greķe (2011b: 165).
Distribution: Raja Ampat Islands: Misool Island (Map 2).

Ditropopsis biroi (Soós, 1911)
References: Soós (1911: 346), as *Diaspira Birói*; Leschke (1912a: 144), as *Diaspira biroi*; (1912b: 73), as *Diaspira biroi*; Thiele (1929: 97), as *Ditropis* (? subgen. *Diaspira*) *biroi*; van Benthem Jutting (1963: 679), as *Ditropis biroi*; Wiktor (1998: 9), as *Ditropis biroi*; Greķe (2011a: 70, 73-74), new synonymy for *Diaspira*; Greķe (2011b: 165).
Distribution: Papua New Guinea: Madang Province (Map 7).

Ditropopsis fultoni E.A. Smith, 1897
References: E.A. Smith (1897: 417), as *Ditropopsis* (?) *Fultoni*; Kobelt & Moellendorff (1899: 132), as *Ditropis (Ditropopsis) fultoni*; Kobelt (1902: 79), as *Ditropis (Ditropopsis) fultoni*; Zilch (1955: 195), as *Ditropis (Ditropisena) fultoni*; van Benthem Jutting (1958: 308), as *Ditropis fultoni*; (1963: 679), as *Ditropis fultoni*; Greķe (2011a: 71, plate 9 fig. 1, plate 11, figs 1-6, map 1); Greķe (2011b: 166).
Distribution: Indonesian New Guinea: Onin Peninsula (Map 6).

Note: Records from Misool (van Benthem Jutting 1958; 1963) and the northern coast of New Guinea (van Benthem Jutting 1963) are based on misidentified specimens of *D. pyramis* sp. nov. (Misool Island) and on undescribed species (northern New Guinea). Poor condition of the single specimen from northern New Guinea prevent it from being described.

Ditropopsis halmaherica sp. nov.
Distribution: North Moluccas: Halmahera Island.

Ditropopsis heterospirifera (van Benthem Jutting, 1958)
References: van Benthem Jutting (1958: 309), as *Ditropis heterospirifera*; (1963: 680), as *Ditropis heterospirifera*; Greķe (2011a: 71, 73-74, plate 12 figs 1-6, map 1); Greķe (2011b: 166).
Distribution: Raja Ampat Islands: Misool Island (Map 2).
Note: This species was incorrectly listed for River Biga valley by Greķe (2011a: 71), but in fact mentioned specimens were collected in the valley of River Gam.

Ditropopsis ingenua (O. Boettger, 1891)
References: O.Boettger (1891: 292), as *Ditropis ingenua*; Kobelt (1902: 75), as *Ditropis* s. str. *ingenua*; van Benthem Jutting (1953: 285), as *Ditropis ingenua*; Zilch (1955: 193), as *Ditropis* s. str. *ingenua*; Strack (1993: 51, 52); Greķe (2011a: 74); Greķe (2011b: 166).
Distribution: Central Moluccas, Lease Islands: Ambon Island (Map 5).

Ditropopsis magna sp. nov.
Distribution: Raja Ampat Islands: Misool Island.

Ditropopsis majalibit sp. nov.
Distribution: Raja Ampat Islands: Waigeo Island.

Ditropopsis mirabilis Greķe, 2011a
References: Greķe (2011a: 70-74, plate 13 figs 1-7, map 1); Greķe (2011b: 165).
Distribution: Indonesian New Guinea: Onin Peninsula (Map 6).

Ditropopsis moellendorffi (O. Boettger, 1891)
References: O.Boettger (1891: 292), as *Ditropis moellendorffi*; Kobelt (1902: 76), as *Ditropis* s. str. *Moellendorffi*; van Benthem Jutting (1953: 285), as *Ditropis moellendorffi*; Zilch (1955: 194), as *Ditropis* s. str. *moellendorffi*; Greķe (2011a: 73-74); Greķe (2011b: 165).
Distribution: Central Moluccas: Seram Island, Lease Islands: Ambon Island.

Ditropopsis monticola sp. nov.
Distribution: Indonesian New Guinea: central Bird's Head Peninsula, the Tamarau Mountains.

Ditropopsis obiensis Greķe, 2011b
References: Greķe (2011b: 161, 165, figs 1-6, map 1).
Distribution: North Moluccas, Obi Islands: Bisa Island (Map 4).

Ditropopsis pallidioperculata sp. nov.
Distribution: Indonesian New Guinea: western Bird's Head Peninsula, Sorong area.

Ditropopsis papuana E.A. Smith, 1897
References: E.A. Smith (1897: 416); Kobelt & Moellendorff (1899: 132), as *Ditropis (Ditropopsis) papuana*; Kobelt (1902: 79), as *Ditropis (Ditropopsis) papuana*; van Benthem Jutting (1963: 680), as *Ditropis papuana*; Greķe (2011a: 70-74, plate 9 fig 2), unnecessary designated as the type species for genus *Ditropopsis* E.A. Smith, 1897; Greķe (2011b: 165 & 165 footnote 1).
Distribution: Indonesian New Guinea: Onin Peninsula (Map 6).

Ditropopsis perlucidula Greķe, 2011b
References: Greķe (2011b: 164-165, figs 7-10, map 1).
Distribution: North Moluccas, Obi Islands: Obira Island (Map 4).

Ditropopsis pyramis sp. nov.
Distribution: Raja Ampat Islands: Misool Island.

Ditropopsis spiralis (O. Boettger, 1891)
References: O.Boettger (1891: 293), as *Ditropis spiralis*; Kobelt (1902: 78), as *Ditropis* s. str. *spiralis*; van Benthem Jutting (1953: 285), as *Ditropis spiralis*; Zilch (1955: 194), as *Ditropis* s. str. *spiralis*; Greķe (2011a: 73-74); Greķe (2011b: 165).
Distribution: Central Moluccas, Lease Islands: Haruku (Map 5).

Ditropopsis tamarau sp. nov.
Distribution: Indonesian New Guinea: central Bird's Head Peninsula, the Tamarau Mountains.

Ditropopsis telnovi sp. nov.
Distribution: Raja Ampat Islands: Waigeo Island.

Ditropopsis tritonensis Greķe, 2011a
References: Greķe (2011a: 72, 74, plate 14 figs 1-8, map 1); Greķe (2011b: 166).
Distribution: Indonesian New Guinea: southern Bird's Neck isthmus, Triton Bay (Map 6).

Ditropopsis unicarinata sp. nov.
Distribution: Raja Ampat Islands: Waigeo Island.

Ditropopsis waigeoensis sp. nov.
Distribution: Raja Ampat Islands: Waigeo Island.

Ditropopsis wallacei sp. nov.
Distribution: Raja Ampat Islands: Waigeo Island.

Ditropopsis sp.1
References: van Benthem Jutting (1963: 679), as *Ditropis fultoni* [misidentification]; Greķe (2011a: 71, 74) [citing previous author].
Distribution: Northern New Guinea: between Jayapura and River Mamberamo mouth (Map 7).
Note: Condition of single specimen at RMNH is not good enough to provide description.

Ditropopsis sp.2
Distribution: Papua New Guinea: West Sepik Province (Map 7).
Note: Condition of specimens at UF is not good enough to provide adequate description, as opercula are missing.

Updated identification key to *Ditropopsis* species from the Papuan region

1 Shell cornucopia-like with whorls (except 1½-2 embryonic ones) more of less distinctly free .... 2 (*mirabilis* group)
- Shell not cornucopia-like, whorls connected one with another along suture (in some species, a gap is presented between the embryonic whorls and the rest of spire) 4
2 Shell high conical, penultimate and body whorls diverging by about 30°; non-embryonic whorls with totally 3 spiral carinae; operculum externally with median tubular process which is not pubescent .... *D. mirabilis*
- Shell low conical, penultimate and body whorls diverging by much less than 30°, often almost subparallel; non-embryonic whorls with 3-4 spiral carinae; operculum externally with median tubular process, which is pubescent or not pubescent 3
3 Shell whorls with totally 4, rarely 3 spiral carinae; operculum externally with bristle of long hairs covering the median tubular process from outside .... *D. biroi*
- Shell whorls with totally 3 spiral carinae; operculum not pubescent externally [this character was not controlled by me] .... *D. spiralis*
4 Shell apical whorls partly detached from the spire (a gap is presented between the embryonic whorls and the rest of spire) 5
- Shell apical whorls are not detached from the spire (a gap is presented between the embryonic whorls and the rest of spire) 14
5 One of three largest species in the region (about 5.4 x 5.5 mm). Shell high conical, has three external carinae: two continuous , third presented on first three whorls, but atrophied to a mark on forthcoming whorls; operculum simple, white and not nacreous externally .... *D. pyramis* sp. nov.
- Shell smaller (except D. magna), shape broader. Other characters not meet together 6
6 Umbilicus is wide approximately ½ of the shell diameter; shell transparent, colourless; whorls 4; shell has 2 or 3 external and four umbilical carinae .... *D. ingenua*
- Umbilicus narrower; shell coloured; whorls more than 4 7
7 One of three largest species in the region (3.5-4.8 x 4.8-6.8 mm). Shell low conical, has three external carinae: two continuous , third disappears on the last whorl; operculum simple, white nacreous externally .... *D. magna*
- Shell generally smaller; operculum derivative or simple, not white nacreous externally 8
8 Shell low conical, rather small (about 1.6 x 2.5 mm), has 3-4 external and 3-4 umbilical carinae . *D. aenigmatica*
- Shell shape higher 9
9 Shell additionally to 2 external carinae has intermediary carina, which located on the upper side of each whorl halfway between suture and periphery, become weak on next whorls till disappears on penultimate and body whorls ... . 10 (*fultoni* group)
- Shell without or with discontinuous carina on the third whorl, which disappears in suture 11
10 Shell without umbilical carina; operculum simple .... *D. fultoni*
- Shell with umbilical carina, operculum derivative .... *D. tritonensis*
11 Shell base with rough spiral striation; suture open, not covered by carina; operculum simple . *D. heterospirifera*
- Shell base without rough spiral striation; suture covered or partly covered by carina 12

12 Whorls 4¼, first 2 cover approximately ½ of the umbilical opening, shell with radial striation near upper suture. Distance between peripheral and upper carinae relatively small. Umbilical surface reticulated by fine radial and spiral striae, has single umbilical carina. Suture partly covered .... *D. majalibit*
- Whorls about 5, first 2 whorls cover ¼ or less of the umbilical opening. Shell with 3 external and 2 or 3 umbilical carinae. Suture covered .... 13 (*telnovi* group)
13 Shell glossy, with extraordinary broad (~0.3 mm) and waved 3 external carinae, and 2 indistinct constant umbilical carinae; top side of the shell with fine spiral lines; umbilical surface reticulated. Umbilicus is ¼ of the shell diameter .... *D. telnovi*
- Shell shiny, with 3 external and 3 not distinct umbilical carinae, with rough shell sculpture; top side of the shell without spiral lines; umbilical surface without reticulation. Umbilicus is more than 1/3 of the shell diameter .... *D. waigeoensis*
14 Shell high conical, higher than wide, with apical whorls, which are not detached from the spire. Umbilicus very narrow (less than 1/7 of the shell diameter). Shell with two weak external carinae .... *D. alta*
- Shell shape different, less high, umbilicus comparatively wider 15
15 Shell discoid; has two external carinae. Exterior surface of operculum converged toward centre; with median hollow .... *D. perlucidula*
- Shell conical or low conical (not discoid); has up to 3 carinae. Exterior surface of operculum not converged toward centre 16
16 One of three largest species in the region (3.4 x 6.1 mm). Shell low conical, has two external carinae. Whorls weakly convex .... *D. monticola*
- Shell smaller. Other characters not meet together 17
17 Shell bicolour, depressed, and low conical; has 2 external and single umbilical carina. Umbilicus wide (more than 1/3 of the shell diameter) .... *D. papuana*
- Shell unicolour, shape various, from low conical to conical; has up to 3 external, but lack umbilical carinae. Umbilicus same wide or narrower 18
18 Shell depressed, low conical, with bulging apical whorls, has 2 or 3 external carinae ... 19 (moellendorffi group)
- Shell not depressed, whorls are convex, apex different, has 1 or 2 external carinae 20
19 Shell has 3 external carinae. Operculum simple........ *D. moellendorffi*
- Shell has 2 external carinae. Operculum derivative........ *D. halmaherica*
20 Shell low conical. Peristome almost round .... 21 (*benthemjuttingi* group)
- Shell conical. Peristome triangular or quadrangular .... 22 (*tamarau* group)
21 Shell shiny and transparent with almost invisible striation; has single broad and spirally striated external carina, which begins from the second whorl. Suture partly covered. Whorls 5 .... *D. benthemjuttingi*
- Shell shiny and transparent with more distinct striation; has single and punctured external carina, which begins from the third whorl. Whorls 4 .... *D. wallacei*
- Shell dull, reticulated with rough striation; has two impunctured external carinae. Whorls 5 .... *D. obiensis*
22 Shell has two external carinae .... *D. tamarau*
- Shell with single external carina 23
23 Shell shiny. Operculum brown internally .... *D. unicarinata*
- Shell larger, dull. External carina is broader. Operculum pale internally .... *D. pallidioperculata*

Biogeographic patterns and endemism in the Papuan *Ditropopsis*

Twenty seven *Ditropopsis* species (of them 25 named and 2 undescribed) are now known from the Papuan region. The genus seems to be abundant on all insular systems in the western part of the biogeographical region (The Moluccas, Raja Ampat and Cenderawasih Bay Islands), but no species are hitherto known from archipelagos east of New Guinea (Bismarck Archipelago, Louisiade and Solomon Islands etc.), but these are very few recent publications on soil (micro)malacofauna in these regions. None of the Papuan *Ditropopsis* species are shared with neighbouring areas of the Oriental or Australian region. Consequently, 100% of Papuan *Ditropopsis* species are considered endemics to the biogeographical unit. Moreover, 96% of the presently known Papuan *Ditropopsis* species are classified as local endemics (maximum distance between localities 11-70 km) (Hamer, Slotow 2002). Only one species (4%), *D. moellendorffi* (O. Boettger, 1891) is classified as a regional endemic (maximum distance between localities 71-150 km).

Generally, the distribution of 96% known species is restricted to single small island or single geographic element - montane ridge, peninsula etc. (Tab. 1)

Table 1. Diversity and rate of endemism in *Ditropopsis* species from the Papuan region.

Island group	**Island / part of an island**	**Species registered**	**Rate of endemism**
North Moluccas (region)		3	100%
	Bisa	1	100%
	Halmahera	1	100%
	Obira	1	100%
Central Moluccas (region)		4	100%
	Ambon	2	50%
	Haruku	1	100%
	Seram	1	0%
New Guinea (region)		10	100%
	Bird's Head Peninsula (lowlands)	1	100%
	Bird's Head Peninsula (Tamarau Mts.)	2	100%
	Bird's Neck isthmus	1	100%
	Northern New Guinea	2	both species not described
	Onin Peninsula	3	100%
	Eastern Papua New Guinea	1	100%
Cenderawasih Bay Islands	Biak	1	100%
Raja Ampat Islands (region)		10	100%
	Misool	5	100%
	Waigeo	5	100%

In tropical regions with high mountains (for example, New Guinea and Seram), changes in the vegetation along an altitudinal gradient are clear (Humboldt, in Hauff 1874). The fauna also changes significantly with altitude. I have analysed *Ditropopsis* species diversity at different altitudes and in diverse altitudinal vegetation zones. Such an assessment has not been performed before for the Papuan non-marine malacofauna. Thus, for a final analysis, the amount of available data is not yet sufficient. However, some general considerations are possible.

All species of *Ditropopsis* from the Papuan region are known from the lowland rainforest zone 0-700 m, with 200 m zone overlap) except for *D. tamarau* sp. nov. which has been recorded within the transition zone between lowland and lower montane (701-1800 m, with 200 m zone overlap) zones, at an altitude of 730 m. It is a bit surprisingly that the rate of endemism in both lowland and lower montane zones is so high (up to 100% for most of islands or their geological parts) for almost all *Ditropopsis* species and their collecting sites.

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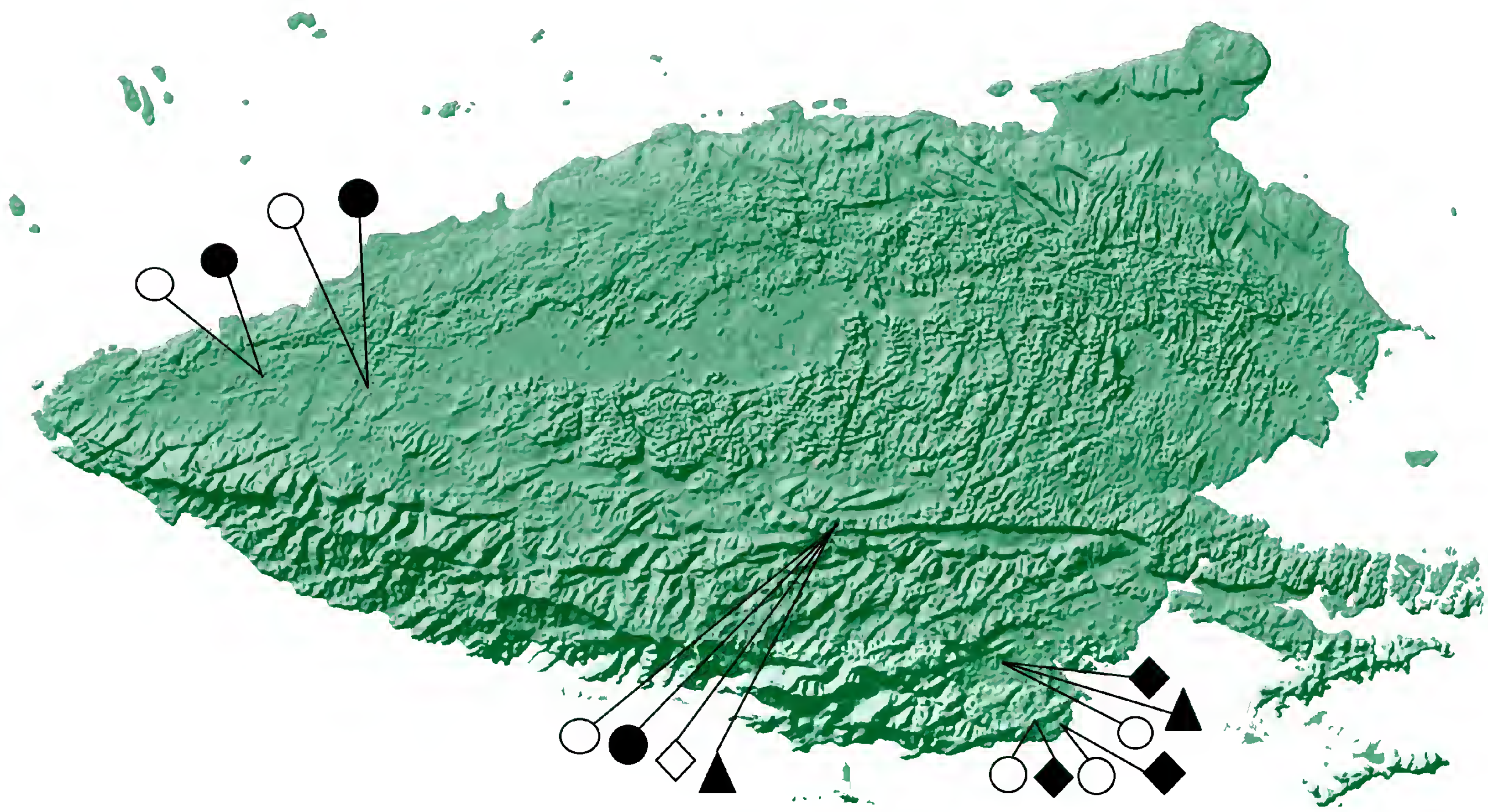
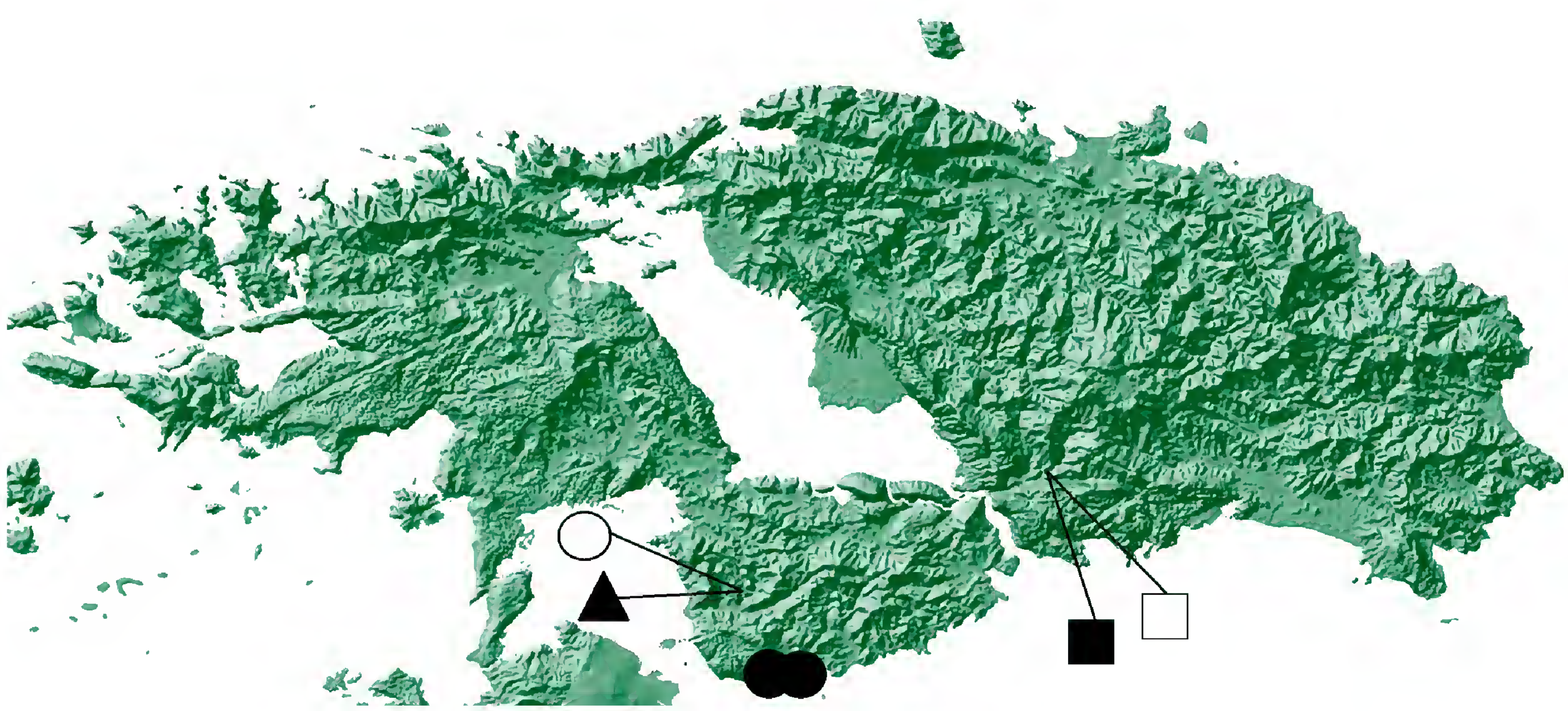


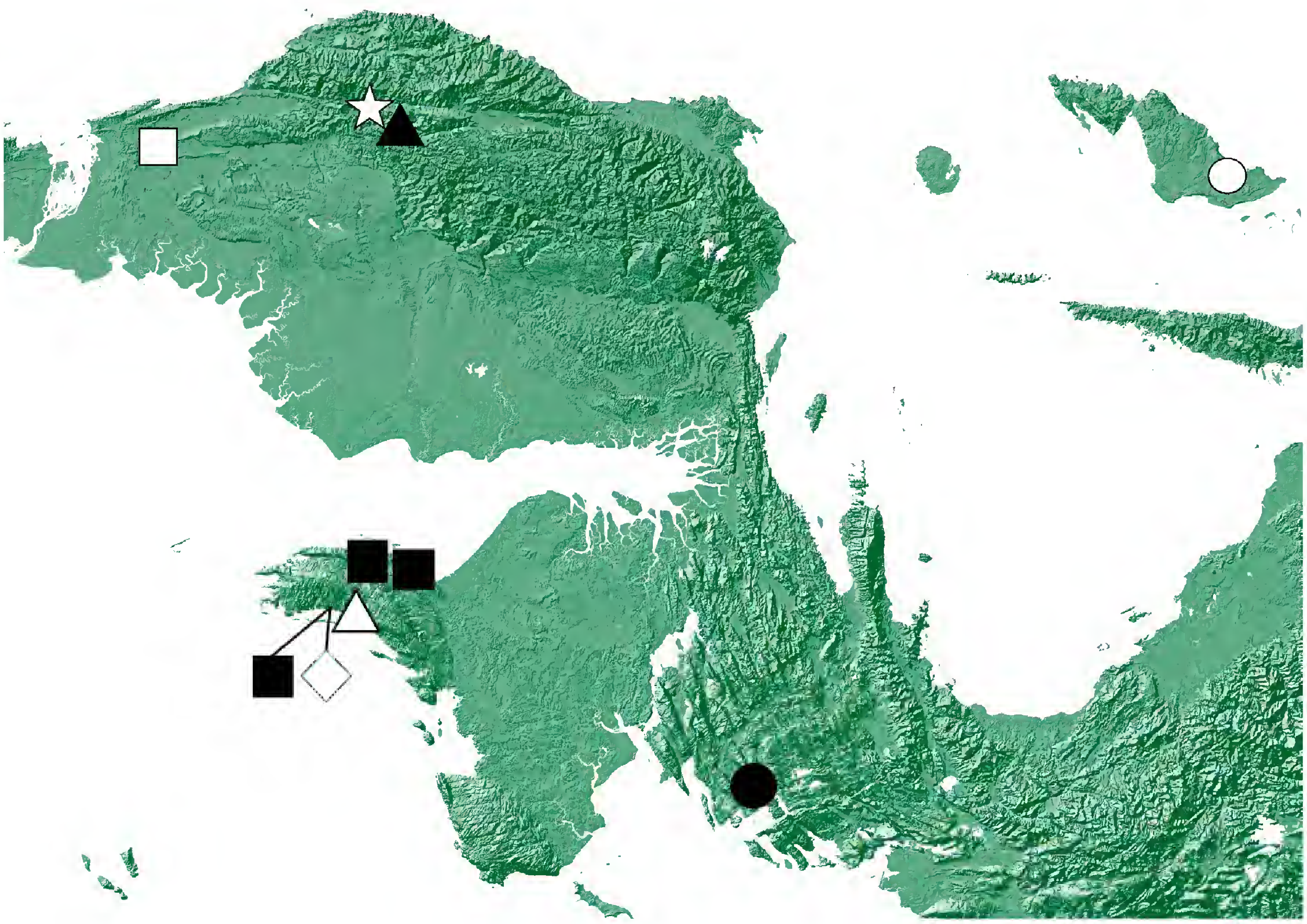
Map 2. Records of *Ditropopsis* species on Misool Island. Circle – *D. heterospirifera* (van Benthem Jutting 1958); filled circle – *D. pyramis* sp. nov.; rhomb – *D. alta* sp. nov.; filled rhomb – *D. magna* sp. nov.; filled triangle – *D. benthemjuttingi* Greķe, 2011a (prepared with Arc View 9.0).



Map 3. Records of *Ditropopsis* species on Waigeo Island. Circle – *D. unicarinata* sp. nov.; filled circle – *D. waigeoensis* sp. nov.; filled triangle – *D. telnovi* sp. nov.; square – *D. majalibit* sp. nov.; filled square – *D. wallacei* sp. nov. (prepared with Arc View 9.0).

Map 4. Records of *Ditropopsis* species from North Moluccas. Square – *D. halmaherica* sp. nov.; circle – *D. obiensis* Greķe, 2011b; filled circle – *D. perlucidula* Greķe, 2011b (prepared with Arc View 9.0).

Map 5. Records of *Ditropopsis* species from Central Moluccas. Square – *D. spiralis* (O. Boettger, 1891); circle – *D. moellendorffi* (O. Boettger, 1891); filled circle – *D. ingenua* (O. Boettger, 1891) (prepared with Arc View 9.0).



Map 6. Records of *Ditropopsis* species from West New Guinea. Square – *D. pallidioperculata* sp. nov.; filled square – *D. fultoni* (E.A. Smith, 1897); circle – *D. aenigmatica* (van Benthem Jutting, 1963); filled circle – *D. tritonensis* Greķe, 2011a; rhomb – *D. papuana* (E.A. Smith, 1897); triangle – *D. mirabilis* Greķe, 2011a; filled triangle – *D. monticola* sp. nov.; star – *D. tamarau* sp. nov. (prepared with Arc View 9.0).

Map 7. Records of *Ditropopsis* species from northern New Guinea. Circle – *D. biroi* (Soós, 1911); filled circle – *D.* sp.1; questionmark – *D.* sp.2 (prepared with Arc View 9.0).

Contribution to the genus *Orphinus* Motschulsky, 1858 from New Guinea (Coleoptera: Dermestidae: Megatominae)

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Abstract: Two new species of Dermestidae are described, illustrated and compared: *Orphinus wau* sp. nov. and *Orphinus newirelandicus* sp. nov., both new species belong to the nominotypical subgenus.

Key words: Coleoptera, Dermestidae, *Orphinus*, New Guinea, taxonomy, new species.

Introduction

The presented article follows of my preceding paper about Dermestidae from New Guinea (Háva 2011; Gressitt & Hornabrook 1985) not mentioned genus *Orphinus* Motschulsky, 1858 from New Guinea. In the present article is summarized species belonged to the genus *Orphinus* known from New Guinea, with descriptions of two new species.

Material and Methods

The following measurements were made: Total length (TL) – linear distance from anterior margin of pronotum to apex of elytra. Elytral width (EW) – maximum linear transverse distance.

Abbreviations:

JHAC – Private Entomological Laboratory & Collection, Únětice u Prahy, Prague-West, Czech Republic.

Taxonomical part

Genus ***Orphinus*** **Motschulsky, 1858**
Subgenus ***Orphinus*** **s. str.**

Orphinus biroi **Pic, 1956**
Type locality: New Guinea, Erima, Astrolabe Bay.
Material examined: 1♀ JHAC, Nieuw Guinea, Tami river, Hollandia 1930.
Distribution: Species known only from Papua New Guinea.

Orphinus fasciatus **(Matsumura, Yokoyama, 1928)**
Material examined: 1♀ JHAC, N Guinea, Friedrich-Wilh.-hafen, 1901.
Distribution: Species known from Japan, Philippines (Luzon), Taiwan, Papua New Guinea.

Orphinus newirelandicus **sp. nov.** (Figs 1-4)
Holotype ♀ JHAC, PNG, New Ireland Pr., Hans Meyer Range, 60 km SE Namatanai, Hirudan Riv., 04°00'41"S 152°50'79"E, 9.iii.2000, A. Weigel lgt.
Type specimen labelled with red, printed labels bearing the text as follows: HOLOTYPE *Orphinus (O.) newirelandicus* sp. nov. J. Háva det. 2012.

Derivatio nominis: Named according to the type locality.
Description: Female. Body black and reddish on dorsal surfaces, black on ventral surfaces; generally large and oval. Body TL 3.05 mm, EW 1.78 mm. Head finely punctate with long yellow pubescence. Palpi brown; pubescence on mentum denser. Eye very large with brown setae. Ocellus on front present. Antennae brown with yellow setae, 11-segmented, antennal club 2-segmented, terminal antennal segment small, circular (Fig. 2). Pronotum black discaly, reddish on lateral parts; on the disc punctate like head,

densely foveolate posteriorly, with long yellow, recumbent pubescence. Scutellum triangular without pubescence. Elytra finely punctate with long yellow, recumbent pubescence on reddish fasciae; other part of cuticle black covered by short, black pubescence (Fig. 1). Legs brown with yellow pubescence. Mesosternum coarsely punctate laterally, otherwise finely punctate, covered by yellow, long, recumbent pubescence. Abdominal sternites with long, recumbent, yellow pubescence, 10th sternite as in Fig. 3. Female genitalia (Fig. 4).

Sexual dimorphism: Male is unknown.

Differential diagnosis: The new species differs from all known species by the characteristic elytral fasciae and structure of antennae, from Guinean species differs by the following characters:

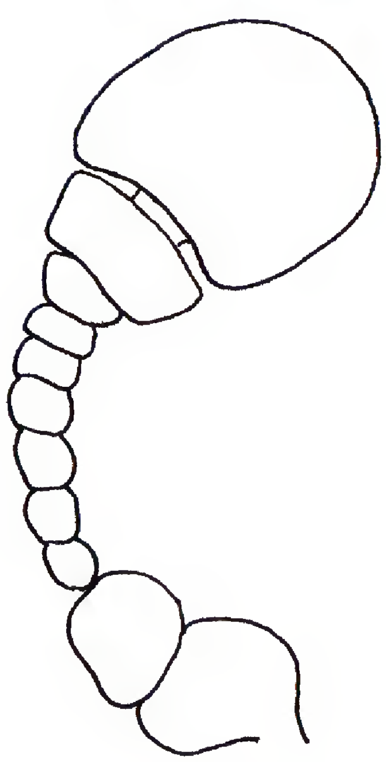
1 Each elytron with one anterior, transverse fasciae (Fig. 1) .... *O. newirelandicus* sp. nov.
– Each elytron with one transverse fasciae and apical spot 2
2 Apical spot very large, transverse fasciae broad .... *O. biroi*
– Apical spot small, transverse fasciae narrow .... *O. fasciatus*

***Orphinus testaceipes* (Pic, 1915)**

Type locality: New Guinea, Stephansort, Astrolabe Bay.

Type material: Holotype ♂ MNHN, Stephansort,

1



2

3

4

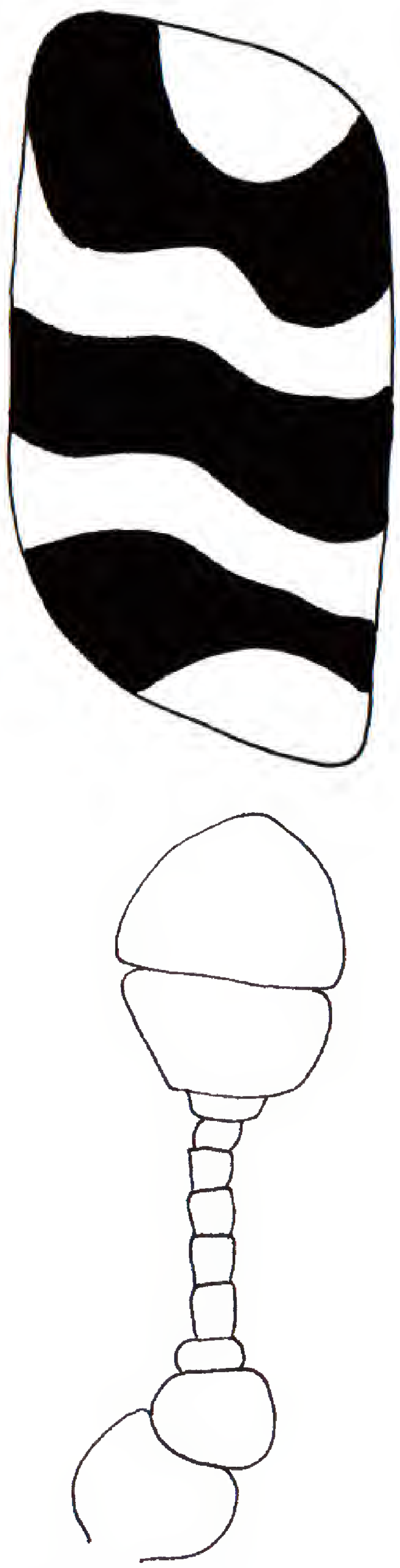
Figures 1-4. *Orphinus newirelandicus* sp. nov., holotype ♀. 1 – Left elytron; 2 – Left antenna; 3 – Sternite 10; 4 – Female genitalia.

Astrolabe B., D.N. Guinea, (Kunzmann 1894) [printed label] / Type [small, yellowish, handwritten label] / Thaumaglossa testaceipes Pic [handwritten label] / Orphinus probabl [handwritten label].
Additional material studied: 1♀ JHAC, N Guinea, Stephansort, Astrolabe Bay, 1900.
Distribution: Species known only from Papua New Guinea.

Orphinus wau **sp. nov.** (Figs 5-6)
Holotype ♀ JHAC, Papua New Guinea, Wau, 4000 ft., 24-30.vi.1974. Type specimen was labelled with red, printed labels bearing the text as follows: HOLOTYPE *Orphinus (O.) wau* sp. nov. J. Háva det. 2012.

5

6



Figures 5-6. *Orphinus wau* sp. nov., holotype ♀. 5 – Left elytron; 6 – Left antenna.

Derivatio nominis: Named according to the type locality.
Description: Female. Body black on dorsal and ventral surfaces; generally small and oval. Body TL 2.93 mm, EW 1.60 mm. Head coarsely punctate with long whitish-grey pubescence. Palpi brown; pubescence on mentum denser. Eye very large with brown setae. Ocellus on front present. Antennae dark brown with brown setae, 11-segmented, antennal club 2-segmented, terminal antennal segment small, circular (Fig. 6). Pronotum on the disc punctate like head, densely foveolate posteriorly, with long whitish-grey, erected pubescence. Scutellum triangular without whitish-grey pubescence. Elytra finely punctate with long white and brown, erected pubescence; cuticle black; each elytrown with four fasciae from whitish-grey pubescence (Fig. 5). Legs brown with short, white pubescence. Mesosternum coarsely punctate laterally, otherwise finely punctate, covered by whitish-grey, short, recumbent pubescence. Abdominal sternites with short, recumbent, whitish-grey pubescence.
Sexual dimorphism: Male is unknown.
Differential diagnosis: The new species is very similar to *O. subfasciatus* Pic, 1927 (the Philippines: Mindanao) but differs from it by the following characters:

1 Antennae yellowish-brown; elytral pubescence recumbent; three elytral transverse fasciae from grey pubescence narrow .... *O. subfasciatus*
– Antennae dark brown; elytral pubescence erected and rucumbent; four elytral fasciae from whitish-grey pubescence erected and broad .... *O. wau* sp. nov.

List of *Orphinus* Motschulsky, 1858 species from New Guinea

Orphinus biroi Pic, 1956
= *Orphinus biroi* var. *seminotatus* Pic, 1956
Distribution: Papua New Guinea.

Orphinus fasciatus (Matsumura, Yokoyama, 1928)
= *Orphinus rufopictus* Kalík [unpublished name]: Háva, in Háva et Votruba, 2005
Distribution: Japan, the Philippines (Luzon), Taiwan, Papua New Guinea.

Orphinus fulvipes (Guérin-Méneville, 1838)
= *Attagenus* [?] *defectus* Walker, 1858
= *Trogoderma brasiliensis* Reitter, 1881
= *Cryptorhopalum brevicorne* Sharp, in Blackburn et Sharp, 1885
= *Trogoderma unicolor* Kolbe, 1910
= *Orphinus ruficollis* Kalík, 1955
Distribution: Cosmopolitan species.

Orphinus newirelandicus sp. nov.
Distribution: Papua New Guinea (described in this publication).

Orphinus testaceipes (Pic, 1915)
Distribution: Papua New Guinea.

Orphinus wau sp. nov.
Distribution: Papua New Guinea (described in this publication).

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New species of *Aphanisticus* Latreille, 1810 (Coleoptera: Buprestidae) from Sulawesi, Indonesia and from Australia

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Abstract: *Aphanisticus barclayi* sp. nov., *Aphanisticus sulawesicus* sp. nov. from Sulawesi (Indonesia), and *Aphanisticus australasiae* sp. nov., *Aphanisticus queenslandicus* sp. nov. from Queensland, Australia are described and figured. The species from Sulawesi belong to *A. chloris* Obenberger, 1928 species-groups and those from Australia belong to *A. endeloides* Carter, 1924 species-group. Keys to species of both groups are provided.

Key words: Coleoptera, Buprestidae, Sulawesi, Australia, *Aphanisticus queenslandicus* sp. nov., *Aphanisticus barclayi* sp. nov., *Aphanisticus sulawesicus* sp. nov., *Aphanisticus australasiae* sp. nov.

Introduction

The present paper is continuing our studies on the genus *Aphanisticus* Latreille, 1810 (Kalashian 1993, 1994, 1996, 1999, 2003, 2004; Kubáň & Kalashian 2006) and is dedicated to descriptions of two new species from Sulawesi, Indonesia and another two from Queensland, Australia. The species from Sulawesi belong to *A. chloris* Obenberger, 1928 species-groups and those from Australia belong to *A. endeloides* Carter, 1924 species-group.

Material studied is deposited in the following collections:

BMNH – The Natural History Museum, London, United Kingdom;
MKCY – M. Kalashian collection, Yerevan, Armenia;
MNHP – Museum National d'Histoire Naturelle, Paris, France;
NMPC – Národní Muzeum v Praze, Prague, Czech Republic;
VKCB – V. Kubáň collection in Národní Muzeum, Prague, Czech Republic;
ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Taxonomical part

Species-group *Aphanisticus endeloides* Carter, 1924

Body small and narrow, strongly convex, dark bronzy, bronzy-black or black with bronzy reflection. Frontovertex deeply concave, oculofrontal margins sharp, keel-shaped. Antennomeres 9-11 strongly widened, forming flat club. Pronotum on disc with two transversal gibbosities and with strongly elevated anterior and posterior margins. Each elytron prolonged apically into laterally situated acute-angled tooth; elytral surface with distinct slightly irregular and obtuse longitudinal medial keel approximately equidistant from suture and lateral margin, and shorter and less distinct presutural keel between the first one and suture.

The group was first established by Kalashian (2004) as *A. denticauda* Kalashian, 1993 species-group for three species, two from South-East Asia and one from Lombok, Indonesia (within Wallacea). Study of paratype of *Aphanisticus endeloides* Carter, 1924 in MNHP labelled "Cairns, Australie [handwritten] / Cairns [handwritten] / Aphanisticus endeloides Carter [handwritten] / Cotype, H.J.C. [handwritten] / endeloides Carter, Paratype [handwritten]" illustrated that this species belongs to the same group and thus the group is here renamed after the name of oldest species. Two more species from Australia are described below. Thus, this group is one of species-groups of Buprestidae crossing Wallace's Line and being presented both in South-East Asia and in Australia (Carter 1929).

***Aphanisticus queenslandicus* sp. nov.** (Fig. 1, plate 29 fig. 5)

Holotype ♀ BMNH, S.E. Queensland, Tambourine Mts., 1-9.v.1935/ AUSTRALIA: R.E. Turner, Brit. Mus., 1935-240.

Paratypes 5 specimens: 1♀ MKCY, same data as in holotype, but 18-25.v.1935; 1♂, 1♀ BMNH, Port Darwin, N.W. Australia, J/J/Walker; 1♂ MKCY, AUSTRALIA: Qld. [Queensland], Bundaberg, 19/ R.C.L. Perkins Coll., B.M. 1942-95; 1♂ BMNH, G.C. Champion Coll., B.M. 1927-409, without locality data.

Derivatio nominis: The new species is named after Queensland province of Australia where type material was collected.

Description: Body strongly elongate, 3.80-3.85 times as long as wide, bronzy-black, surface distinctly microreticulated with silky luster. Nearly glabrous, with few almost invisible very short hairs on abdominal sternites. Total body length 2.55-2.75 mm, width 0.65-0.71 mm. Head 1.45 times narrower than pronotum, rather large, with sides slightly convex, weakly convergent anteriorly. Clypeus turned back, situated horizontally, nearly equilaterally triangular, deeply arcuately concave distally. Postclypeal fovea large and deep, almost regularly rounded. Frons distinctly widened posteriorly, frontovertex deeply concave, irregularly narrowed to back, nearly "bottle-shaped" in dorsal aspect, concavity posteriorly not reaching anterior margin of pronotum. Oculofrontral margins sharp, keel-shaped, eyes rather large, reniform with narrow and slightly concave upper half and wide finely convex lower part. Surface of vertex and temples with shallow moderately dense punctures of moderate size. Antennomers 1 and 2 big, swollen, 3-8 small, finely enlarged distally, 9-11 strongly widened, forming flat club. Pronotum very slightly wider than elytra, approximately 1.25-1.30 times as wide as long, cordiform, widest approximately near anterior 2/5, sides slightly irregularly serrate, nearly regularly arcuate, sinuate just before posterior angles, anterior margin concave, very slightly bisinuate, posterior angles nearly straight. Posterior margin bisinuate with triangular medial lobe. Pronotum flattened along lateral margins, with rather deep and large foveiform depressions medially of posterior angles, disk convex, convexity divided by transversal depressions into convex anterior and posterior margins and two large transversal gibbosities. Surface with single very shallow, rounded punctures of moderate size. Scutellum punctiform, very small, nearly invisible. Elytra approximately 2.7 times as long as wide, their sides sinuately very slightly divergent to posterior 2/5 where elytra are widest, then firstly finely convexly, then slightly sinuately narrowed to apices; elytra lateroapically with large acute teeth dulled apically. Elytra with deep narrow transverse depressions along base medially of humeral tubercles, narrowly flattened along anterior 2/5-1/2 of sides, disk between medial keels anteriorly convex, posteriorly adpressed along suture, suture convex. Each elytron with medial keel smoothed in posterior third of elytra, presutural keel distinct in anterior third of elytra, then corroded by rough structure consisting of deep and large irregular cells, bordered longitudinally with these keels or longitudinal wrinkles, separated from each other by strong irregular transverse wrinkles, laterally of keels surface with strong and deep punctures anteriorly; sculpture smoothed posteriorly and in posterior fourth of elytra nearly inconspicuous. Ventral surface with several rather large irregular shallow punctures distinct in sternum including its medial portion, to back this structure smoothed, in last abdominal sternites nearly invisible. Male genitalia as in Fig. 1.

Sexual dimorphism: Anal sternite in male irregularly arcuate, in female cut distally with two pairs of short acute-angled teeth.

Differential diagnose: See key below.

Distribution: Australia: Queensland.

***Aphanisticus australasiae* sp. nov.** (Théry in coll.) (Fig. 2, plate 29 fig. 2)

Holotype ♂ BMNH, [Australia] Adelaide River, 91-49/ 997/ Type [round with red margin] / Aphanisticus australasiae Thery [handwritten] TYPE [printed, red].

Derivatio nominis: We are keeping the name proposed by A. Théry and originated from the name of the country of distribution.

Description: Body moderately elongate, 3.25 times as long as wide, black with inconspicuous bronzy luster, bronze, surface distinctly microreticulated with silky lustre. Nearly glabrous, with few almost invisible very short hairs on abdominal sternites. Total body length 2.85 mm, width - 0.88 mm. Head 1.6 times narrower than pronotum, rather large, with sides slightly convex, rather distinctly convergent anteriorly.

Clypeus turned back, situated horizontally, nearly equilaterally triangular, deeply arcuately concave distally. Postclypeal fovea large and deep, almost regularly rounded. Frons distinctly widened posteriorly, frontovertex deeply concave, irregularly narrowed to back, nearly "bottle-shaped" in dorsal aspect, concavity posteriorly not reaching anterior margin of pronotum. Oculofrontral margins sharp, keel-shaped, eyes rather large, reniform with narrow and slightly concave upper half and wide finely convex lower part. Surface of vertex and temples with very shallow sparse punctures. Antennomers 1 and 2 big, swollen, 3-8 small, finely enlarged distally, 9-11 strongly widened, forming flat club. Pronotum slightly wider than elytra, 1.55 times as wide as long, cordiform, widest approximately near anterior 2/5, sides slightly irregularly serrate, nearly regularly arcuate, sinuate just before posterior angles, anterior margin concave, very slightly bisinuate, posterior angles somewhat obtuse-angled, widely rounded. Posterior margin bisinuate with triangular medial lobe. Pronotum flattened along lateral margins, with rather deep and large foveiform depressions medially of posterior angles, disk convex, convexity divided by transversal depressions into convex anterior and posterior margins and two large transversal gibbosities. Surface with single large, very shallow, rounded punctures. Scutellum punctiform, very small, nearly invisible. Elytra approximately 2.4 times as long as wide, widest just behind humeri, sides sinuately very weekly convergent to posterior 2/5, then firstly finely convexly, then slightly sinuately narrowed to sharp lateroapical teeth. Elytra with deep narrow transverse depressions along base medially of humeral tubercles, narrowly flattened along anterior 2/5-1/2 of sides, disk between medial keels flattened, posteriorly adpressed along suture, suture convex. Each elytron with medial keel smoothed in posterior third of elytra, presutural keel short, distinct in anterior fourth of elytra, then corroded by rough structure consisting of deep and large irregular cells, bordered longitudinally with these keels or longitudinal wrinkles, separated from each other by strong irregular transverse wrinkles, laterally of keels surface with strong and deep punctures anteriorly; sculpture smoothed posteriorly. Ventral surface with several rather large irregular shallow punctures distinct in lateral areas of sternum and nearly invisible medially and posteriorly; anal sternite irregularly arcuate. Male genitalia as in Fig. 2.

Sexual dimorphism: Female is unknown.

Differential diagnose: See key below.

Distribution: Australia: Queensland.

Key to species of *Aphanisticus endeloides* Carter species group

1 Bigger species, body length 4 mm, body nearly black with distinct greenish luster. Eyes with whole surface slightly convex. Elytra with slight keels. Dorsal surface with smoothed microreticulation, looks shinier. Australia (Queensland) ... *A. endeloides* Carter, 1924

- Smaller species, body 2.55-3.05 mm. Eyes with slightly concave upper half and finely convex lower part. Body dark bronzy or black with bronzy luster, elytral keels more prononced. Dorsal surface microreticulated, with silky lustre ... 2

2 Body more elongate, 4.25 times as long as wide. Body 2.85 mm. Indonesia (Lombok) ... *A. bolmi* Kalashian, 2004 (Plate 29, fig. 4)

- Body more robust, 3.25-3.85 times as long as wide ... 3

3 Pronotum cordiform, widest approximately near anterior 2/5. Species from Australia (Queensland) ... 4

- Pronotum not cordiform, widest approximately at middle or behind it. Species from South-East Asia ... 5

4 Body more elongate, 3.80-3.85 times as long as wide. Smaller species, body 2.55-2.75 mm ... *A. queenslandicus* sp. nov. (Plate 29, fig. 5)

- Body more robust, 3.25 times as long as wide. Bigger species, body 2.85 mm ... *A. australasiae* sp. nov. (Plate 29, fig. 2)

5 Elytra 2.6-2.7 times as long as wide, their sculpture rougher, presutural keels shorter, somewhere corroded by rough punctures. Head less widened posteriorly. Body 2.75-2.96 mm. Thailand ... *A. kolibaci* Kalashian, 1999 (Plate 29, fig. 1)

- Elytra 2.45 times as long as wide, their sculpture finer, presutural keels longer and more distinct. Head more widened posteriorly. Body 3.05 mm. Vietnam ... *A. denticauda* Kalashian, 1993 (Plate 29, fig. 3)

Species-group *Aphanisticus chloris* Obenberger, 1928

Body small and narrow, moderately convex, dark bronzy, bronzy-black, rarely bicolorous with head and pronotum bronzy-black and elytra black with steel lustre. Head rather small, narrowed anteriorly, frontovertex deeply concave, eyes large, convex, distinctly projected from head outline, oculofrontal margins obtuse. Antennae serrate starting from antennomere 8. Pronotum widely cordiform, disc with big moderately convex central gibbosity sometimes bearing pair of shallow transversal adpressions laterally. Elytra moderately convex, with rows of punctures somewhere hyphen-shaped and fused into more or less long striae.

Species-group was established by Kalashian (2003). Majority of species are distributed in the Philippines, one species described from Malaysia (Obenberger 1928; Kalashian 2003). Two more species from Sulawesi, Indonesia are described below.

***Aphanisticus barclayi* sp. nov.** (Fig. 4, plate 30 fig. 1)

Holotype ♂ BMNH, INDONESIA: SULAWESI UTARA Dumoga-Bone N.P., February 1985/Rithamsted light trap, site 1, 200 m, H. Barlow/ R.Ent.Soc.Lond., Project Wallace, B.M. 1985-10.

Patatypes 8 specimens: 1♀ BMNH, same data as in holotype, but Lowland forest ca. 200m/ Malaise trap; 1♀ BMNH, same data as in holotype, but March 1985/ lowland forest ca. 200m/ malaise trap; 1♀ BMNH, same data as in holotype, but 13-20 March 1985/ plot B, ca.300m lowland forest/ malaise trap; 1♂ MKCY, same data as in holotype, but Tray 107/ FOG 11, 230m, 10.iii.85, BMNH Plot A; 1♀ BMNH, same data as in holotype, but April, 1985; 1♂ BMNH, same data as in holotype, but July 1985/ Tray 84/ FOG 13, 230m, 11.vii.85, BMNH Plot A; 1♀ MKCY, same data as in holotype, but July 1985/ Plot A, ca. 200 m, Lowland forest/ trap Flight interception; 1♀ MKCY, same data as in holotype, but December 1985/ lowland forest ca. 200m/ malaise trap.

Derivatio nominis: The new species is dedicated to M.Sc. Maxwell V.L. Barclay, Head Curator, Coleoptera Department of Entomology of BMNH, with our deepest gratitude and respect.

Description: Body elongate, 3.0-3.25 times as long as wide, moderately convex, dark bronzy. Surface with inconspicuous microreticulation, rather shiny. Total body length 2.32-2.85 mm, width - 0.71-0.95 mm. Head 1.65-1.75 times narrower than pronotum, with sides moderately convex, distinctly convergent anteriorly. Clypeus turned back, situated horizontally, longitudinally triangular, deeply arcuately concave distally. Postclypeal fovea large and deep, transversally oval. Frons rather narrow, very weakly widened posteriorly, frontovertex deeply arcuately concave, concavity posteriorly not reaching anterior margin of pronotum. Oculofrontral margins obtuse, rounded, eyes convex, distinctly projected from head outline. Surface of vertex and temples with single nearly indistinct small punctures. Antennae serrate from antennomere 8, antennomers 1 and 2 big, swollen, 3-7 small, finely enlarged distally, 8-10 approximately equilateral, 11 transversally oval. Pronotum slightly narrower than elytra, 1.48-1.5 times as wide as long, widely cordiform, widest between middle and anterior 1/3, sides inconspicuously irregularly serrate, nearly regularly arcuate, very weakly sinuate just before posterior angles, anterior margin slightly bisinuate, posterior margin bisinuate with triangular medial lobe, posterior angles approximately straight. Pronotum flattened along lateral margins, with large moderately deep depressions medially of posterior angles, disc with big nearly regularly convex medial gibbosity, anterior portion and posterior margin of pronotum convex. Lateral flattened portions of pronotum with irregular single nearly indistinct small punctures, gibbosity with inconspicuous traces of punctures. Scutellum rather big, triangular, slightly convex. Elytra 2.08-2.24 times as long as wide, widest just behind humeri and/ or behind middle, in this portion with slightly sinuate subparallel sides, then firstly finely convexly, then very weakly sinuately narrowed to separately slightly irregularly arcuate apices. Elytra moderately convex, narrowly flattened along sides behind humeri in anterior half, flattened or slightly adpressed along posterior 1/2-1/3 of suture. Surface of elytra with rows of punctures, anteriorly and medially round, rough, laterally and posteriorly smoothed, hyphen-like, somewhere fused into short longitudinal striae; anteriorly elytra also with irregular shallow transversal wrinkles. Prosternal process with single very small inconspicuous punctures, sternum laterally with rather dense and large flat punctures, sculpture smoothed medially and posteriorly, in middle portion of sternum and in abdominal sternits nearly invisible. Anal sternite rounded distally in both sexes. Male genitalia as in Fig. 4.

Sexual dimorphism: Sexual dimorphism very slightly pronounced in the structure of anal sternite which is slightly narrower in male than in female.

Differential diagnose: See key below.
Distribution: Indonesia: North Sulawesi, Bogani Nani Wartabone National park.

***Aphanisticus sulawesicus* sp. nov.** (Fig. 3, plate 30 fig. 4)

Holotype ♂ BMNH, INDONESIA: SULAWESI UTARA Dumoga-Bone N.P., February 1985/Tray 11 / Fog 5, 400 m, 11.ii.1985, BMNH Plot C/ R. Ent. Soc. Lond., Project Wallace, B. M. 1985-10.
Paratypes 8♀ specimens: 1♀ MKCY, same data as in holotype, but Tray 112/ Fog 3, 315 m, 8.ii.1985, BMNH Plot B; 1♀ BMNH, same data as in holotype, but March 1985/ Plot B, ca 300 m, Lowland forest/ Flight interception trap; 1♀ MKCY, same data as in holotype, but March 1985/ Plot C, ca 400 m, Lowland forest/ Flight interception trap; 1♀ BMNH, the same data, but April 1985/ Malaise trap/ Lowland forest, 200-300 m; 2♀ BMNH, 1♀ MKCY, same data as in holotype, but July 1985/ Plot A, ca 200 m, Lowland forest/ Flight interception trap; 1♀ BMNH, same data as in holotype, but November 1985/ Plot A, ca 200 m, Lowland forest/ Flight interception trap.

Derivatio nominis: The new species is named after Sulawesi Isl., Indonesia where type material was collected.
Description: Body elongate, 2.95-3.10 times as long as wide, moderately convex, dark bronzy. Surface with inconspicuous microreticulation, rather shiny. Total body length 2.83-2.90 mm, width - 0.93-0.98 mm. Head 1.65-1.70 times narrower than pronotum, with sides moderately convex, distinctly convergent anteriorly. Clypeus turned back, situated horizontally, nearly equilaterally triangular, deeply arcuately concave distally. Postclypeal fovea large and deep, almost regularly rounded. Frons rather wide, moderately widened posteriorly, frontovertex deeply arcuately concave, concavity posteriorly not reaching anterior margin of pronotum. Oculofrontral margins obtuse, rounded, eyes rather convex, moderately projected from head outline. Surface of vertex and temples with sparse small inconspicuous punctures. Antennae serrate from antennomere 8, antennomers 1 and 2 big, swollen, 3-7 small, finely enlarged distally, 8 approximately equilateral, 9-10 strongly transversal, 11 transversely oval. Pronotum very slightly narrower than elytra, 1.51-1.63 times as wide as long, widely cordiform, widest between middle and anterior 1/3, sides inconspicuously irregularly serrate, nearly regularly arcuate, weakly sinuate just before posterior angles, anterior margin slightly bisinuate, posterior margin bisinuate with triangular medial lobe, posterior angles approximately straight. Pronotum flattened along lateral margins, with large and deep depressions medially of posterior angles, disc with big medial gibbosity bearing pair of shallow transversal depressions laterally, anterior portion and posterior margin of pronotum convex. Lateral flattened portions of pronotum with irregular single small inconspicuous punctures, gibbosity with nearly indistinct traces of punctures. Scutellum rather big, triangular, slightly convex. Elytra 2.05-2.21 times as long as wide, widest just behind humeri and/ or behind middle, in this portion with very slightly sinuate subparallel sides, then firstly finely convexly, then very weakly sinuately narrowed to separately slightly angularly arcuate apices. Elytra moderately convex, narrowly flattened along sides behind humeri in anterior half, flattened or slightly adpressed along posterior 1/2-1/3 of suture. Surface of elytra with rows of punctures, anteriorly round, rough, laterally and posteriorly smoothed, hyphen-like, somewhere fused into short longitudinal striae; anteriorly elytra also with rather rough irregular transversal wrinkles. Prosternal process with single very small inconspicuous punctures, sternum with rather dense and large flat punctures, sculpture smoothed medially and posteriorly, but distinct in middle portion of sternum and in 1st abdominal sternite. Anal sternite cut distally in both sexes, with widely rounded angles. Male genitalia as in Fig. 3.
Sexual dimorphism: Very slightly pronounced in the structure of anal sternite which is cut distally slightly narrower in male than in female.
Differential diagnose: See key below.
Distribution: Indonesia: North Sulawesi, Bogani Nani Wartabone National park.

Key to species of *Aphanisticus chloris* Obenberger species group

1 Head small, about two times narrower than pronotum 2
- Head bigger, less than 1.9 times narrower than pronotum 3
2 Dorsal surface unicolorous, dark bronzy. Elevation of pronotum less convex, foveae near its base a little larger and deeper. Elytra less convex. The Philippines (Luzon). Body 3.1-3.2 mm ....
.... *A. limayicus* Obenberger, 1928 (Plate 30, fig. 6)

- Dorsal surface bicolorous, with head and pronotum bronzy-black and elytra black with steel luster. Elevation of pronotum more convex, foveae near its base a little smaller and shallower. Elytra more convex. Body 2.90-3.18 mm. Malaysia .... *A. microcephalus* Kalashian, 2003 (Plate 30, fig. 5)
3 Smaller species, body lenght 2.4 mm, more robust, 2.85 times as long as wide. The Philippines (Luzon) .... *A. brevior* Obenberger, 1928 (Plate 29, fig. 7)
- Bigger species, body lenght exceeds 2.75 mm, more elongated, more than 2.95 times as long as wide 4
4 Head somewhat smaller, 1.85-1.9 times narrower than pronotum. Body 2.75-3.0 mm. The Philippines (Luzon) ... . *A. apayaoi* Obenberger, 1928 (Plate 29, fig. 6)
- Head somewhat bigger, 1.65-1.8 times narrower than pronotum 5
5 Central elevation of pronotum with transversal adpressions lateralli 6
- Central elevation of pronotum rather regularly convex, without adpressions. Body 2.32-2.85 mm. Sulawesi .... *A. barclayi* sp. nov. (Plate 30, fig. 1)
6 Body less elongate, 2.95-3.10 times as long as wide. Body 2.83-2.90 mm. Sulawesi .... *A. sulawesicus* sp. nov. (Plate 30, fig. 4)
- Body more elongate, 3.2-3.3 times as long as wide. Species from the Philippines (Luzon) 7
7 Head more distinctly narrowed anteriorly, with sides very finely convex. Eyes smaller, less projected from head outline. Body 3.3 mm .... *A. chloris* Obenberger, 1928 (Plate 30, fig. 3)
- Head less distinctly narrowed anteriorly, with sides more convex. Eyes bigger, more projected from head outline. Body 2.78-3.38 mm .... *A. pseudochloris* Kalashian, 2003 (Plate 30, fig. 2)

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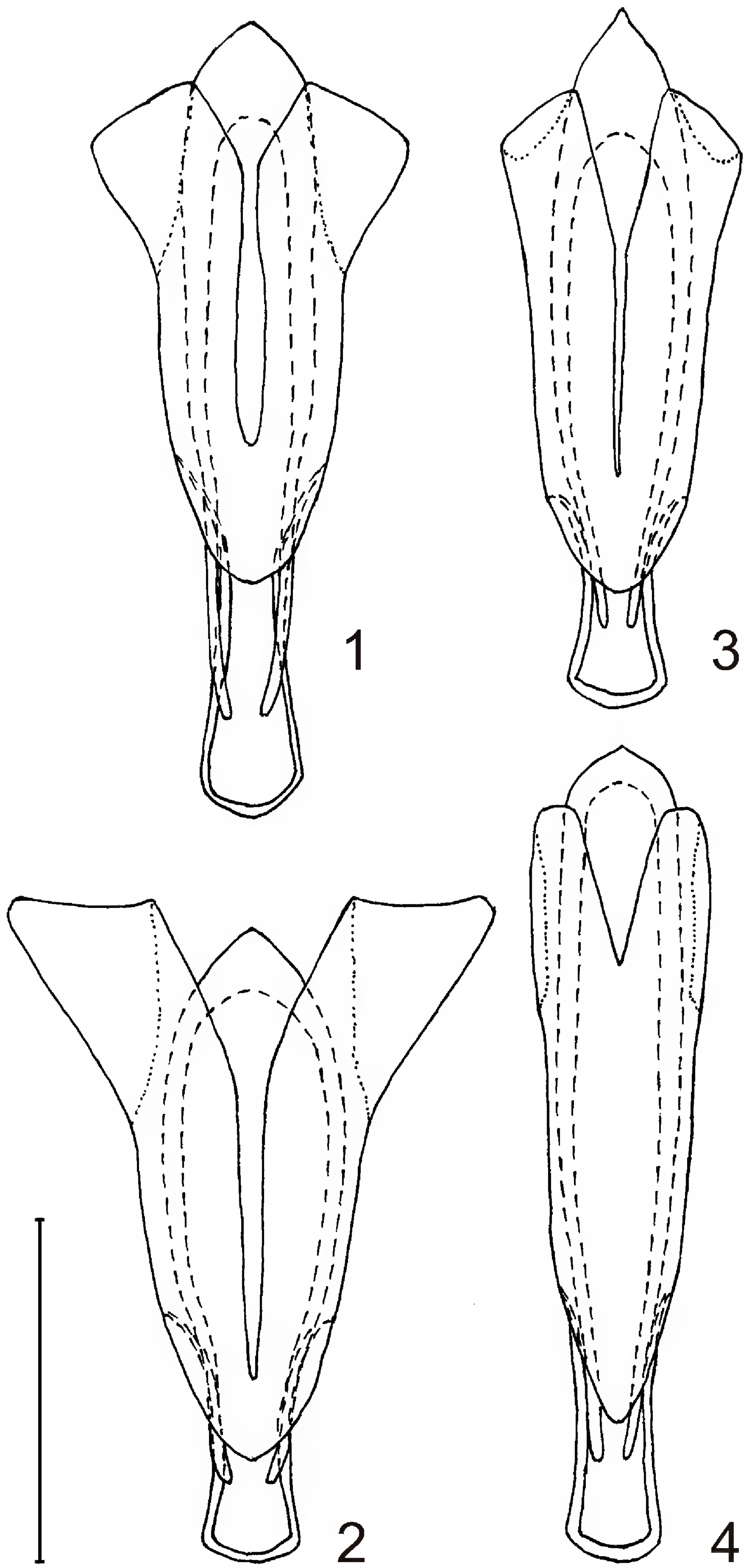

Figures 1-4. *Aphanisticus* spp., male genitalia. 1 – *A. queenslandicus* sp. nov., paratype MKCY; 2 – *A. australasiae* sp. nov., holotype BMNH; 3 – *A. sulawesicus* sp. nov., holotype BMNH; 4 – *A. barclayi* sp. nov., paratype MKCY [scale bar 0.5 mm].

Argiolestes zane sp. nov. from New Guinea (Odonata: Argiolestidae)

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Abstract: A new species of *Argiolestes* is described: *Argiolestes zane* sp. nov. (type locality: Indonesia, West Papua, S Bird's Neck, east from Kaimana, Triton bay, Lobo village environment, deposited LINC). Ecological notes on habitat (forest brooks) of holotype and paratypes localities are given.

Key words: Odonata, dragonfly, Zygoptera, Megapodagrionidae, Argiolestidae, *Argiolestes,* taxonomy, New Guinea.

Introduction

Quite recently the former subfamily Argiolestinae of family Megapodagrionidae was raised to family level (Kalkman, Theischinger 2013). The genus *Argiolestes* Selys, 1862, currently includes 11 species, found on New Guinea and adjacent islands, the northern Moluccas and on Sulawesi. Most species appear to have small ranges and none are known from more than five records (Kalkman, Theischinger 2013). The type species of *Argiolestes* is *A. australis* (Guérin-Meneville, 1830).

In this article a new species of *Argiolestes* is described, also concise ecological notes are given.

Material and methods

Specimens described below were collected using an insect net during hiking along the riverside in River Lengguru valley, in Lobo and Oray villages environment (West Papua, S Bird's Neck isthmus, Kaimana 40 km E, Triton bay), when all brooks along the small (~1 m wide) footpath were inspected. The footpath was located in the valley of lower reaches of the large river. The river valley covered by primeval lowland rainforest, except relatively small areas covered by secondary lowland rainforest and gardens around the villages and forest houses. Forest was wet with numerous small brooks and pools. Approximately 100-200 m long stretches were investigated in every brook. All visually observed or disturbed specimens were collected. Inspections were made during daytime (from 9 to 15 o'clock) in sunny weather, with temperature in forest shadow +25-30^{0}C. Information on habitat - rainforest type, dominant vegetation, brook width and flow was collected.

All specimens were preserved in 70 % ethanol. They were studied using a Leica S6D stereomicroscope. Specimen and habitat photographs in the field were taken using an Olympus E-500 camera, in the laboratory – using a Canon EOS 450D SLR camera attached to the microscope, and CombineZP software was used for image stacking. Holotype and paratypes of the new species are currently deposited in the Latvian Invertebrate collection (LINC) in Sigulda, Latvia. The holotype will be deposited in a publicly funded institution in the future.

All label data are reproduced exactly, with no corrections or additions. All labels are printed on orange paper, meaning invertebrate caught outside of the territory of Latvia.

The following abbreviations are used:

LINC – Latvian Invertebrate collection (author's collection), Sigulda, Latvia;
Fw – forewings;
Hw – hindwings.

Unique characteristics within Argiolestidae

The males of the genus *Argiolestes*, previously considered as *Argiolestes* s. str. (Kalkman et al. 2010), have several well marked characters different from other species of Argiolestidae (Kalkman & Theischinger 2013):

- the two apical lobes of the genital ligula are at least four times as long as broad;
- part of S10 and cerci are pale (whitish or blue in life) contrasting with darker S9 (clearly visible in the field). This is only visible in fully mature specimens and is more easily seen in living individuals;
- base of cercus possesses a basal flange in all species except *A. celebensis* Kalkman, 2007 and *A. tuberculiferus* Michalski, Oppel, 2010 (Kalkman 2007; Michalski, Oppel 2010).

Description of new species

***Argiolestes zane* sp. nov.** (Plates 31-34, map 1)

Holotype ♂ LINC, INDONESIA E, 16.09.2010. West Papua, S Bird's Neck, Kaimana 40 km, E, Triton bay, Lobo vill. env. 03˚45'33''S, 134˚06'11''E, 20 m; gardens & secondary rainforest on limestone, near small streams Leg. M.Kalniņš.

Paratypes 4♂ LINC, INDONESIA E, 13.09.2010. West Papua, S Bird's Neck, Kaimana 35 km, E, Triton bay, River Lengguru valley at Oray vill. 03˚43'26''S, 134˚06'06''E, 20 m; 1-2 m wide creek in second. rainforest on limestone Leg. M.Kalniņš.

Derivatio nominis: This species is named after my dear friend, the beautiful Zane Pīpkalēja, who supported me during expeditions to the Wallacea and New Guinea. The name is a person's name in the nominative case (in apposition to the generic name).

The description below is based on the male holotype. This is the same specimen which is shown in Plate 31, fig. 1. The specimen is well preserved, however one leg and the tip of the abdomen (S9-S10 and appendages) are broken off, but all parts are in one tube. One of paratype specimens also has a broken off tip of the abdomen (S8-S10 and appendages), but all parts are also in one tube. Information on color pattern is partly based on the photographs of the living insect, because preserved specimens lost the blue color on thorax and abdomen and partly lost the blue color on the face. The paratype specimens correspond very closely to the holotype and confirm the information given on coloration.

Measurements [mm]: Total body length 44, abdomen (S1-S10, without appendages) 34, Fw 29; Pt in Fw 1.9 (costal length), 2.3 (greatest length); Pt in Hw 2.0 (costal length), 2.4 (greatest length). Head: Labium pale brown with the anterior third shiny dark brown to black. Front of face, including labrum, mandibles, side margins of postclypeus bluish grey; anteclypeus dark, and lower posterior corner of genae black. The bluish grey color extends along the margin of the eye; remainder of head including antennae dull black (Plate 31, figs 2-3). Thorax: Prothorax dark brown throughout, anterior lobe of pronotum slightly paler, posterior lobe low but raised at the sides and abruptly depressed in the middle; rim with long pale hairs. Ground color of synthorax is black with a clear pattern as shown in Plate 32, fig. 1; pattern grayish-brown in the studied specimen, but blue when alive. Coxae mottled brown, trochanters pale brown, femora pale brown, but black at the knees and with a black stripe laterally. Inner side of femora not flattened. Tibiae and tarsi dark brown to black; spines black. The femora of the first, the second and the third pair of legs with respectively 9, 8, and 10 spines on outer side. Tibiae of first pair of legs with 12 spines on outer side; tibiae of second and third pair of legs with 8 and 10-11 spines on outer side respectively. Fw and Hw hyaline. Venation black. Fw and Hw of equal length and all with 2 Ax. Fw with 23-26 Px; Hw with 18-24 Px. Arculus distal to level of Ax2; discoidal cell in Fw very long, costal side ca 1.5 times as long as distal side, most acute angle ca 40°. Ac closer to Ax1 than to Ax2. Three cells between discoidal cell and subnodus. Pt – pale brown. Almost all cells beyond Pt divided. Up to three rows of cells between anal vein and hind margin of Hw. Fields between IR2 and R3, between R3 and IR3, and between IR3 and R4 containing each three or more rows of cells distally (Plate 32, figs 2-3). Abdomen: S1 and S2 dark brown (black when alive), S2 with ventral half and sides pale brown, S3-S7 dark brown (black when alive) with blue/white marks on sides and ventral part on the anterior fifth. As can be seen on Plate 33 (Fig. 1), the hind margin of S10 was white when the specimen was alive and this would probably be visible in better-preserved specimens. Hind margin of S10 without spines and slightly depressed in the middle. Epiproct upturned and prominent in dorsal view. Superior appendages as in Plate 33 (Figs 1-2). Both superior and inferior appendages white; inferiors ca 2/3 the length of superiors. As can be seen in Plate 33 (Fig. 2), the inferior appendages have two well distinguished bends with a straight or slightly curved stretch in the middle part between them and an obtuse-angled subtriangular apex. Basal flange of superior appendages ca 1/3 the length of superior appendages. Lower apical flange of superior appendages moderately expanded and simple. Upper flange far less prominent and visible mainly due to a row of black blunt denticles. The apical part of the lower apical flange is divided from the apex of the appendages by a deep incision. Outer border of superior appendages bears two moderately large and one or two small spines. Genital ligula as in Plate 33, fig. 3, with two very long and slender lateral horns.

Differential diagnosis: The male of *A. zane* sp. nov. can be distinguished from all other species of *Argiolestes* by the combination of the largely (including labrum) blue face, the front of synthorax lacking a pair of large, well-defined, marks, up to only three rows of cells between anal vein and hind margin of Hw, the moderately expanded and simple lower apical flange of the superior appendages (nearly identical with *A. roon* Kalkman, Richards, Polhemus, 2010, Fig. 2a in Kalkman et al. 2010), the long (ca 2/3 the length of superior appendages) inferior appendages having two well distinguished bends with straight or slightly curved stretch in the middle part between them and an obtuse-angled triangular apex (similar to *A. muller* Kalkman, Richards, Polhemus, 2010, Fig. 3c in Kalkman et al. 2010).

Ecological notes: What is now the holotype specimen was observed and photographed (and later collected) when resting on dead branches and leaves approximately 0.7 m above the ground, along a small, shallow brook in secondary lowland rainforest, between gardens (Plate 34, fig. 1). The brook was narrow, not exceeding 0.5 m in width at the type locality, and the clear water was flowing strongly through a series of small pools and shallow riffles. The brook runs down a mountain slope, through dense Sago palms *Metroxylon* sp., bamboo and other vegetation and was heavily shaded, with several sunny patches. What are now paratype specimens were collected on a different forest brook (Plate 34, fig. 2) some kilometers from the first, but at the base of the same mountain. This brook was narrow, not exceeding 1.5 m in width, and otherwise very similar to the one described above. It is a small unnamed tributary of the Lengguru River.

Discussion

According to Kalkman & Theischinger (2013) the species of *Argiolestes* occur on New Guinea and adjacent islands, the northern Moluccas and on Sulawesi. The new records of *A. zane* sp. nov. partly fill the gap in presently known distribution of *Argiolestes* on New Guinea between records of *A. roon* on Roon and Mioswaar islands, *A. foja* Kalkman, Richards, Polhemus, 2010 on Foja Mountains and *A. macrostylis* Ris, 1913 on Lorentz River territory (Ris 1913; Kalkman et al. 2010). However most species of *Argiolestes* Selys seem to have limited distributions and none is known from more than five records (Kalkman, Theischinger 2013).

The now known distribution of *Argiolestes* is larger to meanwhile available unidentified specimens from several places on Onin peninsula collected by the author and by Dmitry Telnov (see Map 1). The current finding of *A. zane* sp. nov. complements and confirms current limited information on habitats of the species, that the larvae of *Argiolestes* probably live in seepages and small brooks in rainforest.

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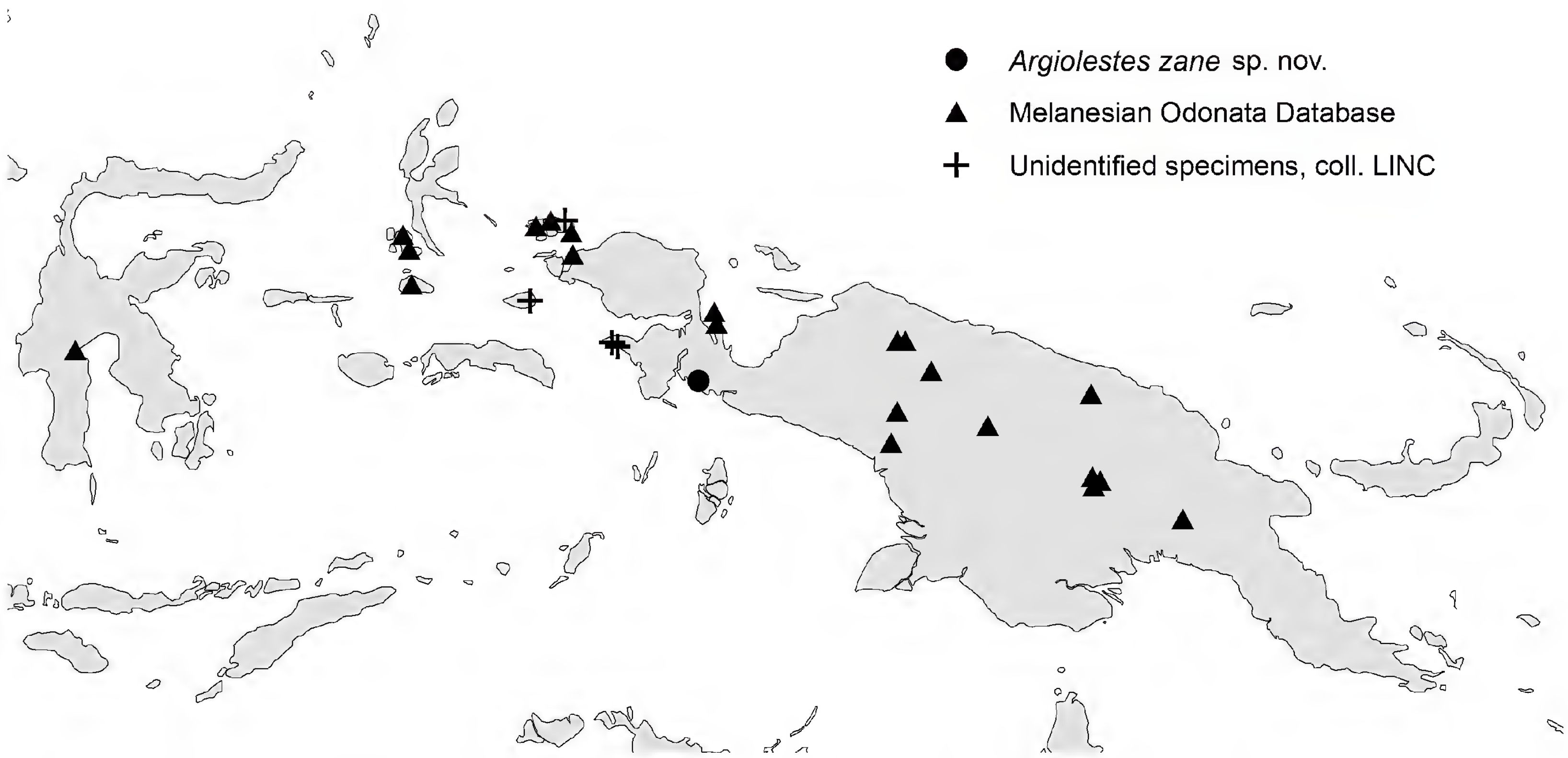

Map 1. Distribution of *Argiolestes* Selys, 1862. Based on records in the Melanesian Odonata Database with locality of *Argiolestes zane* sp. nov. and localities of unidentified specimens (updated from Kalkman, Theischinger 2013).

New species of Alticinae (Coleoptera: Chrysomelidae) from New Guinea and islands of South-East Asia

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Abstract: Eighteen new species and one subspecies of Alticinae are described from islands of South East Asia: *Nonarthra dembickyi* sp. nov., *Hemipyxis laysi* sp. nov., *Trachytetra nigricollis* sp. nov., *Chabria pascali* sp. nov., *Acrocrypta manfredi* sp. nov., *A. marginipennis* sp. nov., *A. fulva palawanica* ssp. nov., *Phygasia luzonica* sp. nov. (Philippines), *Trachytetra malucuana* sp. nov., *Manobia riedeli* sp. nov., *M. malukuana* sp. nov. (Maluku), *Sutrea sulawesiana* sp. nov., *Lipromorpha sulawesiana* sp. nov. (Sulawesi), *Sutrea cyanea* sp. nov., *S. papuana* sp. nov., *Chabria minuta* sp. nov., *Arsipoda fulvicornis* sp. nov., *A. fulva* sp. nov., and *A. gorbunovi* sp. nov. (New Guinea).

Key words: Chrysomelidae, Alticinae, SE Asia, New Guinea, new taxa, key to *Arsipoda*.

Introduction

Oriental Alticinae of Southeast Asian islands and especially New Guinea are studied till now quite unsatisfactory, for example, practically no species were known from Maluku Islands. Below I describe 18 new species and 1 new subspecies of Alticinae, among them 8 species from New Guinea 3 species from Maluku, 2 species from Sulawesi and 6 taxa from the Philippines.

In addition a key to the genus *Arsipoda* Erichson, 1842 from New Guinea is given.

Material and methods

Standard taxonomical method of study was used. Body length measurements include head. Male genitalia were fixed with water-soluble glue to beetle-bearing card. Locality labels of the type material are cited in the original version.

Acronyms of type material collections

NHMB – Naturhistorisches Museum, Basel, Switzerland;
SMNS – Staatliches Museum für Naturkunde, Stuttgart, Germany;
CLM – Collection Lev N. Medvedev, Moscow, Russia (all the holotypes currently stored in CLM will be donated to the Zoological Institute of Russian Academy of Sciences, St. Petersburg, Russia).

Descriptions of new taxa

***Nonarthra dembickyi* sp. nov.** (Fig, 1, plate 35 fig. 1)

Holotype ♂ NHMB, Philippines; Luzon; Kalinga-Ap./abra pr., pass at 17° 30'N, 121° 0'E, 1600 m, 28.III.2000, leg. L. Dembicky.

Paratypes 1 ex. NHMB, 1 ex. CLM, same locality and date as in holotype.

Derivatio nominis: Patronymic. This species is named after its collector.

Description: Head fulvous with black vertex, sometimes only on sides, antennae black with 4 basal segments more or less fulvous, prothorax and scutellum fulvous, elytra fulvous with black posterior half (Fig. 1), underside piceous with margins and apex of abdomen fulvous, legs including coxae fulvous. Body ovate, 1.5 times as long as wide. Head shining, with a few very sparse punctures on vertex, frontal tubercles feeble, partly delimited posteriorly. Antennae reach anterior third of elytra, proportions of segments are as 10-5-8-9-10-11-11-10-13, segments 4-9 widened, segment 4 elongate-triangular, 1.5 times as long as wide (Plate 35, fig. 1). Prothorax twice as wide as long, broadest at base, with straight side at margins, surface shining, practically impunctate. Scutellum triangular, smooth. Elytra 1.2 times as long as wide, shining, very finely punctuate. Aedeagus (Fig. 7) with broadly rounded apex, without any impressions on underside. Length of male 3.7-3.9 mm, of female

4.1 mm.
Differential diagnosis: Differs well from numerous Philippinese species with unusual elytral pattern and structure of antennae, having combination of triangular 4th segment and elongate 5-9 segments.

Hemipyxis laysi **sp. nov.** (Fig. 2, plate 35 fig. 2)
Holotype ♀ CLM, Philippines, N. Luzon, Kalinga province, Tulgao, 23.VI.1988, secondary vegetation, leg. Pascal Lays.

Derivatio nominis: Species is named after its collector.
Description: Fulvous, antennae black with piceous basal segment, elytra black with base and side margin, narrowed posteriorly fulvous (Fig. 2), tibiae and tarsi black. Body elongate, 1.85 times as long as wide. Head practically impunctate, clypeus with high and long central ridge, prolonged to interantennal space, frontal tubercles subquadrate, and flat, touch each other and delimited behind with deep impressed line. Antennae almost reach middle of elytra, proportions of segments are as 16-7-12-14-15-14-14-11-11-11-13, preapical segments about 3 times as long as wide. Prothorax 2.1 times as wide as long, broadest in middle, side margins rounded, anterior angles distinct and thickened, posterior angles broadly rounded, surface shining and impunctate. Scutellum triangular, impunctate. Elytra 1.5 times as long as wide, almost parallel-sided, surface shining, finely and densely punctuate. Length of body 5.2 mm.
Differential diagnosis: Near *H. maculata* (L. Medvedev, 1993) differs in other elytral pattern and black antennae, tibiae and tarsi.

Trachytetra malucuana **sp. nov.** (Fig. 8, plate 35 fig. 3)
Holotype ♂ SMNS, Malucu: Is. Ternate, Marikurubu, Gn. Gamalama, 700-1500 m, 29.X.1999, leg. A. Riedel.
Paratypes 1♀ SMNS, 1♀ CLM, same locality and date as in holotype.

Derivatio nominis: A name of the species is connected with its type locality.
Description: Metallic blue, antennae black, underside and legs black to piceous.
Labrum and clypeus sharply triangular, flat and slightly concave along midline, impunctate, frontal tubercles triangular, obliquely placed and delimited posteriorly with transverse impressed line, vertex shining, impunctate. Antennae reach behind middle of elytra, proportions of segments are as 7-5-6-6-6-5-6-6-5-5-8, preapical segments about 1.5 times as long as wide. Prothorax 1.45-1.5 times as wide as long, slightly rounded on sides, broadest in middle, anterior angles thickened and oblique, posterior angles obtusely angulated, surface without basal impression, strongly and densely punctuate, with narrow and microsculptured interspaces. Scutellum small, triangular. Elytra 1.45 times as long as wide, surface without basal convexity, strongly and densely punctuate, interspaces narrow, but mostly flat and shining. Segment 1 of fore tarsus moderately widened in male. Aedeagus (Fig. 8) cuneiform with acute apex and evenly convex on underside. Length of male 2.5 mm, of female 2.7-2.8 mm.
Differential diagnosis: Near *T. mindanaica* L. Medvedev, 1993 from the Philippines (Mindanao, Basilan), which also has metallic color of upperside and cuneiform aedeagus, but with fulvous antennae and legs, except hind femora.

Trachytetra **(*Philaphthona*)** ***nigricollis*** **sp. nov.** (Fig. 9, plate 35 fig. 4)
Holotype ♂ NHMB, Philippines; Mindoro W., Amnay river valley, 25 km SE Santa Cruz, 12°57'N, 120°56'E, 17.IV.2000, leg. Dembicky.
Paratype 1♀ CLM, same locality and date as in holotype.

Derivatio nominis: A name of species is connected with its color.
Description: Head and prothorax black, antennae fulvous with segment 1 and 6-8 black, scutellum and elytra red, underside fulvous, legs black with fulvous bases of femora.
Body elongate ovate, convex. Head impunctate, shining, clypeus sharply triangular, flat, interantennal space convex, frontal tubercles triangular, delimited posteriorly with transverse impressed line. Antennae reach apical slope of elytra, proportions of segments are as 10-5-9-8-10-9-9-8-8-6-11, preapical segments about twice as long as wide. Prothorax 1.5 times as wide as long, broadest in anterior third near thickened and angulated anterior angles, side margins straight, posterior angles distinct and slightly produced, surface shining, impunctate, with deep and slightly arcuate basal impression. Scutellum small, triangular. Elytra 1.6 times as long as wide, surface without basal convexity, shining, finely punctuate. Abdominal process between hind coxae with two sharp short ridges. Segment 1 of anterior tarsus of male practically not enlarged. Aedeagus (Fig. 9) with broadly rounded apex. Length of male 3.2 mm,

of female 3.3 mm.

Differential diagnosis: Differs from numerous species from the Philippines with unusual combination of black prothorax and red elytra, as well as specific color of antennae. This species entirely corresponds to *Philaphthona* L. Medvedev, 1993, which was described as an independent genus, but I reduce it now to subgenus of *Trachytetra* Sharp, 1886, which is very alike to subgenus *Zipangia* Heikertinger, but differs in having ridges on anterior abdominal process.

Chabria pascali **sp. nov.** (Plate 35, fig. 5)

Holotype ♀ CLM, Philippines, N. Luzon, Ifugao province, Mayoyao, 16° 59'N, 121° 14'E, 28.VII-18.VIII.1988, secondary vegetation, leg. Pascal Lays.

Derivatio nominis: Patronymic. This species is named after its collector.

Description: Fulvous, antennal segments 5-8 and legs black except fulvous anterior tibiae, which are only slightly blackish on upperside.

Body short ovate, 1.5 times as long as wide. Head impunctate, frontal tubercles transverse, sharply delimited, moderately convex. Antennae reach anterior third of elytra, proportions of segments are as 15-5-10-10-10-10-10-9-9-9-11, preapical segments about 1.5 times as long as wide. Prothorax 1.9 times as wide as long, side margins feebly arcuate, anterior angles thickened and slightly angulated, surface impunctate and shining. Scutellum triangular with rounded apex, impunctate. Elytra 1.25 times as long as wide, with rather fine and moderately dense punctures, shining, with feeble but distinct humeral tubercle. Wings present. Length of body 4.6 mm.

Differential diagnosis: This species is near *Ch. flava* (Jacoby, 1908) and *Ch. angulicornis* (Clark, 1865) (= *Dimax media* Weise, 1913). The first of them is much larger, with rounded anterior angles of prothorax, impunctate and much more elongate elytra and fulvous legs. The second species widely distributed from Thailand to Palawan, has strongly angulate anterior angles of prothorax, only one apical antennal segment fulvous and much more fine punctures of elytra.

Chabria minuta **sp. nov.** (Fig. 10)

Holotype ♂ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.

Derivatio nominis: A name of the species is connected with small size of body.

Description: Head black, antennae black with 3 basal and apical one fulvous, prothorax fulvous, scutellum black, elytra dark metallic blue with posterior half of lateral margin very narrowly fulvous, underside black, legs fulvous with black hind femora.

Body short ovate, 1.5 times as long as wide. Head impunctate, frontal tubercles obliquely placed. Antennae short, reach humeral tubercle, proportions of segments are as 10-4-3-2-4-4-5-5-6-6-9, preapical segments about as long as wide, 5 apical segments distinctly widened. Prothorax twice as wide as long, broadest behind middle, side margins arcuate, anterior angles rounded, surface impunctate, shining, without any trace of lateral callus. Scutellum triangular, impunctate. Elytra 1.2 times as long as wide, with dense and moderately strong punctures, humeral tubercle very feeble, almost indistinct. Wings developed. Segment 1 of anterior tarsus practically not widened. Aedeagus (Fig. 10). Length of body 2.3 mm.

Differential diagnosis: Differs from all species of this genus with very small size and unusual combination of fulvous prothorax and metallic blue elytra.

Manobia riedeli **sp. nov.** (Fig. 11)

Holotype ♂ SMNS, Maluku: Is. Halmahera Buli, Maba, 50-650 m, 8.XI.1999, leg. A. Riedel.

Derivatio nominis: Patronymic. This species is named after its collector.

Description: Head and upperside dark metallic blue, antennae, underside and legs black.

Head impunctate, interantennal space narrow and convex, frontal tubercles not divided from each other and posteriorly, but sharply delimited on sides with straight frontal grooves going from interantennal space to apical margin of eyes, interocular space a little wider than transverse diameter of eye. Antennae reach anterior third of elytra, proportions of segments are as 11-9-10-10-11-11-12-12-12-11-15, preapical segments about 2.5 times as long as wide. Prothorax 1.65 times as wide as long, broadest near angulate and produced anterior angles, with slightly arcuate side margins, basal lobe arcuate, antebasal transverse impression feebly arcuate, widened in middle, without punctures, remainder of surface convex, impunctate. Elytra 1.3 times as long as wide, basal convexity high and impunctate, postbasal impression shallow, remainder of surface with rows of moderately strong punctures, disappearing on apical slope, interspaces flat on dorsum and

costate on sides. Segment 1 of fore and mid tarsi not widened, narrower than segment 3. Aedeagus thin, with acute triangular apex (Fig. 11). Length of body 2.5 mm.
Differential diagnosis: This is the first species of the genus found on Maluku. It resembles *M. metallescens* L. Medvedev, 1993 from the Philippines (Mindanao), but differs with black antennae and legs as well as other form of aedeagus.

Manobia malukuana **sp. nov.**
Holotype ♀ SMNS, Maluku: Is. Halmahera Ibu, Kamp. Baru, Gn. Alon, 100-800 m, 25.XI.1999, leg. A. Riedel.

Derivatio nominis: A name of the species is connected with its type locality.
Description: Head dark fulvous with feeble metallic sheen, antennae black with segments 1-5 fulvous and apical segment pale flavous, prothorax greenish violaceous, scutellum blackish, elytra metallic blue, underside black with fulvous abdomen, legs fulvous with black femora.
Head impunctate, interantennal space narrow, ridged, this ridge is partly prolonged to clypeus, frontal tubercles poorly delimited, interocular space a little wider than transverse diameter of eye. Antennae reach middle of prothorax, proportions of segments are as 10-5-5-5-6-6-6-6-5-5-9, preapical segments about 1.5 times as long as wide. Prothorax 1.6 times as wide as long, broadest at base and feebly narrowed anteriorly, with almost straight side margins and rounded basal lobe, antebasal transverse impression feeble and biarcuate, not widened in middle, all surface, including impression, impunctate. Elytra 1.4 times as long as wide, basal convexity moderately high, with a few fine punctures, postbasal impression shallow, remainder of surface with rows of moderately strong rows reduced on apical slope, all interspaces flat. Length of body 2.9 mm.
Differential diagnosis: Differs from preceding species mostly with color of antennal, abdomen and legs. From all species of this genus differs with combination of metallic color of upperside and tricolor antennae.

Sutrea cyanea **sp. nov.** (Fig. 12, plate 35 fig. 6)
Holotype ♂ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.
Paratypes 2♀ CLM, same locality and date as in holotype.

Derivatio nominis: A name is connected with body color.
Description: Metallic blue, antennae with segments 4-7 or 5-7 black, segments 2-3 or 2-4 and 8-11 fulvous to dark fulvous, legs and scutellum black.
Body ovate. Head impunctate, interantennal space moderately broad and convex, frontal tubercles cuneiform, divided from each other with impressed line and delimited posteriorly with shallow transverse impression. Antennae reach middle of elytra, proportions of segments are as 13-7-8-8-10-12-12-12-11 (next segments absent), preapical segments about 4 times as long as wide. Prothorax twice as wide as long, broadest in middle, side margins rounded, anterior angles feebly thickened and broadly rounded, posterior angles obtusely rounded, surface shining and practically impunctate. Scutellum triangular, impunctate. Elytra 1.4—1.45 times as long as wide, broadest behind middle, surface with rather strong and dense punctures and well developed basal convexity. Segment 1 of fore tarsi feebly widened in male. Aedeagus (Fig. 12). Length of male 3.5 mm, of female 4.2 mm.
Differential diagnosis: Differs well from all known species of this genus, having fulvous or rarely black prothorax, with entirely metallic color of upperside.

Sutrea papuana **sp.nov.** (Fig. 3, plate 35 fig. 7)
Holotype ♀ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.

Derivatio nominis: A name is connected with its type locality.
Description: Head black, antennae fulvous with 5 apical segments piceous, prothorax pale flavous, scutellum black, elytra black with transverse spot before middle and other on apical slope pale flavous (Fig. 3), underside black, legs dark fulvous with black femora, except apices. Body elongate ovate. Head impunctate, shining, frontal tubercles cuneiform, strongly convex, divided by a deep impression and delimited from vertex with sharp transverse impression, interantennal space narrow and convex. Antennae reach middle of elytra, proportions of segments are as 9-4-7-7-9-8-7-6-6-6-7, preapical segments about 3 times as long as wide. Prothorax twice as wide as long, widest in middle, lateral margins arcuate, anterior angles thickened and rounded, posterior angles distinct, slightly produced, hind margin without basal lobe,

surface impunctate, shining. Scutellum triangular with rounded apex, impunctate. Elytra 1.5 times as long as wide, shining, very finely punctuate, with feeble basal convexity. Length of body 5.6 mm.
Differential diagnosis: Near *S. balyi* Jacoby, 1885 from New Guinea, differs with very fine punctures of prothorax and color of underside. It can not be a color form of *S. sexmaculata* Jacoby, 1894, in which antennae without dark apical segments, prothorax more transverse, legs fulvous with only hind femora black, body distinctly smaller.

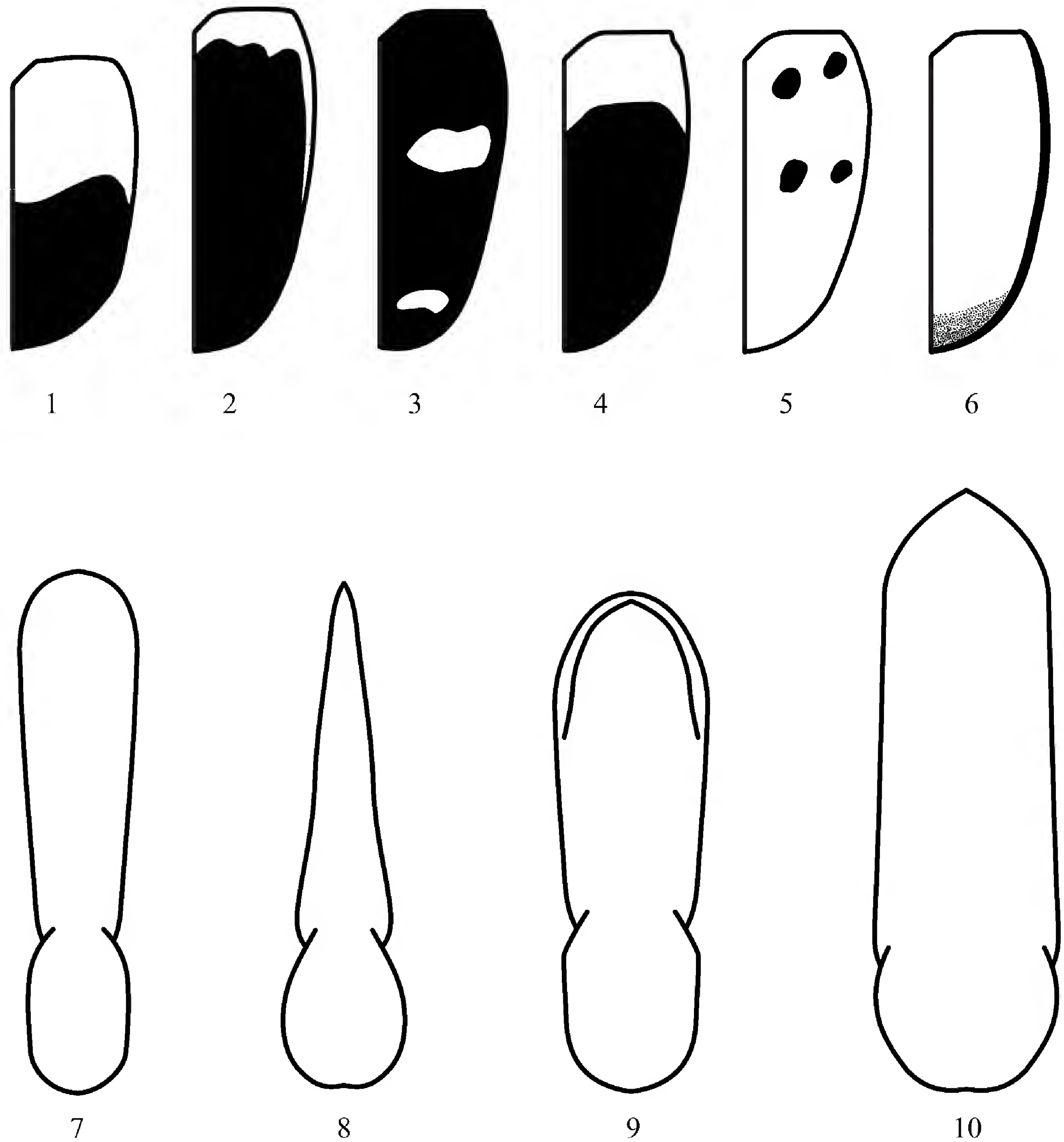
Sutrea sulawesiana **sp. nov.** (Figs 4 & 17, plate 35 fig. 8)
Holotype ♀ CLM, Indonesia, Sulawesi Utara, Duluduo, Tarout, 0° 34'N, 123° 54'E, 600 m, 17-23.IV.2008, leg. O. Gorbunov
Paratype 1♀ CLM, same locality and date as in holotype.

Derivatio nominis: A name is connected with its locality.
Description: Fulvous, elytra after basal quarter black (Fig. 4). In holotype apical segments of antennae slightly darkened. Body elongate, but very distinctly widened to behind. Head finely punctuate on vertex, shining, interantennal space moderately broad, flat, frontal tubercles long, cuneiform, divided by a deep impression, but poorly delimited from vertex. Antennae reach anterior third of elytra, proportions of segments are as 8-4-6-7-8-7-7-6-6-6-7, preapical segments about 3 times as long as wide. Prothorax 2.3 times as wide as long, widest in middle, lateral margins arcuate, anterior angles thickened, feebly rounded, posterior angles distinct, obtuse, hind margin without basal lobe, surface shining, with microscopical sparse punctures. Scutellum triangular with rounded apex, impunctate. Elytra 1.3 times as long as wide, shining, not strongly and very densely punctuate, with distinct basal convexity. Spermatheca (Fig. 17). Length of body 5.6 – 69 mm.
Differential diagnosis: Very near to *Sutrea dimidiatipennis* Jacoby, 1885, but latter species has impunctate head, feeble and not very distinct humeral tubercles, black apices of hind femora and the third antennal segment more than twice as long as the second.

Lipromorpha sulawesiana **sp. nov.** (Fig. 13, plate 35 fig. 9)
Holotype ♂ CLM, Indonesia, Central Sulawesi, W. Lore Lindu NP, 120 km. S Palu, 800-1000m, 21.IV.2005, Teabroma cacao, under forest remnants, leg. M. M. Bos.
Derivatio nominis: Named after its locality.
Description: Black, anterior part of head and antennal segments 2-5 fulvous.
Body elongate, upperside not pubescent. Head impunctate, interantennal space carinate, frontal grooves very deep, forming almost right angle in the middle, vertex finely microsculptured. Antennae thin and long, reach apical slope of elytra, proportions of segments are as 11-6-10-10-10-9-7-7-7-7-10, preapical segments about twice as long as wide. Prothorax 1.2 times as wide as long, slightly constricted behind arcuate anterior angles and much stronger in basal third, lateral margins between these constrictions straight, hind angles obtuse, surface impunctate, with feeble transverse impression behind anterior margin and practically interrupted in middle and deeply and arcuately depressed in basal quarter. Scutellum triangular with rounded apex. Elytra 1.6 times as long as wide, parallel-sided with rounded apex, with distinct horizontal and vertical part divided with more strongly costate interspace, basal convexity and postbasal impression very well developed, all rows distinct to apex, interspaces more or less convex, surface shining. Segment 1 of anterior tarsus not widened in male. Aedeagus (Fig. 13) strongly widened to distinctly bilobed apex. Length of body 2.4 mm.
Differential diagnosis: Resembles *L. fulvilabris* Jacoby from Java, 1893, but differs with black legs and sculpture of upperside; also alike at *L. nigra* L. Medvedev, 1993 and *L. tenebrosa* L. Medvedev, 1993, both from Mindanao, differs from the first with quite other form of aedeagus (Medvedev, 1993a), from the second, having also bilobed apex of aedeagus, with absence of metallic tint, black tarsi and other proportion of aedeagus.

Arsipoda fulvicornis **sp. nov.** (Fig. 14, plate 35 fig. 10)
Holotype ♂ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.

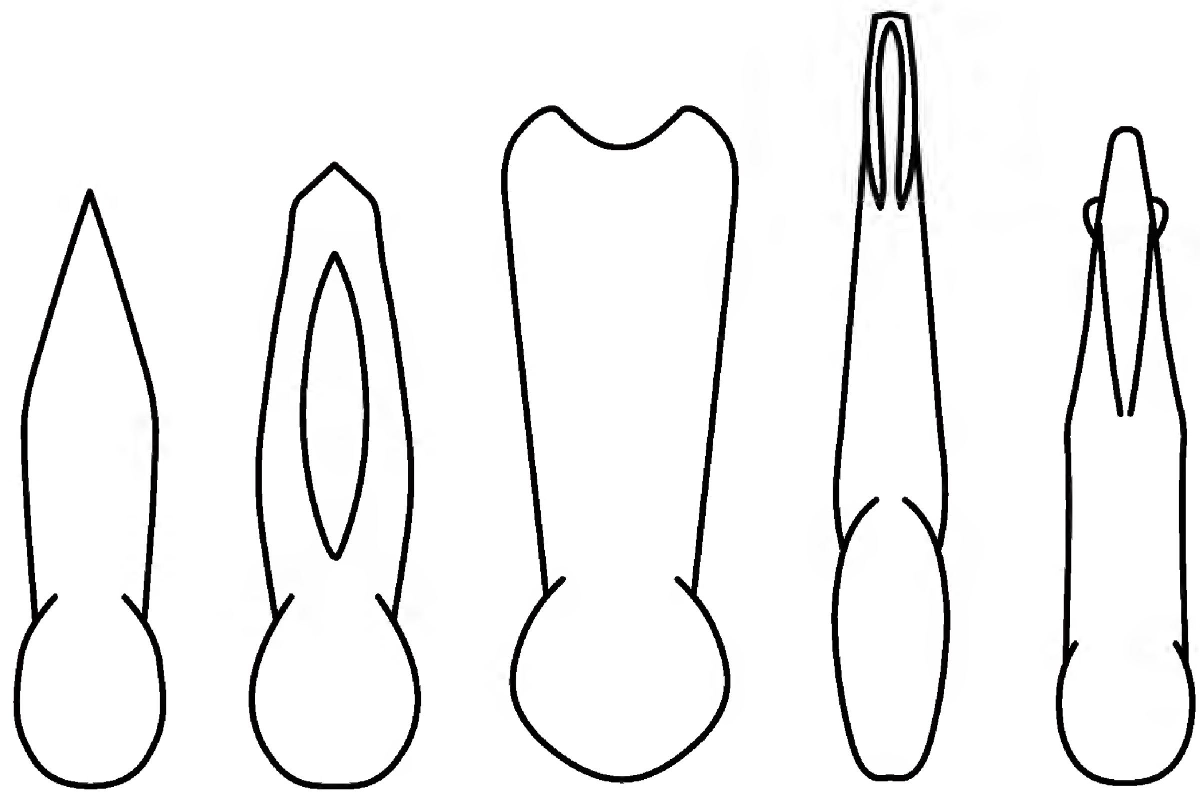
Derivatio nominis: A name is connected with color of antennae.
Description: Head, antennae, prothorax, scutellum, pro- and mesosternum fulvous, elytra dark metallic blue, metasternum, abdomen and legs black. Body elongate ovate, 2.35 times as long as wide. Head shining, impunctate, clypeus with straight anterior margin, interantennal space moderately broad, strongly convex, frontal tubercles strongly transverse and placed



Figures 1-10. New Chrysomelidae taxa. 1-6: Elytral pattern. 1 – *Nonarthra dembickyi* sp. nov.; 2 – *Hemipyxis laysi* sp. nov.; 3 – *Sutrea papuana* sp. nov.; 4 – *Sutrea sulawesiana* sp. nov.; 5 – *Acrocrypta manfredi* sp. nov.; 6 – *Acrocrypta marginipennis* sp. nov.; 7-10: Aedeagi, ventral view. 7 – *Nonarthra dembickyi* sp. nov.; 8 – *Trachytetra malucuana* sp. nov.; 9 – *Trachytetra nigricollis* sp. nov.; 10 – *Chabria minuta* sp. nov.

transversely, delimited posteriorly with impressed line, prolonged onsides in narrow and sharp ocular furrows. Antennae reach apical quarter of elytra, proportions of segments are as 13-7-11-11-14-13-13-11-11-11-16, segments 5-10 a little more thick and pubescent, preapical segments about twice as long as wide. Prothorax 2.3 times as wide as long, widest near base, feebly narrowed anteriorly and only in apical quarter more quickly converging, anterior angles thickened and narrowly arcuate, posterior angles right-angled, all angles with bristle, surface shining, very finely punctuate and feebly impressed on each side of base. Scutellum triangular, impunctate. Elytra 1.3 times as long as wide, broadest behind middle, feebly rounded on sides and broadly rounded on apex, surface shining, with very feeble rows of punctures, interspaces flat and finely punctuate. Aedeagus (Fig. 14). Length of body 5.9 mm.

Differential diagnosis: Near *A. nigripennis*



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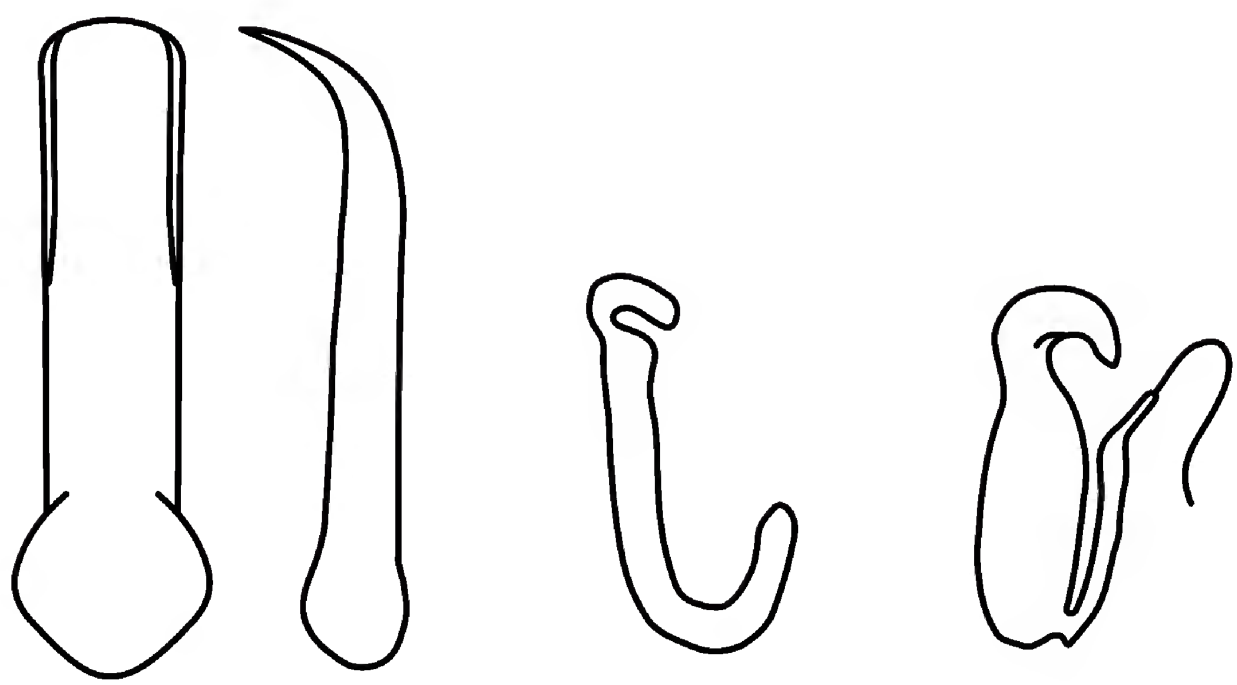

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Figures 11-18. New Chrysomelidae taxa. 11-16: Aedeagi, ventral view (Fig. 16 also lateral view). 11 – *Manobia riedeli* sp. nov.; 12 – *Sutrea cyanea* sp. nov.; 13 – *Lipromorpha sulawesiana* sp. nov.; 14 – *Arsipoda fulvicornis* sp. nov.; 15 – *A. fulva* sp. nov.; 16 – *Acrocrypta manfredi* sp. nov.; 17-18. Spermathecas. 17 – *Sutrea sulawesiana* sp. nov.; 18 – *Phygasia luzonica* sp. nov.

Weise, 1917, differs with entirely fulvous and long antennae, dark metallic elytra and black underside and legs.

***Arsipoda fulva* sp. nov.** (Fig. 15, plate 35 fig. 11)

Holotype ♂ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.

Paratype 1♀ CLM, same locality and date as in holotype

Derivatio nominis: A name is connected with color of body.

Description: Entirely fulvous, only a few apical segments of antennae more or less darkened.

Body elongate ovate, 1.65 times as long as wide. Head impunctate, shining, clypeus with straight anterior margin, interantennal space moderately broad, convex, frontal tubercles subtriangular, feebly convex, separated posteriorly with straight impressed line, which curved near eyes to behind, forming rather deep furrow along eye. Antennae reach middle of elytra, proportions of segments are as 12-6-11-10-11-11-12-11-11-10-12, segments 5-11 slightly widened and densely pubescent, preapical segments about twice as long as wide. Prothorax 2.2 times as wide as long, side margins nearly straight and slightly converging from base to thickened anterior angles, posterior angles obtuse all angles with a bristle, surface shining, with fine and very sparse punctures, impressed on either side near base with ill-defined shallow groove. Scutellum small, triangular, impunctate. Elytra 1.35 times as long as wide, feebly rounded on sides and broadly rounded on apex, very regularly punctuate, but punctures became feebler on apical slope, interspaces flat, finely punctuate. Segment 1 of fore tarsus of male practically not widened. Aedeagus (Fig. 15). Length of male 4.4 mm, of female 4.6 mm.

Differential diagnosis: Differs from all other species known from New Guinea with entirely fulvous color of body

***Arsipoda gorbunovi* sp. nov.** (Plate 35, fig. 12)

Holotype ♀ CLM, Indonesia, Papua Barat, environs of Sorong, 0° 55'S, 131° 20'E, 60 m, 27.IV-6.V.2008, leg. O. Gorbunov.

Derivatio nominis: Named after its collector.

Description: Black, 4 basal antennal segments piceous to dark fulvous, elytra with feeble aeneous sheen. Body elongate ovate, 1.8 times as long as wide. Head impunctate, anterior margin of clypeus straight, interantennal space moderately broad, convex, frons 1.5 times as wide as transverse width of eye, frontal tubercles transverse, obliquely placed, delimited behind with arcuate impressed line, prolonged along in deep ocular furrows. Antennae short, reach a little behind humeral tubercle, proportions of segments are as 13-8-10-9-12-11-11-10-10-9-14, segments 5-11 slightly thickened and densely pubescent, preapical segments about twice as long as wide. Prothorax 2.2 times as wide as long, widest behind middle, side margins rounded, anterior angles thickened and rounded, posterior angles distinct, they all with bristle, surface with fine dense punctures and distinct impression on each side of base. Scutellum triangular, small, very finely punctuate. Elytra 1.4 times as long as wide, broadest near middle, feebly rounded on sides and narrowly rounded on apex, with regular rows of punctures, more feeble apically, interspaces flat and punctures. Length of body 6.0 mm.

Differential diagnosis: Near *A. moerens* Baly, 1877, differs in having legs and apical segments of antennae black, aeneous luster of elytra and larger size.

***Acrocrypta manfredi* sp. nov.** (Figs 5 & 16, plate 35 fig. 13)

Holotype ♂ CLM, [Philippine islands] Mindanao, Surigao.

Derivatio nominis: I dedicate this species to my friend Dr. Manfred Döberl, eminent specialist on Alticinae, who revised this genus.

Description: Reddish fulvous, antennae black with segments 1-3 reddish fulvous and two apical segments fulvous, elytra each with 4 small black spots: two near base and other two just before middle (Fig. 5). Body ovate, 1.3 times as long as wide. Head shining, clypeus and frons impunctate, vertex with fine sparse punctures, anterior margin of clypeus straight, interantennal space broad, larger than diameter of antennal insertion and moderately convex, frontal tubercles triangular, feebly convex, divided from each other with hind part of antennal insertion and delimited posteriorly with arcuate impressed line. Antennae short, reach only humeral tubercle, proportions of segments are as 10-4-7-8-7-6-5-5-5-10, preapical segments as long as wide, subquadrate. Prothorax 2.65 times as wide as long, broadest at base, side margins almost straight, anterior angles broadly rounded and thickened, posterior angles narrowly rounded, surface finely punctuate, more densely in middle. Scutellum triangular, shining and impunctate. Elytra 1.3 times as long as wide, oval, surface shining, with feeble humeral tubercles, densely punctuate, with punctures stronger than on middle of prothorax. Aedeagus (Fig. 16) parallel-sided with almost truncate apex, 4.5 times as long as wide, its underside feebly convex. Length of body 4.9 mm.

Differential diagnosis: This genus is rather well studied in the Philippines (Medvedev, 1993, 1994, 1996) and later entirely revised (Döberl 2001). This new species is near *A. octopunctata* Döberl, 2001, which also has 4 spots on each elytron, which are however placed as 1-2-1, besides this species has very thin aedeagus (about 10 times as long as wide) and elongate-triangular apex.

***Acrocrypta marginipennis* sp. nov.** (Fig. 6, plate 35 fig. 14)

Holotype ♀ CLM, Philippine islands, Samar, Catbalogan.

Derivatio nominis: A name is connected with

elytral pattern.
Description: Black, antennae fulvous, elytra reddish fulvous with black lateral margin including outer part of epipleurae and blackish, poorly delimited apical area (Fig. 6), tibiae piceous, more or less mixed with fulvous color. Body ovate, 1.4 times as long as wide. Head impunctate, shining, clypeus with straight anterior margin, interantennal space broader than antennal insertion, flattened, frontal tubercles triangular, almost touch each other, feebly convex, not sharply delimited posteriorly with shallow impression. Antennae thin and very long, reach apical slope of elytra, proportions of segments are as 10-5-7-10-10-10-10-10-10-10-10, preapical segments about 5 times as long as wide. Prothorax 2.2 times as wide as long, broadest near middle, side margins feebly arcuate, anterior angles thickened, rounded with slight angulation, posterior angles broadly rounded, surface shining, finely and sparsely punctuate. Scutellum triangular, impunctate, finely microsculptured. Elytra 1.25 times as long as wide, oral, surface shining, extremely finely, almost indistinctly punctuate. Length of body 5.7 mm.
Differential diagnosis: Near *A. obsoleta* Jacoby, 1896 from Sumatra and Malacca, differs with other elytral pattern and very long and entirely fulvous antennae.

Acrocrypta fulva palawanica **ssp. nov.** (Plate 35, fig. 15)
Holotype ♂ MNHB, Palawan, Cleopatra Needle N.P., Tanabank river valley, 300 m, 20-22.XII.1990, leg. Bolm. Paratypes 3 exx MNHB, 2 exx CLM, same locality and date as in holotype.

Derivatio nominis: A name of subspecies is connected with its locality.
Description: Fulvous with elytra reddish fulvous, antennae black with 4 basal segments and basal half of apical segments fulvous. Morphologically identical with *A. fulva* L. Medvedev, 1994 sensu lato, but elytra very finely and sparsely, sometimes almost indistinctly punctate. Aedeagus same as in other 3 subspecies. Length of body 5.6-6.0 mm.
Differential diagnosis: 3 subspecies of *A. fulva* differs only in number of apical fulvous segment. A new subspecies is nearest to *A. fulva sibuyana* L. Medvedev, 1996 from Sibuyan, which has only one fulvous apical segment, but differs in having more reddish elytra with very feeble punctures and bicolor apical antennal segments.

Phygasia luzonica **sp. nov.** (Fig. 18, plate 35 fig. 16)
Holotype ♀ CLM, Luzon, Imugan.

Derivatio nominis: A name of this species is connected with its locality.
Description: Fulvous, apices of femora, tibiae and tarsi black. Body elongate. Head impunctate, clypeus with elevated anterior margin and transverse impression on each side divided with central ridge prolonged into narrow interantennal space, frontal tubercles triangular, sharply delimited posteriorly with transverse impression, interocular space 4 times as wide as transverse diameter of eye. Proportions of antennal segments are as 12-5-10-11-13, next segments absent, segments 3-5 about 2.5 times as long as wide. Prothorax 1.8 times as wide as long, broadest in anterior third, side margins and anterior angles rounded, posterior angles obtusely angulated, surface impunctate, shining, with shallow basal groove. Scutellum triangular with rounded apex, finely punctuate. Elytra 1.65 times as long as wide, finely and densely punctuate, with two ridges behind middle in lateral area and 2-3 feeble folds placed more internally. Spermatheca (Fig. 18). Length of body 8.1 mm.
Differential diagnosis: Differs from other fulvous species: *P. silacea* (Illiger, 1807) from India and *P. pallida* L. Medvedev, 2009 from Vietnam with twice more large body, partly black legs and specific sculpture of clypeus.

Key to Papuan species of *Arsipoda* Erichson, 1843

A genus *Arsipoda* Erichson, 1843 is known mostly from Australia, but 6 species were described from New Guinea (Heikertinger, Csiki 1940). Position of one species, *A. pulchra* Tryon, 1892, within the genus is quite unclear; a key to other species of New Guinea is given below.

1 Body entirely fulvous, only a few apical antennal segments darkened. Body length 4.4-4.6 mm .. *A. fulva* sp. nov.
- Upperside not entirely fulvous 2
2 Prothorax fulvous or reddish 3
- Upperside black, sometimes with metallic sheen 5
3 Elytra black. Antennae black with 4 basal segments fulvous reach to middle of elytra. Underside and legs fulvous. Body length 5.5-7.0 mm .... *A. nigripennis* Weise, 1917
- Elytra metallic to dark metallic 4
4 Elytra metallic green. Antennae fulvous with darkened apices, reach middle of elytra. Underside and legs reddish fulvous. Body length 8.0 mm .... *A. viridipennis* Weise, 1917
- Elytra dark metallic blue. Antennae entirely fulvous, reach apical quarter of elytra. Metasternum, abdomen and legs black. Body length 5.9 mm .... *A. fulvicornis* sp. nov.
5 Upperside black 6
- Upperside black with distinct metallic luster 7
6 Underside black, fore and mid legs and hind tarsi fulvous. Body length 5.7-5.8 mm.......... *A. moerens* Baly, 1877
- Breast piceous, abdomen fulvous, legs fulvous with hind femora and tibiae black to piceous. Length 6.8 mm .... *A. wallacei* Baly, 1877
7 Legs black with fulvous tarsi. Prothorax with aeneous, elytra with blue luster. Body length 4.5 mm .... *A. fulvitarsis* Weise, 1917
- Legs entirely black. Elytra with feeble aeneous luster. Body length 6.0 mm .... *A. gorbunovi* sp. nov.

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Gerontha peterseni sp. nov. - a new species from Papua New Guinea (Lepidoptera: Tineidae) found in material of the "Kaiserin Augusta-Fluß-Expedition"

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Abstract: This paper is a first result of the study of Microlepidoptera collected by the Kaiserin Augusta-Fluß-Expedition in 1912-13. A short account introduces the expedition. The genus *Gerontha* Walker, 1864 contains 24 species including the herein described species *G. peterseni* sp. nov. The male genitalia are illustrated and compared with the genitalia of *G. acrosthenia* Zaguljaev, 1972, which occurs sympatrically with the new species in Papua-New Guinea. A list of all species of the genus is provided.

Key words: Insecta, Lepidoptera, Tineidae, *Gerontha peterseni* sp. nov., Papua New Guinea, Kaiserin Augusta-Fluß-Expedition.

Introduction

The northern part of Papua-New Guinea was a German colonial territory from 1884 to 1915. During this short period of time the scientific explorations of the islands natural history was intensively promoted and ensured by the German Government. Besides activities of private collectors and ventures of individual scientists the exploration of the country was closely connected with a series of smaller and larger expeditions that were conducted to investigate the islands off the northern and eastern coast, the coastal areas and the interior of New Guinea. The last, but probably the most important expedition was undertaken from 1912-1913. It was organised by "Kaiserliches Colonial Amt" (= Imperial Office for the colonies) in Berlin and became known as the "Kaiserin Augusta-Fluß-Expedition". The target area was the Sepik (= Kaiserin Augusta Fluß) and its extensive catchment area. The expedition used a specially reconstructed river boat and advanced to the foothills of the central mountain ranges to the points where the rivers became unnavigable. Initial results of the expedition were published by Stollé (1914) and Behrmann (1917), who also wrote a narrative of the expedition five years later (Behrmann 1922). He was the geographer of the expedition and provided a detailed account of the topography, geology, watershed, and climate in the researched area, and reported on the economic situation of the indigenous people. The report did not include any data on botany, zoology, anthropology and ethnology. Results from these disciplines were published separately by members of the expedition and their co-workers (e.g. Roesicke 1914). Dr. J. Bürgers was the medical doctor and zoologist of the expedition. He collected a wide spectrum of invertebrates and vertebrates and took care of its proper preservation and safe transport. The material was sent to the Zoological Museum Berlin, where it was prepared, labelled and sorted to groups. The scientific study of the material began shortly afterwards and was carried out by group experts. Monographic treatments were produced for e.g. Phasmatodea (Günther 1929), Dermaptera (Günther 1930), Orthoptera (Günther 1938), Aves (Stresemann 1923) and Reptilia (Vogt 1932). More often, and now eventually as the typical mode, the results were published not in monographic treatments of the material of the expedition, but rather as included parts of revisions, catalogues, biogeographic and taxonomic articles (e.g. Ulmer 1915, 1938). These have appeared in a variety of journals after World War I, and even 100 years after the expedition new species descriptions have been published based on expedition material (e.g. Mey 2006, and the present article). Today, the scattered literature makes it difficult or impossible to get an idea of the zoological achievements of the expedition in general. Its significance is clearly documented in the fields of geography and ethnology, but not in zoology and also not in botany. The causes for this discrepancy are still obscure but they are probably connected with the outbreak of World War I, which led to a deep change in the organisation and structures of scientific institutions in Germany. We do not know about the intentions and plans of J. Bürgers after his return to Germany. He did not publish on the expedition, nor was he in contact with scientists of the Berlin museum, where all his material was deposited. His fate remains obscure until today.

The expedition did not collect only the insect groups mentioned above. The book of entries of the Lepidoptera section of the museum contains several inscriptions about the receipt of butterflies and moths collected and provided by Dr. Bürgers from 1912-1914. With a total of more than 6000 specimens it is an important and rich collection of Lepidoptera from north-eastern New Guinea. The material was received in samples of dried specimens carefully packed in paper envelopes of different sizes. By 1915 the material was completely set and labelled. The butterflies and larger moths were made available to experts who studied and sorted the species into the systematic collection. In contrast, the material encompassing the Microlepidoptera was transferred to the cabinets where accessions are deposited. Here, the drawers remained nearly untouched for the next 90 years.

A hundred years have elapsed since the end of the expedition. The collection of Lepidoptera was made at a time when New Guinea was in its original state. The natural environment was unspoiled and the aquatic and terrestrial ecosystems complete and intact. In the subsequent years, the catchment area of the Sepik has been gradually altered. The original environment was transformed in many places to meet the needs of a growing population and developing civilisation. The Lepidoptera of the Kaiserin Augusta-Fluß-Expedition is thus a window into the past. It is a reflection of the entomofauna of an intact environment at a time from where we have only scattered and scanty information.

The author decided to embark on a study of the material of the expedition. The present article provides not only a first, small result but is also an announcement of the existence of this material and an invitation for interested lepidopterists to participate.

Taxonomy

Tineidae: Myrmecozelinae

Gerontha Walker, 1864

Type species by monotypy: *G. captiosella* Walker, 1864: 782.

An exhaustive description of the genus was provided by Robinson & Nielsen (1993). To date, a total of 24 species are included in the genus (see Table 1).

Species of *Gerontha* Walker, 1864 are remarkable and easy to recognise Tineid moths. They are large insects with conspicuously long hindlegs. Because the moths are frequently attracted to light they are readily observed, collected and identified by most microlepidopterists.

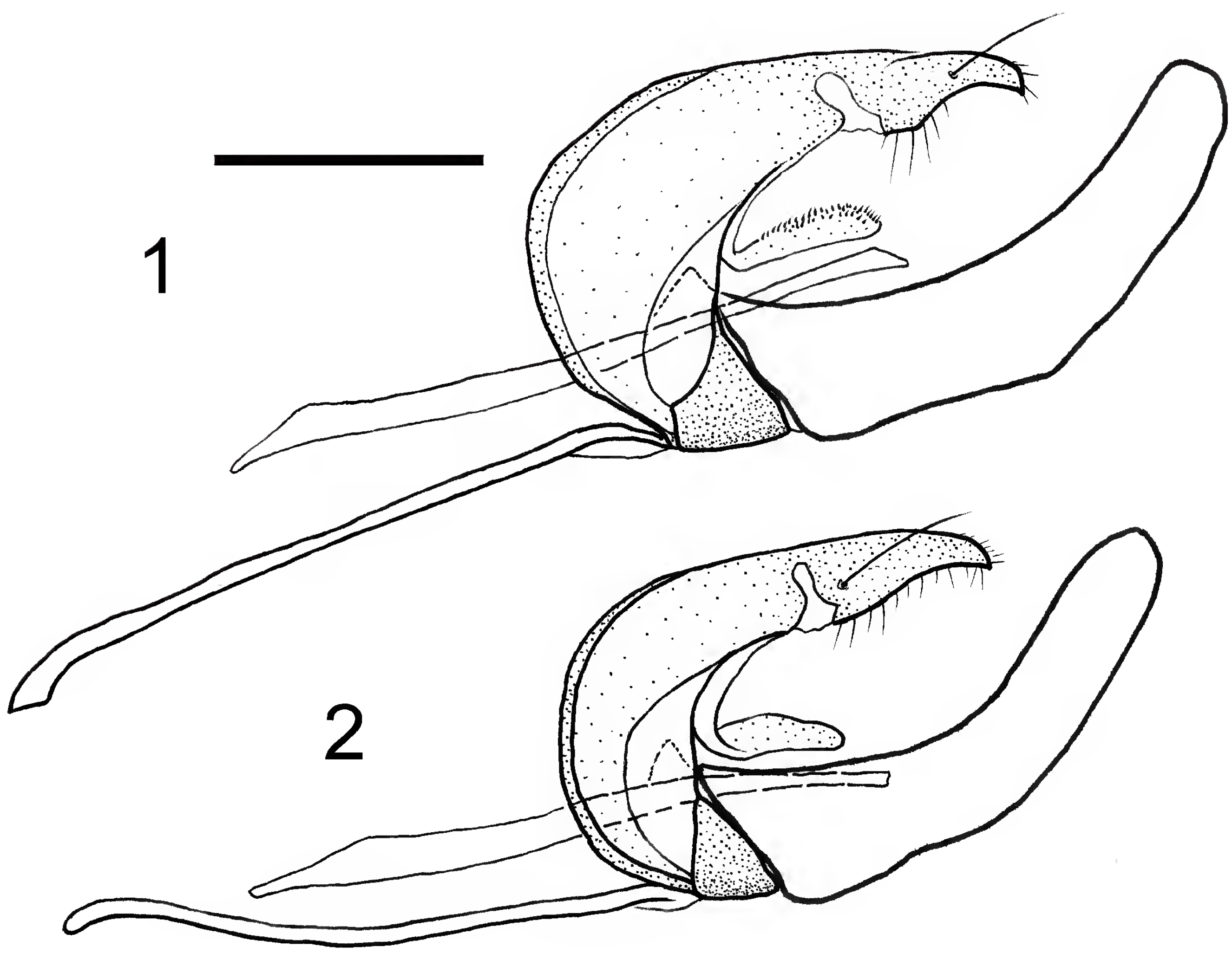
At the species level the correct identification is more difficult. According to Robinson (2009) the majority of species cannot be differentiated by external characters, even by comparing long series. Genitalia preparations are thus indispensable. The male genitalia differ in the shape of uncus, gnathos and valva. These characters provide sufficient information for the establishment of species groups. This should be done when more species are added to the genus in the future and when the unknown males of four species become known. The female genitalia are very similar to each other and exhibit only few features, which can be used for separating species. They can be found in the sterigmal area around the genital opening on the ventral side of sternum VIII.

The genus has a typical Australasian distribution (cf. Mey 2001), with extensions to the eastern Palaearctic region and to Polynesia. The taxonomic diversity is highest in the Oriental region which points to an oriental origin of this group and a subsequent colonisation of the Malesian Archipelago beyond the Sunda Shelf towards Australia.

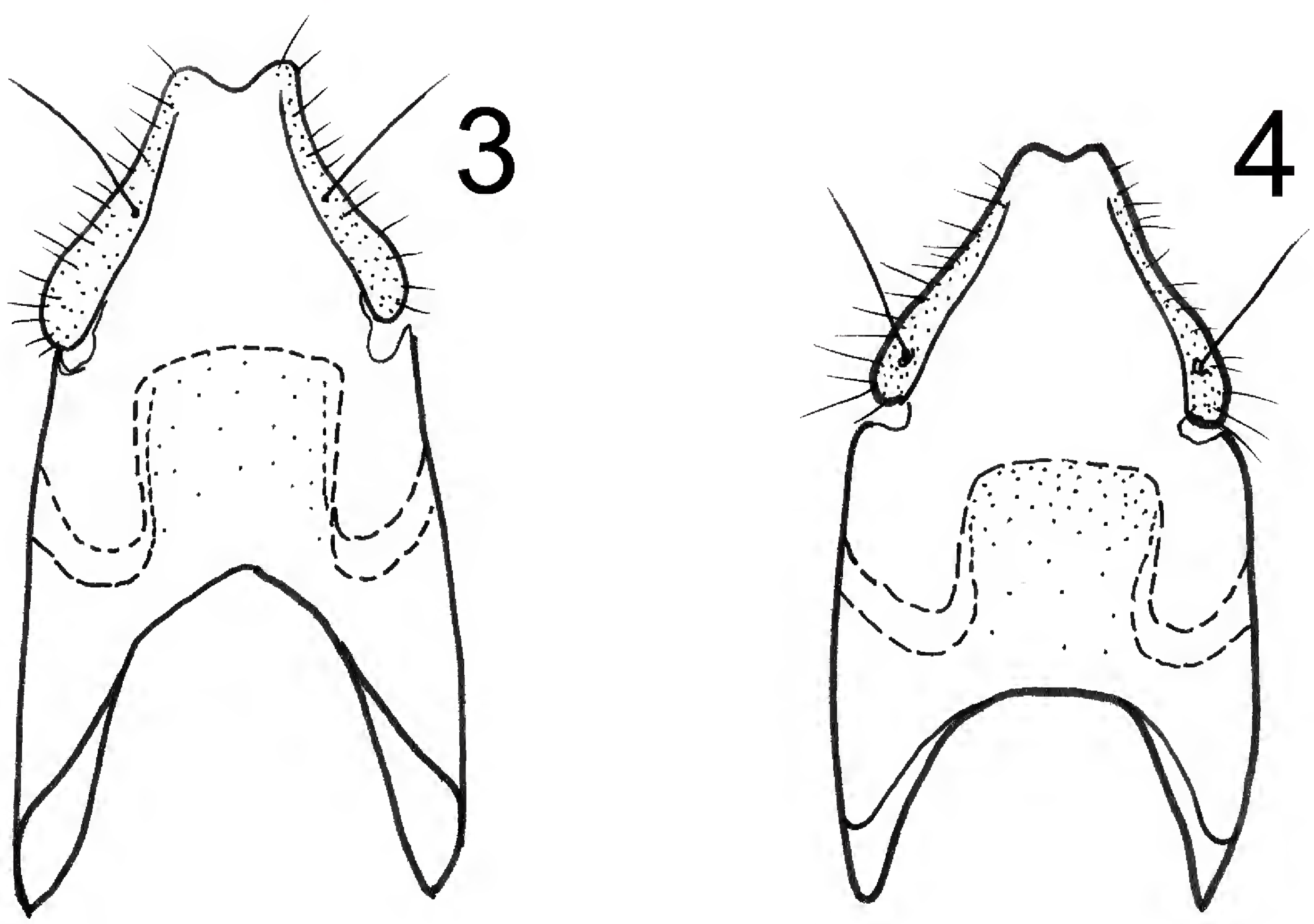
Gerontha acrosthenia Zagulajev, 1972 (Figs 1, 3, 5, 8)

Material: 1♂, 1♀ MFN, D.N. Guinea 1913/ Hauptl[a] g[er]. b[ei]. Malu 1.III.1913/ Kais[erin]. Augustafl[uss]. Exp[etition] / Bürgers S. G., 4869 and 4863, genitalia slide Mey 11/13.

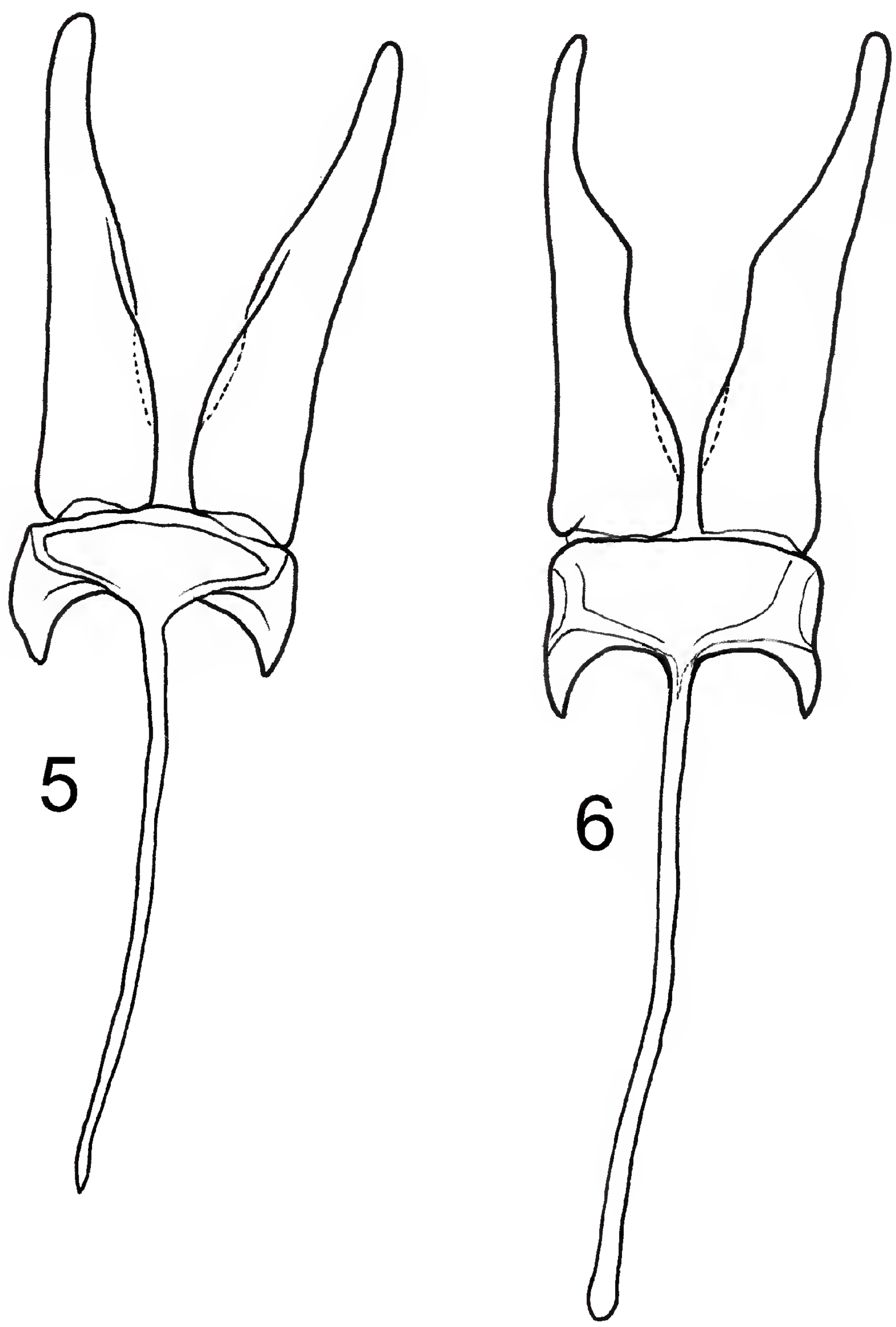
Note: This is the first record of the species from Papua New Guinea. It was expected to occur here since it was discovered in northern Australia too (Robinson, Nielsen 1993). For general distribution of this species see Table 1.



Figures 1-2. Male genitalia of *Gerontha* species, lateral view. 1 – *G. acrosthenia* Zagulajev, 1972; 2 – *G. peterseni* sp. nov., holotype, genitalia slide Mey 12/13.



Figures 3-4. Male genitalia of *Gerontha* species, dorsal view. 1 – *G. acrosthenia* Zagulajev, 1972; 2 – *G. peterseni* sp. nov., holotype, genitalia slide Mey 12/13.



Figures 5-6. Male genitalia of *Gerontha* species, ventral view. 1 – *G. acrosthenia* Zagulajev, 1972; 2 – *G. peterseni* sp. nov., holotype, genitalia slide Mey 12/13.

***Gerontha peterseni* sp. nov.** (Figs 2, 4, 6, plate 36 fig. 1, map 1)

Holotype ♂ MFN: D.N. Guinea IV 1912/ Standlager b[ei]. Malu / Kaiserin Augustafl[uss]. Exp[etition] / Bürgers S. G.", genitalia slide Mey 12/13.

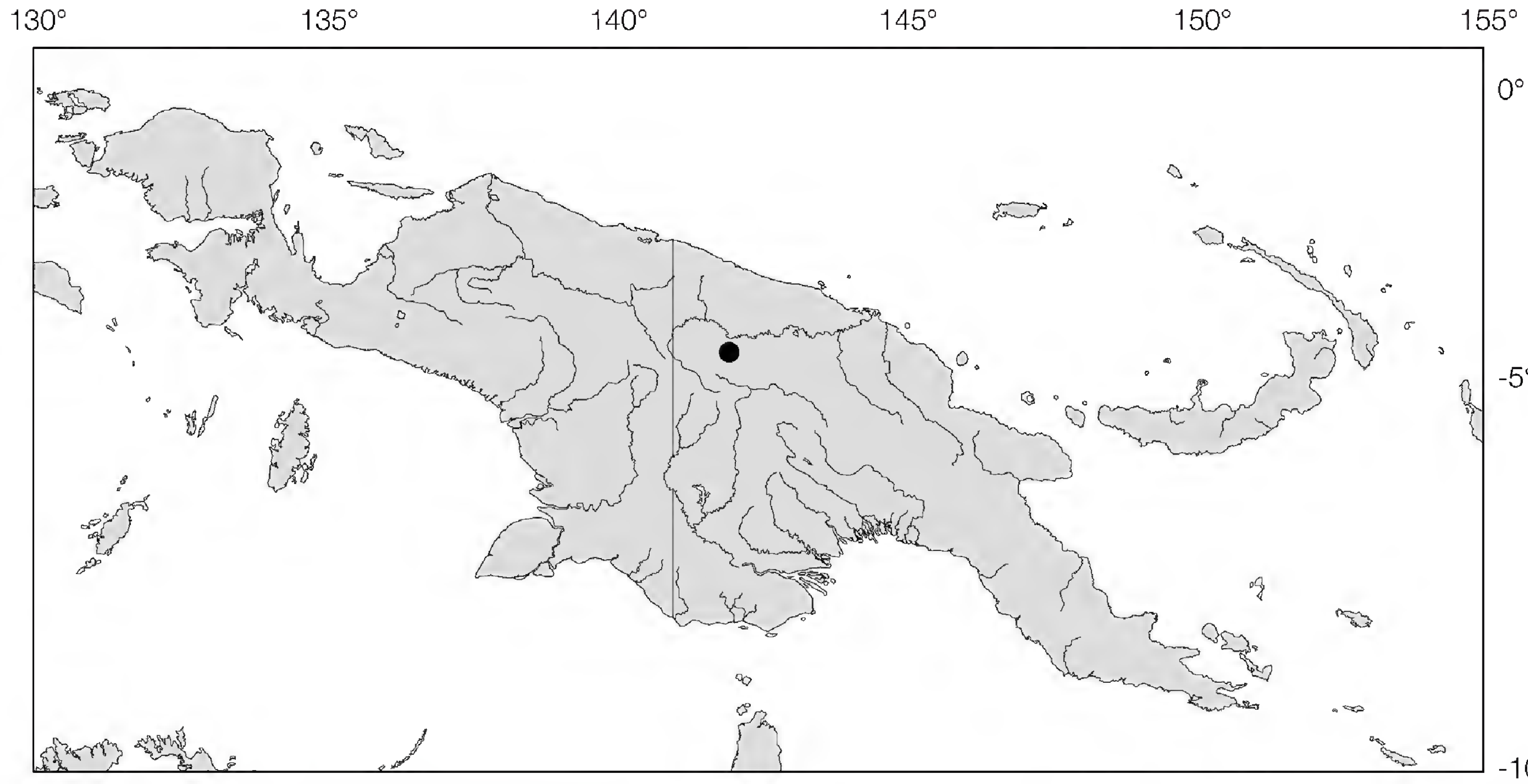
Paratype 1♂ MFN: D.N. Guinea 1913/ Hauptl[a]g[er]. b[ei]. Malu I-II. / Kais[erin]. Augustafl[uss]. Exp[etition]/ Bürgers S. G., 768/69.

Derivatio nominis: Patronymic. The new species is named in memory of Günter Petersen, famous specialist of Tineidae and kind colleague who passed away in 2012.

Description: Length of forewing 8.5-9 mm, wing span 13-15 mm; vestiture of frons and vertex grey-brown; proboscis well developed, galeae not dissociated, in apical part with small, lateral villi; labial palps ascending, second segment longest, with appressed dark brown scales on lateral sides and long, black piliform scales on ventral side; maxillary palps short, folded over base of proboscis; scape with appressed, grey-brown scales, pecten absent, flagellomeres thick, each with complete annulus of scales and a basal whorl of long, bent ciliae; fore- and middle tibia with a brush of black hairs on dorsal side, tarsus of fore and middle legs white, of hindlegs brown, tarsal segments with apical spines; forewings pale brown, with scattered darker flecks and some patches of larger, semi-erect scales, R4 and R5 with a long stalk; media in cell absent, anal veins with short basal loop; hindwings with two frenular bristles, wing membrane in the centre translucent, towards wing margin covered with small brown scales, fringe long and brown; media in cell complete, M1 and M2 with short stalk, A1 and A2 with a basal loop, A1+2 curved and forming a large anal field.

Male genitalia (Figs 2, 4, 6): Vinculum short, triangular in lateral view, nearly rectangular in ventral view, saccus as long as valvae; apex of uncus shortly bilobed, curved somewhat ventrad, lateral sides hairy, with a long bristle close to the base; gnathos broad, plate-like; basal apophyses of valvae short, without processes and without sclerotised transtilla; valvae ribbon-like, curved dorsad, aedeagus a long, slender tube, without cornuti.

Remarks: While sorting micromoths of the material of the Kaiserin Augusta-Fluß-Expedition I found two species of *Gerontha*: one of normal size and the other conspicuously smaller. A closer examination of the genitalia confirmed the presence of two distinct species, which occur sympatrically near the base camp of the expedition (Fig. 9). The larger one was identified as *G. acrosthena* Zaguljaev and the smaller one turned out to be undescribed. Both species, though differing clearly in size, have very similar genitalia. They can be distinguished by the form of the valvae and the breath of the gnathos in dorsal view. In addition, the long bristle on the lateral side of the uncus complex of the new species emerges in the middle, whereas in *G. peterseni* sp. nov. the origin of this bristle is close to the base. Both species are closely related. Its synapomorphy is the plate-like gnathos, which separates this species pair from all other members of *Gerontha*, where the gnathos is usually elongate and triangular.



Map 1. Map of New Guinea showing the locality of the main camp of the Kaiserin Augusta-Fluß expedition and the locus typicus of *Gerontha peterseni* sp. nov.

Table 1. List of hitherto described species of *Gerontha* Walker, 1864.

Species (arranged alphabetically)	**Distribution**
G. acrosthenia Zagulajev, 1972,	Indonesia: Papua; Australia; Papua New Guinea
G. albidicomans Moriuti, 1989 [1]	Malaysia: Sabah
G. amplitera Ponomarenko, Park, 1996	Korean Peninsula
G. akahatii Moriuti, 1989	Japan: Ryukyu Islands
G. borea Moriuti, 1977	Japan; Korean Peninsula
G. captiosella Walker, 1864	Sri Lanka
G. diascopa Diakonoff, 1967 [2]	The Philippines: [islands]; Malaysia: Sabah
G. dolichophallica Moriuti, 1989	Indonesia: Sulawesi
G. dracuncula Meyrick, 1928	Andaman Islands
= *G. siroii* Moriuti, 1989 [synonymised by Robinson & Tuck 1996]	Thailand
G. flexura Huang, Hirowatari, Wang, 2006	China: Hainan Island
G. hoenei Petersen, 1987	China: Yunnan
G. hyalina Moriuti, 1989	Malaysia: Sabah
G. melanopalpalis Moriuti, 1989 [3]	Indonesia: Sulawesi
G. monostigma Diakonoff, 1967	The Philippines: Mindanao
G. namhaensis Ponomarenko, Park, 1996	Korean Peninsula
G. navapuriensis Moriuti, 1989	Thailand
G. nivicaput Diakonoff, 1967	The Philippines: Luzon & Mindanao
G. opaca Moriuti, 1989	Indonesia: Sulawesi
G. peterseni sp. nov.	Papua New Guinea
G. siamensis Moriuti, 1989	Thailand
G. stheacra Zagulajev, 19721	Indonesia: Sumatra
G. sumihiroi Moriuti, 1989	Thailand; West Malaysia
G. thailandiae Moriuti, 1989	Thailand
G. tudai Moriuti, 1989	Thailand

1, 2 & 3 – These species are known from female specimens only.

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Zur Taxonomie, Synonymie und Faunistik der Apomecynini der asiatisch-australischen Region (Coleoptera: Cerambycidae: Lamiinae) Revision der Gattung *Sybra* Pascoe, 1865: Teil 4. Die Arten der *Sybra incana*-Gruppe ohne Philippinen

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Zusammenfassung: Auf Grund morphologischer und genitalmorphologischer Unterschiede können von der Großgattung *Sybra* Pascoe, 1865, eine Reihe von Arten abgegrenzt werden, die wir als *Sybra incana*-Gruppe behandeln. Zu dieser *Sybra incana*-Gruppe können derzeit 13 valide Arten gruppiert werden. In der vorliegenden Arbeit werden lediglich die fünf Arten außerhalb der Philippinen revidiert sowie taxonomische und faunistische Angaben aufgeführt. Von den derzeit mindestens acht bekannten philippinischen Arten, die sich zoogeografisch gut abgrenzen lassen, liegt nur wenig Material vor, so daß die Revision dieser Arten erst zu einem späteren Zeitpunkt erfolgt. Eine Art von Bali, *Sybra yokoi* sp. nov. wird hier neu beschrieben. *Sybra incanoides* Breuning, 1942 syn. nov. erwies sich als jüngeres Synonym von *Sybra arator* Pascoe, 1865. Alle behandelten Arten werden abgebildet und eine Bestimmungstabelle gegeben.

Key words: Cerambycidae, Lamiinae, Apomecynini, *Sybra*, new species, lectotype designations, faunistics, Oriental and Australian region.

Einleitung

Innerhalb der heterogenen Großgattung *Sybra* Pascoe, 1865, mit bisher mehr als 580 beschriebenen Taxa, lassen sich eine Reihe von Arten sowohl habituell als auch genitalmorphologisch differenzieren. Insbesondere die kompakte Körperform, ein auf den Flügeldecken bei den meisten Exemplaren vorhandener typischer, dunkler Apikalmakel (Tafel 37, Abb. 1) und die gruppenspezifisch gestalteten Fibula im Innensack (Tafel 37, Abb. 2), charakterisieren diese abgrenzbaren Arten gut. Wir nennen diese Gruppe nahe verwandter Arten *Sybra incana*-Gruppe, nach der zuerst beschriebenen Art *Sybra incana* (Pascoe, 1859). Zu der *Sybra incana*-Gruppe können derzeit 13 valide Arten zugeordnet werden, die in der orientalischen und australischen Region verbreitet sind. Auf den Philippinen sind bisher acht Arten bekannt, von allen konnten die Holotypen untersucht werden. Diese sind außerordentlich ähnlich und meistens nur mittels der männlichen Genitale zu differenzieren. Von fast allen dieser Arten liegt bisher nur das Typenmaterial vor, so daß eine Revision derzeit nicht möglich ist. Zudem liegen weitere Exemplare von den Philippinen vor, die keiner dieser bekannten Arten zugeordnet werden können. Es handelt sich hier sehr wahrscheinlich um noch nicht beschriebene Arten. Von Borneo ist bisher keine Art aus der *Sybra incana*-Gruppe beschrieben. Es liegen bisher nur zwei männliche Exemplare vor, die zu unterschiedlichen Arten gehören. Mehrere weibliche Exemplare von Borneo lassen sich nicht eindeutig zuordnen. Das trifft auch für das bei Makihara & Noerdjito (2004) aufgeführte weibliche Exemplar zu, das sicher nicht zu *Sybra incana* gehört. Auf Grund des geringen Materialumfanges sehen wir derzeit von einer Beschreibungen dieser sehr wahrscheinlich neuen Arten ab.

Die hier behandelten fünf Arten sind von der malaysischen Halbinsel und Sumatra (Indonesien) bis in den pazifischen Raum (Salomon Inseln) verbreitet, und besitzen meistens gut abgegrenzte Areale. Lediglich *Sybra incana* ist weiter verbreitet. Mit *Sybra yokoi* sp. nov. wird eine für die

Wissenschaft neue Art, von der indonesischen Insel Bali beschieben. Die Verbeitung der Arten ist auf der Karte 1 dargestellt.

Abkürzungen

BMNH – British Museum of Natural History, London, Großbritannien;
CBT – Collection Shinichi Befu, Tokyo, Japan;
CMS – Collection Ole Mehl, Struer, Dänemark;
CSH – Collection Andre Skale, Hof, Deutschland;
CTR – Collection Dmitry Telnov, Rīga, Lettland;
CWW – Collection Andreas Weigel, Wernburg, Deutschland;
CYR – Collection Yaheita Yokoi, Ratingen, Deutschland;
HNHM – Hungarian National History Museum Budapest, Ungarn;
MNHN – Musèum Nationale d'Histoire Naturelle, Paris, Frankreich;
NNM – Naturalis (Nationaal Natuurhistorisch Museum), Leiden, Niederlanden;
NUS – Raffles Museum of Biodiversity Research (National University of Singapore), Singapur;
SMNS – Staatliches Museum für Naturkunde Stuttgart, Deutschland;
USNM – Smithsonian Institution and United States National Museum (Washington), U.S.A.;
ZMB – Zoologisches Museum der Humboldt Universität Berlin, Deutschland;
IM – leg. O. Mehl;
IR – leg. A. Riedel;
IS – leg. A. Skale;
IT – leg. D. Telnov;
ITG – leg. D. Telnov & K. Greķe;
IW – leg. A. Weigel;
IY – leg. Y. Yokoi;
Ex. – Exemplar(e);
HT – Holotypus;
PT – Paratypus;
LT – Lectotypus;
PLT – Paralectotypus;
juv. – juvenil.

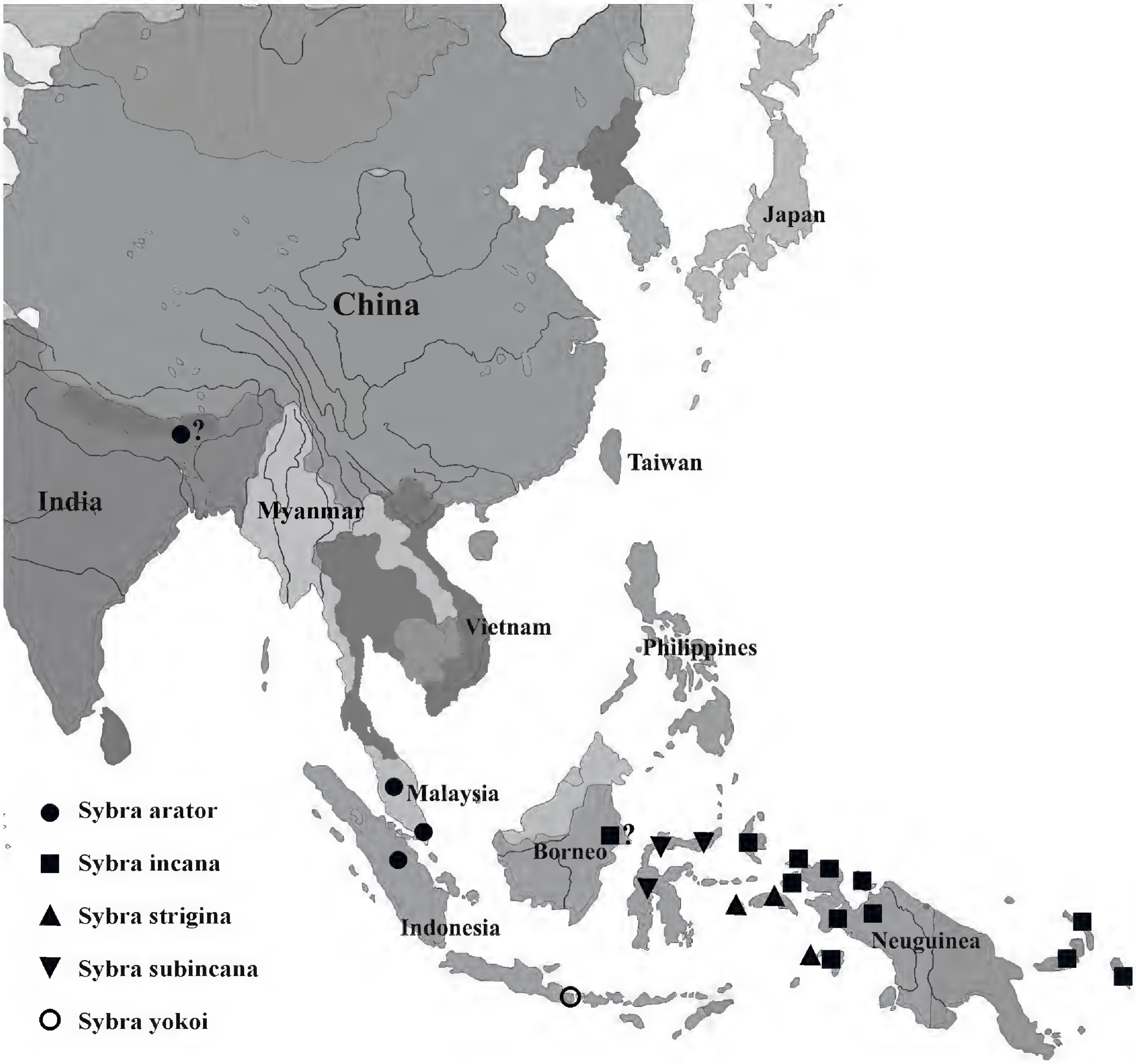
Material und Methodik

Es konnten insgesamt 35 Holo- und Paratypen sowie 185 sonstige Exemplare der *Sybra incana*-Gruppe untersucht werden. Das Material stammt aus eigenen Aufsammlungen, privaten Kollektionen und verschiedenen Museumssammlungen. Die männlichen Exemplare wurden zum Großteil genitalmorphologisch untersucht, Typen allerdings nur bei gutem Erhaltungszustand. Die herauspräparierten Genitalien wurden zusammen mit dem Exemplar auf einem weißen Kartonplättchen fixiert. Zur Präparation der männlichen Genitalstrukturen siehe Weigel, Skale (2009). Der Innensack (Endophallus) ist für die Diagnose der Arten der *incana*-Gruppe, im Gegensatz zu anderen *Sybra*-Gruppen, nicht von Bedeutung, da hier kaum verwendbare oder lediglich sehr ähnliche Oberflächenstrukturen vorkommen (Tafel 43). Der unspezifische Aedeagus der hier aufgeführten Arten ist für eine Artdiagnose nicht von Bedeutung, er wird dementsprechend nur einmal von *Sybra incana* abgebildet (Tafel 37).

Differenzierung der Fibula

Wie bereits bei (Weigel, Skale 2009, 2011) erwähnt ist die Fibula am Ende des Innensackes der männliches Aedeagus ein charakteristisches Merkmal der Gattung *Sybra*. Die Fibula ist artspezifisch und die Arten können daran leicht differenziert werden. Bei den Arten der *Sybra incana*-Gruppe ist die Fibula sehr ähnlich gestaltet, sie ist um die 0,5 mm lang und 0,3 mm breit. Zur Differenzierung der Fibula werden folgende Bezeichnungen verwendet (Tafel 37, Abb. 2). Der sklerotisierte Hauptteil der Fibula wird als „main piece" bezeichnet. Die Bezeichnung „main piece" und „Distallobus" ist beispielsweise bei der Gattung *Hydraena* Kugelann gebräuchlich (Jäch et al. 2005). Der „main piece" ist in Dorsalansicht immer symmetrisch, oft charakteristisch V-förmig gebildet (z.B. Tafel 40). Um den „main piece" befindet sich ein hautiger Sack, der als Medialsack bezeichnet wird. Der Medialsack kann bei der Präparation sehr leicht zerstört werden. Für die Diagnose der Arten hat er keine weitere Bedeutung. Der Distallobus ist ein hyaliner Anhang am „main piece", beim ausgestülpten Endophallus am distalen Ende der Fibula. Bei den Arten der *Sybra incana*-Gruppe ist der Distallobus, der um die mittig gelegene Spermaöffnung ausgebildet ist, immer mit faltigen Strukturen versehen. Diese Spermaöffnung der Fibula, die immer charakteristisch und artspezifisch gestaltet ist, nennen wir „Fibulaport". Am apikalen Ende des Distallobus hängen hyaline, hautige und oftmals blasenförmige Anhänge, die als Apicalappendices bezeichnet werden.

Nach der Sektion der Fibula aus dem Innensack, muß diese zur Diagnose in ein flüssiges Medium gelegt werden, am besten in Milchsäure (Acidium lacticum), damit die voll entfalteten Strukturen zu erkennen sind.



Karte 1. Verbreitung der Arten der *Sybra incana*-Gruppe.

Diagnose der *Sybra incana* Gruppe

Alle bisher untersuchten 13 Arten, einschließlich des Typenmaterials der philippinischen Arten (s. u. Checkliste), werden der *Sybra incana* Artengruppe innerhalb der Gattung *Sybra* zugeordnet. Die 6,5-11,5 mm großen Arten sind in der orientalischen und australischen Region verbreitet. Die Arten der *Sybra incana*-Gruppe können mit folgenden gemeinsamen Merkmalen differenziert werden:

1) Stirn trapezförmig, punktiert, mit nach innen gerichteter, einfarbig, grauer oder gelblicher Tomentierung; Clypeus gerade bis leicht nach innen gewölbt (Tafel 37, Abb. 3); Augen grob facettiert, am medialen Innenrand der unteren Augenloben mit je einer, nach außen geneigten, langen, dunklen „Sinnes"-Borste (diese ist oft abgebrochen).

2) Fühler mindestens körperlang, beim Männchen meist länger als beim Weibchen, unten gefranst; Skapus am basalen „Kugelgelenk" deutlich punktiert; 3. und 4. Fühlerglied annähernd gleich lang, ab dem 5. Glied gleichmäßig an Länge abnehmend.

3) Halsschild trapezförmig, breiter als lang, basal mit einer mehr oder weniger breiten Querfurche in Basisnähe, die Hinterecken nur angedeutet, im Bereich der Hinterecken mit deutlich gröberer Punktur, und einem größeren Porenpunkt, mit abstehender, langer, dunkler „Sinnes"-Borste (diese ist oft abgebrochen); Halsschildvorderrand

in der Mitte ungerandet; Tomentierung von einheitlich grau bis gelblich, oft mit einzelnen gelblichen Makeln oder verkürzten Längsbinden.

4) Flügeldecken gestreift punktiert, lediglich um das Schildchen mit einer unregelmäßig punktierten Fläche und der Apex meist unpunktiert; Zwischenräume unpunktiert; Epipleuren unpunktiert; Apex immer schräg abgestutzt, Außenecke zum Teil deutlich ausgezogen (*S. palawana* Aurivillius, 1927, *S. luzonica* Breuning, 1939, einzelne Exemplare von *S. incana* (Pascoe, 1859)), dieses Merkmal kann jedoch stark variieren; Tomentierung einheitlich gräulich oder gelblich, oft mit dunkler, sichelförmiger Apikalmakel (außer bei *S. biochreopunctipennis* Breuning, 1966, *S. luzonica* Breuning, 1939, *S. sibuyana* Aurivillius, 1927, *S. sexguttata* Breuning, 1939, *S. strigina* Pascoe, 1865 und einzelne Exemplare von *S. incana* (Pascoe, 1859)) und einzelnen, kleinen, weißen oder gelblichen Makeln, drei dieser Makel werden als „Grundmakel" bezeichnet, welche außer bei *S. luzonica* meist deutlich hervorgehoben sind (Tafel 37, Abb. 1):

- die vordere Makel (Basalmakel) befindet sich am Ende des ersten Flügeldeckendrittels im 4. Zwischenraum (ohne Nahtsaum),
- eine weitere Makel (Medialmakel 1) liegt im selben Zwischenraum am Ende des 2. Flügeldeckendrittels,
- die dritte Makel (Medialmakel 2) liegt im 6. Zwischenraum und ist meist etwas vor, selten hinter der Medialmakel 1 gelegen (*S. palawana*, *S. subincana* Breuning, 1968), bei *S. preapicetriangularis* Breuning, 1973, *S. preapicefuscofasiata* Breuning, 1964 und *S. arator* Pascoe, 1865 fehlt diese Makel (Tafel 38); Schultern deutlich ausgeprägt; Geschlechtsdimophismus meist deutlich: Männchen schmaler, von den Schultern bis zur Mitte mehr oder weniger parallel oder geradlinig verengt, beim Weibchen meist zur Mitte deutlich verbreitert (außer bei *S. yokoi*).

5) Beine „sybra"-typisch (siehe Weigel, Skale 2009), mit größtenteils gleichförmigen Toment; Innenseiten der Mittel- bzw. Hinterschienen apikal mit längerer, zum Teil abstehender Behaarung.

6) Unterseite: Vorderbrustfortsatz etwas niedriger als Vorderhüften, Mittelbrustfortsatz so hoch wie die Mittelhüften, Mittelbrust wenigstens teilweise medial längsgefurcht; Analsternit beim Männchen mit eckiger Ausbuchtung, beim Weibchen mit spezifischer, grubenförmiger Vertiefung.

7) Aedeagus (Tafel 37, Abb. 4-6): ventrale Lobe in Ventralansicht apikal verschmälert, meist zugespitzt und mit Medialfurche bis zum Apex; in Lateralansicht deutlich nach hinten gebogen (außer bei *S. incana* (Pascoe, 1859) und *S. strigina* Pascoe, 1865, hier nur wenig nach hinten gebogen), dorsale Lobe von ähnlicher Form, gerade (Lateralansicht) und immer deutlich kürzer; Innensack ohne markante Oberflächenstrukturen; Fibula gruppenspezifisch, Grundaufbau siehe Tafel 37, Abb. 2, Parameren mit lang ausgezogenen Apikalloben und mit spezifischer, mehr oder weniger stark behaarter Erweiterung an der Basis, diese in Lateralansicht deutlich vorstehend.

Checkliste der Arten der *Sybra incana*-Gruppe

Sybra arator Pascoe, 1865
Verbreitung: Malaysische Halbinsel, Indonesien (Sumatra), Indien (Sikkim-Darjeeling = patria falsa).

Sybra incana (Pascoe, 1859)
Verbreitung: Indonesien (Molukken, West-Papua), Papua Neuguinea, Salomon-Inseln.

Sybra strigina Pascoe, 1865
Verbreitung: Molukken (Buru, Seram, Kei-Inseln).

Sybra subincana Breuning, 1968
Verbreitung: Indonesien (Sulawesi).

Sybra yokoi sp. nov.
Verbreitung: Indonesien (Bali).

Arten der Philippinen (hier nicht mit revidiert)

Sybra biochreopunctipennis Breuning, 1966
Verbreitung: Philippinen (Bucas).

Sybra flavostictipennis Breuning, 1966
Verbreitung: Philippinen (Leyte).

Sybra luzonica Breuning, 1939
Verbreitung: Philippinen (Luzon).

Sybra palawana Aurivillius, 1927
Verbreitung: Philippinen (Palawan).

Sybra preapicefuscofasciata Breuning, 1964
Verbreitung: Philippinen (Luzon).

Sybra preapicetriangularis Breuning, 1973
Verbreitung: Philippinen (ohne nähere Angabe).

Sybra sexguttata Breuning, 1939
Verbreitung: Philippinen (Mindanao).

Sybra sibuyana Aurivillius, 1927
Verbreitung: Philippinen (Sibuyan).

Taxonomischer Teil

***Sybra arator* Pascoe, 1865** (Tafel 38, Abb. 1-7)
Sybra arator Pascoe, 1865: 210
= *Sybra incanoides* Breuning, 1942: 150 **syn. nov.**

Untersuchtes Typenmaterial:
Sybra arator: Holotypus ♂ BMNH, Sybra arator Pasc. Singaporr [sic!] [handschriftlich]; Pascoe Coll. 93-60 [gedruckt, auf Unterseite] // Type // Singapora [sic!] [handschriftlich, blaues ovales Etikett] // Sybra arator Typ Pasc. [handschriftlich] / arator [handschriftlich].
Zustand: Toment gut erhalten, linkes Vorderbein mit zwei Tarsengliedern, rechter Fühler mit 10 Gliedern, Größe: 10 mm.

Sybra incanoides: Holotypus ♂ USNM, Darjeeling / Inde britan. / Coll. J. Clermont // TYPE [rot, gedruckt] // Sybra incanoides mihi Typ det. Breuning // BLNO 000975 [hellblau] // Sybra / arator Pascoe, 1865 / rev. Skale & Weigel 2012.
Zustand: Toment relativ gut erhalten, bei beiden Fühlern nur Skapus vorhanden, rechtes Mittelbein ohne Tarsus, Größe: 6,7 mm.

Die morphologische und genitalmorphologische Untersuchung der Holotypen ergab, das beide Arten konspezifisch sind, somit ist *Sybra incanoides* ein jüngeres Synonym von *Sybra arator*. Geringe morphologische Unterschiede liegen innerhalb der Variationsbreite der Art und sind zum Teil auf den deutlichen Größenunterschied zurückzuführen. Der locus typicus von *S. incanoides* in Darjeeling (Indien) liegt weit außerhalb des Verbreitungsgebietes der Arten der *Sybra incana*-Gruppe, so daß eine Fundortverwechslung oder Verschleppung mit importierten Holz zu vermuten ist.

Weiteres Material 13 Exx:
SINGAPUR: 1♂ NNM, SINGAPORE: O. J. Saunders. B. M. 1933-227; 1♀ NUS, SINGAPORE Dairv Farm CLF & CYW 29.3.2008 on Fallen Terantang twig; 1♂ CWW, SINGAPORE: Nee Soon Pipeline CLF & CYW 5. April 2008; 1♂ CSH, SINGAPORE CLF & CYW Dr. Venus 24.I.2009; 1♀ NUS, SINGAPORE CLF & CYW Dr. Venus 25.I.2009.
SUMATRA: 2♀ CYR, Indonesia, W. Sumatra, Annai Valley, Padang, 14.-20.April 2006, IY.
MALAYSIA: 1♂ CSH, Malaysia, Selangor Bukit Lagong Alt. 200m, 24. Feb. 2008 Shinichi Befu leg. / Shinichi Befu Collection 03028; 1♀ CSB, Malaysia, Selangor Bukit Lagong Alt. 200m, 24. Feb. 2008 Shinichi Befu leg. / Shinichi Befu Collection 03029; 1♂ CSB, Malaysia, Kuala Lumpur Mont Kiara Alt. 200m, 14. May. 2006 Shinichi Befu leg. / Shinichi Befu Collection 00456; 1♀ CWW, Malaysia, Kuala Lumpur Mont Kiara Alt. 200m, 26. May. 2006 Shinichi Befu leg. / Shinichi Befu Collection 00482; 1♀ CSB, Malaysia, Kuala Lumpur Mont Kiara Alt. 200m, 26. May. 2006 Shinichi Befu leg. / Shinichi Befu Collection 00483; 1♂ CSB, Malaysia, Pahang, Bentong Alt. 250m, 16.Dec.2006 Shinichi Befu leg. / Shinichi Befu Collection 01153.

Diagnose: Größe: Männchen: 6,7-10,0 mm, Weibchen: 8,0-8,7 mm. Kopf: dunkelbraun; Taster einfarbig rötlichbraun (HT), oder basal leicht angedunkelt, letztes Glied schmal, zugespitzt, länger als das vorletzte; Clypeus gerandet, fast gerade; Stirn zwischen den Augen mäßig dicht punktiert, Zwischenräume meist deutlich größer als der Punktdurchmesser, schütter gelblichweiß tomentiert, die Tomentierung nach innen gerichtet, zwischen den oberen Augenloben mit deutlicher Längsfurche; Schläfen meist locker und weitläufig punktiert. Fühler: länger als der Körper, beim Männchen etwa zwei Glieder, beim Weibchen etwa 1 Glied länger als die Flügeldecken; Skapus walzenförmig, fast parallelseitig, etwas hinter der Mitte am breitesten, oben weißlich tomentiert; Fühlerglied 3 und 4 gleichlang, die folgenden gleichmäßig kürzer werdend, Fühlerglieder ab den 5. Glied basal etwas aufgehellt. Halsschild: Basis gerade und breiter als der Vorderrand, deutlich breiter als lang, mit deutlicher, subbasaler Vertiefung; Halsschildseiten mäßig gerundet, größte Breite etwa in der Mitte, manchmal annähernd parallelseitig, vorallem bei kleineren Exemplaren; Punktierung kräftig und dicht, Punktzwischenräume oft kleiner als die Punkte; Durchmesser der lateralen Punkte, vor allem in den Hinterecken, deutlich größer als im mittleren Teil der Scheibe; Tomentierung gelblich, mit drei dichter tomentierten Streifen, Lateralstreifen leicht schräg nach außen zeigend, basal etwa bis zur Mitte reichend, dort unterbrochen, am Vorderrand wieder deutlicher, Medialstreifen kürzer und deutlich schmaler. Flügeldecken: braun; Punktreihen mit engstehender, kräftiger Punktur, Punkte nach hinten kleiner werdend und weiter auseinanderstehend, apikal erloschen; Zwischenräume leicht gewölbt; Grundtomentierung hellbraun, Grundmakel weiß tomentiert und kaum merklich nach hinten ausgezogen, Basalmakel mäßig groß, Medialmakel 1 meist von gleicher Größe, selten kleiner, Medialmakel 2 fehlend; eine weitere weiße Makel befindet sich im 7. Zwischenraum, etwas hinter der Schulterbeule, im Basalbereich je zwei gelblich tomentierte Streifen (2. und 4. Zwischenraum), diese Tomentierung verschwommen und zum Teil auf andere Zwischenräume übergreifend, die inneren Streifen gegenüber den lateralen Halsschildstreifen gelegen; mit deutlicher, sichelförmiger Apikalmakel, diese von gelber Tomentierung umgeben, davor oft mit einzelnen weißlichen Punkten; Apex schräg abgestutzt, mit etwas ausgezogener, seitlich abstehender Außenecke; Schildchen gelblich bis grau tomentiert, apikal abgerundet. Beine: braun; Schenkel, Schienen und Tarsen „sybra"-typisch (siehe Weigel, Skale 2009); Tomentierung weißlich, Schenkel auf der Unterseite immer mit zahlreichen, eingestreuten dunkleren Flecken; Mittelschienen kurz, die apikale Hälfte beim Männchen auf der Innenseite leicht verbreitert; Schienen medial zum Teil mit verdichteter, weißlicher Tomentierung; Trochantern der Vorderbeine nach vorn, die der Mittel- und Hinter-Beine nach hinten, dicht mit weißen, zum Teil längeren, abstehenden Haaren besetzt. Unterseite Männchen: rötlichbraun; Tomentierung schmutziggelb, einzelne Flecken der Mittelbrust und zwei Reihen mit kleinen Tomentflecken auf den ersten 4 Sterniten weißlich; Mittelbrust seitlich locker und grob punktiert, medial punktfrei; eine Mittellängslinie nur in der apikalen Hälfte deutlich und vertieft, zur Basis nur angedeutet; Mittelbrustfortsatz unpunktiert, matt, apikal leicht ausgebuchtet und mit einfacher Tomentierung; Prosternalfortsatz matt, unpunktiert, mit tiefen Gruben und lateralen Erhöhungen, neben der Tomentierung nur mit wenigen längeren, abstehenden Haaren; letztes Sternit apikal tief ausgebuchtet. Unterseite Weibchen: Mittelbrustfortsatz sehr variabel, meist gerade, zum Teil aber auch deutlich dreieckig ausgeschnitten; Prosternalfortsatz ähnlich wie beim Männchen mit einzelnen, abstehenden Haaren; letztes Sternit medial mit deutlicher, länglicher Vertiefung, diese fast über das ganze Sternit reichend. Aedeagus: ventrale Lobe am Apex breit, spitz auslaufend; in Lateralansicht nur wenig nach hinten gebogen; dorsale Lobe von ähnlicher Form, kürzer; Innensack vor der Fibula leicht angedunkelt. Fibula (Tafel 38, Abb. 4-7): 0,41-0,46 mm (HT) lang; main piece einteilig, basal ventralwärts erweitert, Erweiterung in Ventralansicht kräftig, U-förmig, an den Enden ausgerandet; main piece in Lateralansicht basal gerundet erweitert; Medialsack äußerst engmaschig strukturiert, leicht angedunkelt; Distallobus ventral mit breiter, fast gerader Basis, die stark wulstigen Falten lateral fast gerade, medial nur unmittelbar unterhalb des Fibulaport stark gewellt, in Lateral- und Dorsalansicht mit kräftigen, meist geraden Falten; Fibulaport hyalin, mit schwer sichtbaren Strukturen, in Lateralansicht deutlich zahnartig vorstehend; Apicalappendices hyalin, ohne Strukturen, basal miteinander verbunden, apikal abgerundet, in Lateralansicht apikal zugespitzt. Parameren (Tafel 38, Abb. 3): Apikalloben gerundet verengt; längere Behaarung am Apex und oberhalb der schmal verrundeten Erweiterung an der Basis, diese in Lateralansicht deutlich vortretend, medial neben wenigen längeren Haaren nur mit kurzen, meist nach außen gerichteten Borsten besetzt. Genitaltergit: trapezförmig, subapikal, meist abgerundet, selten mit angedeuteten Außenecken; Vorderrand medial meist seicht ausgebuchtet und mit kräftiger, dunkler Behaarung.

Geschlechtsdimorphismus: Männchen mit deutlich längeren Fühlern und ohne längliche Vertiefung im letzten Sternit.

Differentialdiagnose: Von den ähnlichen *Sybra incana* (Pascoe) und *Sybra subincana* Breuning durch den fehlenden Medialmakel 2 und das oft parallelseitig wirkende Pronotum verschieden. *S. subincana* hat zudem einen einfarbigen Halsschild und im männilchem Geschlecht deutlich längere Fühler.

Da bisher nur wenig Material vorliegt und die Variationsbreite dementsprechend nur ungenügend abgeschätzt werden kann, ist die Differenzialdiagnose als vorläufig zu werten.

Verbreitung: Bisher von West-Malaysia und Sumatra (Indonesien) bekannt, die Angabe von Indien (HT von *S. incanoides*) ist als patria falsa zu werten.

***Sybra incana* (Pascoe, 1859)** (Tafeln 39-40)

Sybra incana (Pascoe, 1859): 50

= *Sybra mucronata* Pascoe, 1865: 214 (Weigel, Skale 2009)

= *Sybra pseudincana* Breuning, 1939: 251 (Weigel, Skale 2009)

Untersuchtes Typenmaterial:

Sybra incana: Holotypus ♀ BMNH, Ropica incana typ Pasc [handschriftlich] // Type // Aru / Sybra incana, Pasc.

Aru Is. / Pascoe Coll. 93-60 [gedruckt, auf Unterseite].
Sybra mucronata: Holotypus ♀ BMNH, Sybra mucronata Pasc. Geilolo [Halmahera] / Pascoe Coll. 93-60 [gedruckt, auf Unterseite] // Type // Geil. / Sybra mucronata.
Sybra pseudincana: Holotypus ♂ BMNH, Sybra pseudincana mihi Typ det. Breuning // Type // Pres. by Imp. Inst. En ?. / B. M. 1938-29 // 1421 // SOLOMON IS / Guadalcanal / Kookoom / 31.iii.19 / R. A, Lever.
Weiteres Material 37 Exx, weitere 89 Exx siehe Weigel, Skale (2009):
MOLUKKEN: 2♂, 1♀ CMS & CSH, INDONESIA or. ARU-ISLANDS, Warmar island, vic. Dobo, S5°47'54''/ E134°13'0'', 20m, 14.-17.II.2011 (12), IM, IS; 3♂, 2♀ CMS, CSH & CWW, INDONESIA or. ARU-ISLANDS, Wokam island, vic. Samang vill., S5°40'20''/E134°15'08'', 10-20m, 15.II.2011 (12), IM, IS, IW.
W-PAPUA: 1♂ CTR, INDONESIA E, Prov. Raja Ampat, distr. Misool Barat, Yan Island, Lilinta (Lelintha) vill. 20 km SW, 02°07'53''S, 130°07'17''E, 02.IV.2009, primeval coastal semidry vegetation, beaten from dry branches, ITG; 1♀ CMS, INDONESIA W.PAPUA 10km NE Kaimana (02), 1.ii.2011, S3°34'42'', E133°42'41''; 5♂, 4♀ CMS, CSH & CWW, INDONESIA W-PAPUA vic. Kaimana, road 18 km NE, S3°31'11''/E133°40'15'', 50-80m, 21.- 25.II.2011, IM, IS, IW; 2♀ CTR, INDONESIA E, West PAPUA, S Bird`s Neck, Kaimana 2-4 km NE, 3°39'26''S, 133°46'21''E, 150-200 m, 19-20.IX.2010, primeval lowland rainforest & fresh clearing, limestone, IT; 2♀ CTR, INDONESIA E, 16.09.2010 West Papua, S Bird`s Neck, Kaimana 40 km, E, Triton bay, Lobo vill. env., 03°44'08''S, 134°05'40''E, 100 m, gardens, secondary coastal forest Leg. M. Kalniņš; 1♂, 1♀ CSH & CWW, INDONESIA W-PAPUA 50km SE Kaimana, Triton Bay, vic. Kamaka vill., S3°49'50''/E134°11'27'', 10-50m, 02. – 05.II.2011, IS, IW; 1♀ CMS, INDONESIA W.PAPUA 130km SE Kaimana (08), Yamor river vic., 9-11.ii.2011, S84°05'49'', E134°54'09'', IM; 1♂, 3♀ CMS, INDONESIEN Oriental Biak Is., Mniber vic., Dec. 2006, Biak Mniber, 00.43.288S, 135.46.018E, IM; 1 Ex. CMS, INDONESIEN Or. Yapen Is., 20km W Serui, Dec. 2006, Yapen Serui and vic., 01.52.114S, 136.14.189E, IM; 2♂, 1♀ CMS, INDONESIEN Oriental Yapen Is., 20km W Serui vic., Jan. 2007, Yapen Serui and vic. 01.52.114S, 136.14.189E, IM; 1 Ex. CTR, INDONESIA E, Raja Ampat, Waigeo Island, Waisai 3km W, 00°26'04"S, 130°47'41"E, 40-50m, 20.II.2012, secondary lowland rainforest on limestone & clearing, MV light, IT.
PAPUA NEUGUINEA: 1♀ ZMB, Neu Britannien, 26. Ralum, 7.96, F. Dahl S. Sybra flavomarmorata Br., Breuning det.
BORNEO: 1♀ Gunung Sari (Makihara, Noerdjito 2004), das Exemplar wurde von uns nicht untersucht, es gehört sicher nicht zu *Sybra incana*. In Borneo sind mindestens zwei weitere, bisher nicht beschrieben Arten aus der *Sybra incana*-Gruppe bekannt (siehe oben).

Bemerkung: Die Untersuchung von umfangreichem Material hat gezeigt, daß es sich bei *S. incana* um eine weit verbreitete und sehr variable Art handelt. Insbesondere bei Inselvorkommen (Halmahera, Misool, Biak, Yapen) treten stärkere individuelle Abweichungen bei einzelnen morphologischen Merkmalen (z.B. Färbung, Flügeldeckenstreifung, Apexform etc.) auf. Die Ausbildung der charakteristischen Fibula, als sicheres und konstantes artspezifisches Merkmal, erlaubt die eindeutige Diagnose zumindest von männlichen Individuen.
Diagnose: Größe Männchen: 7,0-10,9 mm, Weibchen: 7,8-10,7 mm. Kopf: dunkelbraun; Taster einfarbig hellbraun, letztes Glied schmal, zugespitzt, deutlich länger als das vorletzte; Clypeus gerandet, meist nach innen gewölbt, selten annähernd gerade; Stirn zwischen den Augen dicht punktiert, Zwischenräume meist annähernd so groß wie der Punktdurchmesser, seltener größer; schütter bräunlich behaart, diese Behaarung nach innen gerichtet; zwischen den oberen Augenloben mit deutlicher Längsfurche; Schläfen fein bis deutlich punktiert, bei Tieren von Halmahera unpunktiert. Fühler: Fühlerlänge variabel, oft abhängig von der Größe des Exemplars, beim Männchen den Körper meist um 1 bis 2 Glieder überragend, bei einem großen Männchen aus Yapen fast um 3 Glieder länger, beim Weibchen zum Teil deutlich kürzer als die Flügeldecken, selten diese um maximal 1 Glied überragend; Skapus walzenförmig, fast parallelseitig, medial nur wenig verbreitert, Oberflächenstruktur wie restliche Fühlerglieder; Tomentierung bräunlich, ab 5. Glied basal nur geringfügig aufgehellt, beim Männchen 4. Glied etwas länger als 3. Glied, bei den Weibchen 3. und 4. Fühlerglieder meistens annähernd gleichlang, Glieder ab den 5. Glied gleichmäßig kürzer werdend. Halsschild: auffallend breit (besonders bei einzelnen Weibchen aus Biak), Basis gerade, zum Vorderrand leicht gerundet verengt, mit deutlich angedeuteten Hinterecken und deutlicher subbasaler Vertiefung; Punktierung variabel, medial meist dicht, Punktzwischenräume meist kleiner als die Punkte, zum Teil rugulos, Punktzwischenräume und Punktur lateral größer werdend; bei den Tieren aus Biak ist die mediale Halsschildpunktur auffallend fein, die Punktzwischenräume deutlich größer als die Punkte; Tomentierung hellbräunlich, die drei Basalstreifen immer nur undeutlich erkennbar oder fehlend, am deutlichsten bei den Tieren

aus Raja Ampat zu erkennen. Flügeldecken: braun; Punktreihen mit engstehender, kräftiger Punktur, Punkte nach hinten kleiner werdend, apikal erloschen; Zwischenräume gewölbt; Grundtomentierung bräunlich; Grundmakel meist weiß, selten gelblich oder rötlich tomentiert, zum Teil schwer erkennbar; Basalmakel meist rund, selten bei größeren Tieren (meist Weibchen) spitz nach hinten ausgezogen, Punktreihen an dieser Stelle oft gestört; Medialmakel 1 oft ebenso groß und rundlich; Medialmakel 2 meist deutlich davor liegend, bei einzelnen Weibchen von Halmahera und Yapen liegen beide Makel annähernd auf gleicher Höhe, eine weitere weiße oder bräunliche, oft undeutliche Makel im 8. Zwischenraum, etwas unterhalb der Schulter, diese bei Tieren von Halmahera am deutlichsten ausgebildet; die sichelförmige Apikalmakel meist deutlich ausgebildet, bei Tieren von Yapen und Biak kann diese Makel fehlen; Apikalmakel von gelblicher und weißlicher, selten auch rötlicher Tomentierung umgeben, diese oft bis zu den Medialmakel reichend; undeutliche gelbliche Tomentaufhellungen auch in der Umgebung des meist gelblich tomentierten, apikal abgerundeten Schildchens; Apex schräg abgestutzt, Innenecke abgerundet, Außenecke mehr oder weniger spitz ausgezogen, bei den Tieren von Halmahera dieser Auszug fingerförmig und relativ groß, bei einigen Tieren von Biak, Yapen und Raja Ampat der Auszug breiter zugespitzt und etwas nach außen geneigt. Beine: braun; Schenkel, Schienen und Tarsen „sybra"-typisch (siehe Weigel, Skale 2009); Tomentierung meist weißlich, heller als Flügeldeckentoment, seltener Mittel- und Vorderschenkel bräunlich tomentiert, Tomentierung der Schenkel oft mit einzelnen dunkleren Flecken durchsetzt. Unterseite Männchen: Mittelbrust dunkelbraun bis schwarz; Vorderbrust und Abdomen, vor allem die zwei letzten Sternite heller braun; Tomentierung schmutziggelb, in den Mittelbereichen locker, nach den Seiten deutlich dichter werdend; ein schmaler seitlicher Randbereich aller Sternite deutlich dichter tomentiert und bei frischen Tieren rosa gefärbt; Mittelbrust zentral unpunktiert und mit schmaler, glänzender Mittellängslinie, welche bis zum Mittelbrustfortsatz reicht und auf der hinteren Hälfte deutlich vertieft ist, seitlich mit deutlichen, locker stehenden Kahlpunkten besetzt; Mittelbrustfortsatz matt, basal mit einigen größeren Punkten, sonst unpunktiert, auffällig lang und abstehend behaart, apikal leicht dreieckig ausgeschnitten (durch dichte Behaarung oft schwer zu erkennen); Prosternalfortsatz matt, basal mit einzelnen gröberen Punkten besetzt und auffallend lang, gelblich behaart; letztes Sternit mit apikaler, gerundeter Ausbuchtung. Unterseite Weibchen: Prosternal- und Mittelbrustfortsatz nur kurz, anliegend behaart; letztes Sternit ohne apikalen Ausschnitt, mehr oder weniger gleichmäßig verrundet und mit deutlicher, fast über die gesamte Länge reichender Vertiefung; ansonsten mit der Unterseite der Männchen übereinstimmend. Aedeagus: ventrale Lobe apikal kurz zugespitzt und am Apex verrundet, in Lateralansicht apikal nur leicht nach hinten gebogen (Tafel 37, Abb. 4-5); dorsale Lobe von ähnlicher Form, gerade und kürzer; sehr ähnlich der *S. strigina*, aber der Apex meist etwas spitzer. Fibula (Tafel 40, Abb. 1-7, 9-10): 0,54-0,63 mm lang (nicht abhängig von der Größe des Tieres!), main piece in Ventralansicht zweiteilig, basal offen oder geschlossen, zur Basis gerundet oder eckig erweitert; in Lateralansicht wenig gebogen, basal kaum erweitert; die Basis auch innerhalb einer Population sehr variabel (Tafel 40, Abb. 2-7); Medialsack äußerst engmaschig strukturiert, dadurch etwas angedunkelt; Distallobus ventral mit breiter, relativ kurzer, wulstig gefalteter Basis, diese Falten apikal wulstig aufgebogen und dort deutlich dunkler, lateral und dorsal ohne wulstige Falten; Fibulaport ebenfalls wulstig gefaltet, apikal verschmälert, lateral von zwei kräftig chitinisierten, dornförmigen Fortsätzen begrenzt; Apicalappendices hyalin, aus zahlreichen, blasigen Schwellungen bestehend, in Ventralansicht medial immer durch eine annähernd gerade, glatte Fläche verbunden. Parameren (Tafel 40, Abb. 8): Apikalloben meist lateral geschwungen verengt, mit längerer Behaarung am Apex und oberhalb der breit verrundeten Erweiterung an der Basis, medial neben wenigen längeren Haaren nur mit kurzen, meist nach außen gerichteten Borsten besetzt. Genitaltergit: sehr variabel, oft innerhalb einer Population; trapezförmig; subapikal meist abgerundet, seltener mit angedeuteten Außenecken; am Vorderrand medial mit kleiner Ausbuchtung oder tief dreieckig ausgeschnitten, immer mit kräftiger, dunkler Behaarung.

Geschlechtsdimorphismus: Männchen oft kleiner und schlanker, mit längeren Fühlern und deutlich ausgeschnittenem letzten Sternit.

Differentialdiagnose: Von der sehr ähnlichen *S. subincana* Breuning morphologisch nur durch die im männlichen (und meist auch im weiblichen) Geschlecht kürzeren Fühler und dem kürzeren, kräftigeren Skapus verschieden; Fibula artspezifisch und am ehesten mit der von *S. strigina*

Pascoe zu verwechseln, diese im Durchschnitt allerdings größer, main piece kräftiger und in Lateralansicht basal immer deutlicher erweitert.

Ökologie: Die Art wird oft in anthropogen geprägten Bereichen (Plantagen, Gärten, Holzzäunen) gefunden, und sitzt hier meisten in oder an abgestorbenen Blättern. Die Tiere spreitzen im Klopfschirm ihre Vorderbeine nach vorn ab und verfallen kurzzeitig in Thantose. Aus frisch abgestorbenen Zweigen (Umgebung Kaimana und Yamor River) schlüpften am 19.06.2011 zwei Exemplare. Die Larven fressen zuerst unter der Rinde und gehen später ins Holz. Die Verpuppung erfolgt in einer ovalen Puppenwiege an der Holzoberfläche (pers. Mitt. von O. Mehl). Auf Batanta (West-Papua) wurden einige Exemplare von Kakao-Bäumen (*Theobroma cacao*), im Randbereich der Plantagen, geklopft.

Verbreitung: Es handelt sich um die am weitesten verbreitete und wohl auch häufigste Art der *Sybra incana*-Gruppe mit Vorkommen auf den Molukken, West-Papua und Papua Neuguinea.

***Sybra strigina* Pascoe, 1865** (Tafel 41, Abb. 1-6)
Sybra strigina Pascoe, 1865: 212
= *Ropica decemmaculata* Breuning, 1965: 178 (Weigel, Skale 2011)

Untersuchtes Typenmaterial:
Sybra strigina: Holotypus ♂ BMNH, Sybra strigina Pasc. Bouru [handschriftlich] / Pascoe Coll. 93-60 [gedruckt, auf Rückseite] // Type // strigina [handschriftlich] / Bou. [rundes, weißes Etikett, handschriftlich].
Zustand: Toment gut erhalten, vollständig, Größe: 10,5 mm.

Ropica decemmaculata: Holotypus ♀ ZMB, Ins. Key [gedruckt] // Sybra sp. Aur. [handschriftlich] // Holotypus [rot, gedruckt] // Ropica decemmaculata mihi Breuning det. Typ.
Zustand: Toment gut erhalten; linker Fühler mit 9 Gliedern, rechter Fühler mit 4 Gliedern; Klauenglied vorn links fehlt, Tarsenglieder Mitte links fehlen, hinten rechts nur ein Tarsenglied vorhanden, Größe: 8,5 mm.

Weiteres Material 37 Exx:
MOLUKKEN / KEI-INSELN: 18♂, 17♀ CMS, CSH & CWW, INDONESIA or. KEI-ISLANDS, 10km W Tual city, vic. Ohoidertawun vill., 10m, S5°37'13"/ E132°39'20", 17.-20.II.2011, IM, IS, IW (013); 1♀ HNHM, Kei Ins, Sybra patrua strigina Pasc. [handschriftlich], Breua[n] ing dèt., Sybra patrua strigina Pasc. [handschriftlich], det. Breuning 1952.
MOLUKKEN / SERAM: 1♀ CMS, MALUKU, Seram Solea, 12km S. of Wahai, 16/x-4/xi-1998, IM.

Diagnose: Größe Männchen: 7,8-10,7 mm, Weibchen: 8,3-11 mm. Kopf: dunkelbraun; Taster einfarbig braun, letztes Glied schmal, zugespitzt, deutlich länger als das vorletzte; Clypeus gerandet, leicht nach innen gewölbt; Stirn zwischen den Augen dicht punktiert, Zwischenräume meist wenig größer als Punktdurchmesser; schütter gelblich behaart, diese Behaarung nach innen gerichtet; zwischen den oberen Augenloben mit deutlicher Längsfurche; Schläfen ohne Punktierung, selten mit einzelnen Punkten und gelb tomentiert. Fühler: etwas länger als der Körper, beim Männchen wenig länger als beim Weibchen; Skapus walzenförmig, fast parallelseitig, medial nur wenig verbreitert, Oberflächenstruktur wie restliche Fühlerglieder; Glieder oben grau tomentiert, Glied 3 und 4 etwa gleich lang, die folgenden ab dem 5. Glied gleichmäßig kürzer werdend. Halsschild: Basis gerade, breiter als Vorderrand, mit subbasaler Vertiefung; Seiten gerundet, größte Breite hinter der Mitte (bei großen Exemplaren kann der Halsschild auch in Basisnähe am breitesten sein); Halsschildhinterecken in unmittelbarer Basisnähe mit einer eckigen, zahnartigen Erweiterung; Punktierung variabel, medial meist sehr dicht, Punktzwischenräume meist kleiner als die Punkte, selten aber auch mit einzelnen, zum Teil wulstähnlichen punktfreien Zwischenräumen, Punktzwischenräume zu den Seiten zu größer werdend; Tomentierung ockergelblich, mit drei Streifen, welche sich meist nur im Basalbereich deutlich abheben; bei frischen Tieren auch am Halsschildvorderrand mit verdichteter Tomentierung. Flügeldecken: braun; Punktreihen mit engstehender, kräftiger Punktur, Punkte nach hinten kleiner werdend und weiter auseinanderstehend, apikal oft erloschen; Zwischenräume leicht gewölbt; Grundtomentierung hellbräunlich bis gelblich; Grundmakel gelblich tomentiert (außer HT und bei dem Exemplar von der Insel Seram, hier weiß bzw gelb-weiß, siehe auch Weigel, Skale 2011); Basalmakel meist rund und relativ groß; Medialmakel 1 ebenso groß, rund bis oval, in seltenen Fällen als kurzer Längsstreifen ausgebildet; Medialmakel 2 immer deutlich davor liegend, meist kleiner, rund, selten etwas oval ausgezogen; bei der Basalmakel und der Medialmakel 1 die Punktreihen oft gestört, der Zwischenraum erweitert; bei einzelnen Exemplaren ist noch eine weitere Makel im zweiten Zwischenraum, zwischen Basalmakel und Medialmakeln vorhanden, diese jedoch nicht so deutlich wie die Grundmakel; desweiteren eine verdichtete Tomentierung jederseits des Schildchens; das Apikaldrittel kaum merklich aufgehellt (bei *S. biochreopunctipennis* deutlich weißlich aufgehellt), ohne sichelförmige Apikalmakel; Apex schräg abgestutzt, Außenecke oft leicht zugespitzt; Schildchen gelb tomentiert, apikal abgerundet. Beine: braun; Schenkel, Schienen und Tarsen „sybra"-typisch (siehe Weigel, Skale 2009); Tomentierung dicht, gleichförmig, wenig heller als Flügeldeckentoment. Unterseite Männchen: Mittelbrust dunkelbraun; die letzten vier Sternite zumindest basal aufgehellt; Tomentierung gelblich, in den Medialbereichen locker bis fehlend; Mittelbrust seitlich mit locker gestellten größeren Kahlpunkten, medial punktfrei und dicht, abstehend pelzartig behaart; Mittellängslinie deutlich und in der apikalen Hälfte vertieft; Mittelbrustfortsatz breit, matt, unpunktiert, lang abstehend behaart und apikal dreieckig ausgeschnitten; Prosternalfortsatz matt, lang abstehend gelblich behaart, bei großen Tieren zwischen den Vorderhüften wulstig aufgebogen; alle Trochanteren dicht behaart, mit zahlreichen längeren, abstehenden Haaren besetzt; letztes Sternit mit einem tiefen, dreieckigen Ausschnitt. Unterseite Weibchen: Mittelbrust dunkelbraun, Vorderbrust und Abdomen heller; Tomentierung gelblich, Sternite und Vorderbrust lateral dichter tomentiert; Mittelbrust medial unpunktiert, lateral zerstreut mit Kahlpunkten besetzt; Mittellängslinie bis zum Mittelbrustfortsatz reichend und in der apikalen Hälfte vertieft; Mittelbrust- und Prosternalfortsatz matt, unpunktiert und ohne längere Behaarung; letztes Sternit mit subbasaler, mehr oder weniger punktförmiger Vertiefung und apikal etwas abgestutzt verundet. Aedeagus: ventrale Lobe apikal kurz zugespitzt und am Apex verrundet, in Lateralansicht apikal nur leicht nach hinten gebogen (Apexform variabel, zum Teil größenabhängig); dorsale Lobe von ähnlicher Form und kürzer; sehr ähnlich *S. incana*, aber der Apex meist etwas breiter verrundet. Fibula: (Tafel 41, Abb. 6) 0,59-0,64 mm (HT), die Unterschiede zur der individuell stark variierenden Fibula von *Sybra incana* (Tafel 40, Abb. 1-7, 9-10) sind nur geringfügig und kaum zu differenzieren, es wird deshalb keine separate Abbildung aufgeführt. Parameren (Tafel 41, Abb. 5): Apikalloben meist lateral geschwungen verengt; längere Behaarung am Apex und oberhalb der breit verrundeten Erweiterung an der Basis, medial neben wenigen längeren Haaren nur mit kurzen, meist nach außen gerichteten Borsten besetzt. Genitaltergit: trapezförmig; subapikal mit angedeuteten Außenecken; Vorderrand medial mit kleiner Ausbuchtung und kräftiger, dunkler Behaarung.

Geschlechtsdimorphismus: Männchen meistens kleiner, mit etwas längeren Fühlern und deutlich ausgeschnittenem letzten Sternit, bei Exemplaren gleicher Größe haben die Männchen längere Hintertibien.

Differentialdiagnose: Sehr ähnlich der *S. biochreopunctipennis* Breuning von den Philippinen, jedoch mit etwas kräftigerem Skapus, unpunktierten Schläfen und ohne weiße Tomentierung im Apikaldrittel, das weibliche Exemplar von der Insel Seram jedoch mit angedeuteten Aufhellungen im Apikaldrittel. Im Verbreitungsgebiet mit einzelnen Exemplaren von *S. incana*, die keine sichelförmige Apikalmakel besitzen, zu verwechseln, diese jedoch immer mit weißen Grundmakeln und ohne auffällig gelb tomentiertes Schildchen (Vorsicht bei älteren, ausgeblichenen Tieren).

Verbreitung: Bisher nur von den zentralen und südlichen Molukken (Buru, Seram, Kei-Inseln) bekannt.

***Sybra subincana* Breuning, 1968** (Tafel 42, Abb. 1-6)

Sybra subincana Breuning, 1968: 704

Untersuchtes Typenmaterial:

Sybra subincana: Lectotype: ♀ MNHN [hiermit designiert,: W. Celebes / Biromaroe Paloe / J. P. Ch. Kalis 1937. // Sybra subincana mihi Typ / Breuning det. // MUSEUM PARIS / 1952 / COLL R OBERTHÜR // TYPE [rot, gedruckt] // LECTOTYPUS / SYBRA / subincana Breuning / des. A. Weigel 2007.

Zustand: Toment gut erhalten; beide Fühler mit 9 Gliedern, 2 Tarsenglieder Mitte rechts nur zwei Tarsenglied vorhanden, Größe: 9,1 mm.

Paralectotype: ♀ MNHN [hiermit designiert], gleiche Angaben wie Lectotypus.

Weiteres Material 21 Exx:

SULAWESI: 1♂, 1♀ SMNS, SULAWESI: Kotamobagu, Matalibaru > Torosik, Gn. Tongara, 9.XII.1999, 850-900m, IR; 1♀ BMNH, INDONESIA: SULAWESI UTARA, Dumoga-Bone N.P., November 1985, Plot B, ca 300m, Lowland forest, Malaise trap, R. Ent. Soc. Lond., PROJECT WALLACE B.M., 1985-10, 126.87; 2♂, 1♀ CSH & CWW, INDONESIA N-Sulawesi, 5 km SE Batu Putih, 250m, N 1°32'43", E 125°07'29", 18.II.2009, (002), IS, IW; 1♂, 1♀ BMNH, INDONESIA: SULAWESI UTARA, Dumoga-Bone N.P., July 1985, Fog 13 230m, 11.vii.85, BMNH Plot A, R. Ent. Soc. Lond., PROJECT WALLACE

B.M., 1985-10, TRAY 25, 203; 1♂ CWW, INDONESIA N-Sulawesi, 7km S Lolak, vic. Polili, 180m, N 0°48'65'', E124°01'23'', 22.II.2009, UWS (10a), IW; 3♂ CWW, INDONESIA N-Sulawesi, vic. Raja Basar b. Moutong, N 0°29'78'', E 121°12'99'', 28.II.2009,15m, riv. valley (16), IW; 2♀ CSH, INDONESIA C-Sulawesi, ca. 20km NE Palu, ca. 3[k]m W Tawaeli, 170m, S 0°43'56", E 119°55'30", 03.III.2009, river valley (020), IS; 6♂ CSH & CWW, INDONESIA C-Sulawesi ca. 20km NE Palu, ca. 5km W Tawaeli, 250m, S 0°43'45", E 119°55'95", 02.III.2009 (19), IS, IW; 1♀ CWW, INDONESIA Sulawesi, Lore Lindu-Nat.-Park, Kanorora 13.-18.IV.1994, leg. R. Gerstmeier.

Diagnose: Größe Männchen: 6,9-9,7 mm, Weibchen: 7,6-10 mm. Kopf: schwarz; Taster braun, letztes Glied schmal, zugespitzt, deutlich länger als das vorletzte und basal oft angedunkelt; Clypeus gerandet, gerade bis leicht nach innen gewölbt; Stirn zwischen den Augen variabel dicht punktiert, Zwischenräume meist wenig größer als Punktdurchmesser, mit schütterer, nach innen gerichteter gelblicher oder weißlicher Behaarung, zwischen den oberen Augenloben meist mit deutlicher Längsfurche, diese kann sehr undeutlich sein und in seltenen Fällen fehlen; Schläfen deutlich, relativ dicht punktiert und wie der übrige Kopf tomentiert. Fühler: in beiden Geschlechtern deutlich länger als der Körper, beim Männchen überragen die letzten 3-4 Glieder, beim Weibchen die letzten 1-2 Glieder die Flügeldecken; Skapus walzenförmig, schlank, fast parallelseitig, medial nur wenig verbreitert; Oberflächenstruktur wie restliche Fühlerglieder, oben gräulich tomentiert; 3. Glied wenig kürzer als das 4. Glied, die folgenden gleichmäßig kürzer werdend, das letzte deutlich kürzer als das 10. Glied. Halsschild: trapezförmig; größte Breite in Basisnähe; Basis gerade, breiter als Vorderrand, mit deutlicher, subbasaler Vertiefung; Punktierung kräftig und eng stehend, vor allem medial zum Teil rugulos, meist nur am Vorderrand mit größeren Zwischenräumen; Tomentierung gelblich, mit unregelmäßigen Tomentverdichtungen. Flügeldecken: dunkelbraun bis schwarz; Punktreihen mit engstehender, kräftiger Punktur, Punkte nach hinten kleiner werdend und weiter auseinanderstehend; Zwischenräume leicht gewölbt, apikal ohne Punktreihen und meist glatt; Grundtomentierung fleckig, hellbräunlich bis gelblich, selten weißlich; Grundmakel weiß, selten etwas gelblich tomentiert; Basalmakel rund und mäßig groß, Punktreihe selten gestört; Medialmakel 1 kleiner, zum Teil schwer sichtbar oder fehlend, selten nur auf einer Seite erkennbar; Medialmakel 2 oft undeutlich oder fehlend, meist wenig hinter Medialmakel 1 liegend; bei zwei Exemplaren aus Palu davor gelegen; die dunkle, sichelförmige Apikalmakel immer deutlich, selten der gesamte Apex dunkel, davor zum Teil schmal weißlich oder gelblich aufgehellt; Schildchen wie der Halsschild gelblich tomentiert, apikal abgerundet. Beine: braun, Schenkel, Schienen und Tarsen „sybra"-typisch (siehe Weigel, Skale 2009), Tomentierung mäßig dicht, gleichförmig, farblich wie Flügeldeckentoment. Unterseite Männchen: Mittelbrust dunkelbraun bis schwarz; Vorderbrust und Abdomen etwas heller; Tomentierung weißlich, in den Mittelbereichen locker bis fehlend, zu den Seiten dichter werdend; Mittelbrust nur an den Seiten mit locker gestellten größeren Kahlpunkten; Mittellängslinie nur in der apikalen Hälfte deutlich und leicht vertieft; Mittelbrustfortsatz matt, nur basal mit größeren Punkten besetzt und lang abstehend behaart; apikal seicht gerundet ausgeschnitten; Prosternalfortsatz matt, mit groben Punkten besetzt und lang abstehend gelblich behaart; Unterseite der Mittelschenkel einschließlich Trochanteren mit starren, abstehenden weißen Haaren besetzt; Trochanteren der Vorderschenkel ebenfalls mit langen, nach vorn gerichteten Haaren besetzt; letztes Sternit medial mit seichtem Ausschnitt. Unterseite Weibchen: Prosternalfortsatz wie beim Männchen, allerdings die abstehende Behaarung etwas kürzer; ohne auffällige Behaarung der Mittelschenkel und Trochanteren; letztes Sternit subbasal mit kleiner, punktförmiger Vertiefung und ohne Ausschnitt, diese Vertiefung deutlich kleiner als bei *S. incana*; ansonsten mit der Unterseite der Männchen übereinstimmend. Aedeagus (Tafel 37, Abb. 6): ventrale Lobe schon ab dem apikalen Drittel zugespitzt, am Apex immer spitz auslaufend, in Lateralansicht apikal stark nach hinten gebogen; dorsale Lobe von ähnlicher Form, aber kürzer. Fibula (Tafel 42, Abb. 3-6): 0,52-0,61 mm; main piece einteilig, basal ventralwärts kräftig erweitert, Erweiterung in Ventralansicht breit, meist V-förmig, zum Teil aber mit leicht gerundeten Seiten und dann annähernd U-förmig; in Lateralansicht basal stark eckig erweitert; Medialsack äußerst engmaschig strukturiert, leicht angedunkelt; Distallobus in Ventralansicht basal fast gerade, medial nur wenig ausgebuchtet, die stark wulstigen Falten lateral fast gerade, auch medial nur wenig gewellt; in Lateral- und Dorsalansicht basal mit kräftigen Falten; Fibulaport hyalin und ohne Strukturen; Apicalappendices hyalin und aus blasigen Schwellungen bestehend, gerade zur Längsachse verlaufend, medial miteinander verbunden, in Lateralansicht mit deutlichem, basalwärts gerichtetem Fortsatz. Parameren (Tafel 42, Abb. 2): Apikalloben auf der Außenseite seicht geschwungen, apikal mäßig lang behaart, oberhalb der verrundeten Erweiterung an der Basis ebenfalls mit längeren Haaren besetzt; medial neben wenigen längeren Haaren nur mit kurzen, meist nach außen gerichteten Borsten besetzt. Genitaltergit: trapezförmig, subapikal seicht abgerundet, seltener mit angedeuteten Außenecken, Vorderrand medial mit kleiner Ausbuchtung und kräftiger, dunkler Behaarung.

Geschlechtsdimorphismus: Männchen schlanker, mit längeren Fühlern und ohne punktförmiger Vertiefung im letzten Sternit.

Differentialdiagnose: Der *S. arator* Pascoe ähnlich, von dieser morphologisch durch einfarbig tomentiertes Halsschild und etwas dichtere Halsschildpunktur verschieden. Die Fühler im männlichen Geschlecht deutlich länger als bei *S. arator*. Von *S. incana* (Pascoe) vor allem durch die im männlichen Geschlecht deutlich längeren Fühler und dem schlankeren Skapus verschieden (bei Tieren von gleicher Größe!). Genitalmorphologisch durch die V-förmige Basis der Fibula von allen Arten der *Sybra incana* Gruppe deutlich zu differenzieren.

Verbreitung: Bisher nur von Sulawesi bekannt und hier vermutlich endemisch.

***Sybra yokoi* sp. nov.** (Tafel 43, Abb. 1-10)

Holotypus ♂ NME, Bumbugan / Jembrana W. Bali / Indonesia / 14.-15.Nov. 2005 / leg. Y. Yokoi.

Paratypen 16 Exx: 1♂, 5♀ CSH & CYR, gleiche Daten wie HT; 1♀ CYR, Bumbugan / Jembrana W. Bali / Indonesia / 22.Nov. 2005 / leg. Y. Yokoi; 1♂, 3♀ CYR, Bumbugan / Jembrana W. Bali / Indonesia / 11.April 2005 / leg. Y. Yokoi; 1♂, 4♀ CWW & CYR, Tungpan / West Bali Indonesia / 10.April 2005 / leg. Y. Yokoi; 1♂ CYR, Gunung Prada / Jembrana Bali / Indonesia / 17.-18. Apr. 2005 / Y. Yokoi.

Derivatio nominis: Patronymisch. Die neue Art wird nach ihrem Entdecker, unseren verehrten Kollegen und Bockkäferspezialisten Yaheita Yokoi benannt.

Diagnose: Größe HT: 9,8 mm, PT: Männchen: 7,9-11 mm, Weibchen: 9,1-10,5 mm. Kopf: dunkelbraun; Taster einfarbig rötlichbraun oder basal angedunkelt, letztes Glied schmal, zugespitzt, deutlich länger als das vorletzte; Clypeus gerandet, leicht nach innen gewölbt; Stirnpunktierung zwischen den Augen variabel, meist mäßig dicht punktiert, Zwischenräume zum Teil zwei- bis dreimal so groß wie Punktdurchmesser, selten so groß wie diese; von den oberen Augenloben bis zum Clypeus mit mehr oder weniger deutlicher Längsfurche, diese selten medial endend; Tomentierung meist gelblich, seltener weißlich und zwischen den Augen deutlich nach innen gerichtet; Schläfen immer deutlich punktiert und gelblich tomentiert. Fühler: Fühlerlänge variabel, beim Männchen 1 oder 2 Fühlerglieder die Flügeldecken überragend, beim Weibchen meist mit den Flügeldecken endend, selten diese um etwa ein Fühlerglied überragend; Skapus walzenförmig, annähernd parallel, medial kaum verbreitert, Oberflächenstruktur wie restliche Fühlerglieder; oben gräulich tomentiert, basal aufgehellt; Fühlerglied 3 und 4 annähernd gleichlang, die folgenden gleichmäßig kürzer werdend. Halsschild: Basis gerade, wenig breiter als Vorderrand, nur wenig breiter als lang; hinter einer schmalen, unpunktierten Basis mit deutlicher, subbasaler Vertiefung; Seiten mehr oder weniger gerundet, größte Breite etwa in der Mitte; Punktierung variabel, Punktzwischenräume meist etwa gleich den Punktdurchmessern, zum Teil aber auch deutlich größer; Punktdurchmesser lateral kaum größer werdend, meist nur in der Nähe der Hinterecken wenige gröbere Punkte als im Medialbereich; Tomentierung gelblich und fleckig, immer mit einem auffälligen, meist länglichen, gelben Tomentfleck in der subbasalen Vertiefung gegenüber dem Schildchen. Flügeldecken: braun, Punktreihen mit engstehender, kräftiger Punktur, Punkte nach hinten kleiner werdend, apikal erloschen; Zwischenräume leicht gewölbt; Grundtomentierung gelblichgrau; Grundmakel gelb tomentiert; Basalmakel rund, meist nach unten spitz ausgezogen und den gesamten Zwischenraum einnehmend, die Punktreihe an dieser Stelle selten verbreitert; Medialmakel 1 von gleicher Form, aber immer kleiner; Medialmakel 2 sehr klein, meist nur angedeutet, selten ganz fehlend, immer vor Medialmakel 1 liegend; der 2. Zwischenraum basal mit verdichteter Tomentierung; die schwarze, sichelförmige Apikalmakel immer deutlich ausgeprägt und mit kräftiger, gelblicher Tomentierung umgeben; beim Weibchen meist mit ausgedehnterer Apikalmakel, oft ist sogar der gesamte Apex schwarz (Tafel 43, Abb. 3); Apex schräg abgestutzt, Außenecke wenig spitz ausgezogen; Schildchen gelblich tomentiert, apikal abgerundet. Beine: braun; Schenkel, Schienen und Tarsen „sybra“-typisch (siehe Weigel, Skale 2009); Tomentierung mäßig dicht, meist weißlich, selten gelblich, die gelbliche Tomentierung zum Teil nur auf ein Beinpaar beschränkt, machmal fleckig erscheinend. Unterseite Männchen: Mittelbrust schwarz; Vorderbrust und Abdomen dunkelbraun; Tomentierung gelblich; auf der Mittelbrust ziemlich gleichmäßig verteilt, auf dem Abdomen zwei Reihen mit ringförmig verdichteter Tomentierung; auf dem ersten Sternit basal mit zwei größeren Tomentflecken; ein schmaler lateraler Bereich aller Sternite und das letzte Sternit meist mit zusätzlicher rötlicher Tomentierung; Mittelbrust seitlich locker und mäßig kräftig punktiert, zentral unpunktiert, mit deutlicher, etwas vertiefter Mittellängslinie in der apikalen Hälfte; Mittelbrustfortsatz matt, auch basal unpunktiert und ohne längere Behaarung; apikal fast gerade endend; Prosternalfortsatz matt, zwischen den Vorderhüften auffällig kräftig punktiert und neben der normalen Tomentierung mit einzelnen längeren Haaren besetzt; letztes Sternit apikal tief dreieckig ausgeschnitten. Unterseite Weibchen: letztes Sternit medial mit mehr oder weniger länglicher Vertiefung; in Basisnähe mit deutlicher grubenförmiger Vertiefung und apikal ohne Ausschnitt; ansonsten identisch mit Männchen. Aedeagus: ventrale Lobe apikal zugespitzt, leicht nach hinten gebogen; dorsale Lobe kürzer; Innensack (wie bei allen der hier behandelten Arten) auf der Oberfläche mit kleinen, runden und dicht stehenden Noben (Tafel 43, Abb. 11). Fibula (Tafel 43, Abb. 4-7): 0,60-0,63 mm; main piece einteilig, basal ventralwärts erweitert, Erweiterung in Ventralansicht sehr schmal, flach U-förmig; main piece in Lateralansicht basal gerundet erweitert; Medialsack äußerst engmaschig strukturiert, leicht angedunkelt; Distallobus ventral mit breiter, lateral stark rundlich verbreiteter Basis, die stark wulstigen Falten lateral fast gerade, medial stark gewellt, in Lateral- und Dorsalansicht mit kräftigen, meist geraden Falten; Fibulaport hyalin, mit schwer sichtbaren Strukturen, in Lateralansicht nicht vorstehend; Apikalappendices hyalin und aus sehr kleinen, blasigen Schwellungen bestehend, in Ventralansicht gerade zur Längsachse verlaufend, basal miteinander verbunden, apikal leicht zugespitzt, in Lateralansicht annähernd eiförmig. Parameren (Tafel 43, Abb. 7): Apikalloben lateral leicht S-förmig geschwungen verengt; längere Behaarung am Apex (ventral und dorsal) und oberhalb der schmal verrundeten Erweiterung an der Basis; medial meist nur mit kurzen Borsten besetzt. Genitaltergit: trapezförmig, subapikal gleichmäßig verrundet, ohne angedeutete Außenecken; Vorderrand medial mit seichter Ausbuchtung und kräftiger, zum Teil dunkler Behaarung.

Geschlechtsdimorphismus: Männchen mit längeren Fühlern; Weibchen oft mit deutlich dunkler gefärbtem Flügeldeckenapex; Unterschiede in der Körperform, welche bei den Arten der *Sybra incana*-Gruppe oft auftreten, fehlen bei dieser Art.

Differentialdiagnose: Von der ähnlichen *S. incana* (Pascoe) durch gelbe Grundmakel und bei gleicher Größe deutlich schlankeren Halsschild unterschieden; von *S. strigina* Pascoe durch die stets vorhandene, deutliche Apikalmakel sicher zu trennen.

Verbreitung: Bisher nur von Insel Bali (Indonesien) bekannt.

Bestimmungsschlüssel für die Arten der *Sybra incana* Gruppe (ohne Philippinen)

1 Arten östlich der Wallace-Linie verbreitet 2
- Arten westlich der Wallace-Linie verbreitet 4
2 Grundmakel auffällig groß und gelb, Flügeldecken ohne deutliche, sichelförmige Apikalmakel .... *S. strigina*
- Grundmakel kleiner und weiß, Flügeldecken mit schwarzer, sichelförmiger Apikalmakel (diese fehlt nur bei einzelnen Tieren von *S. incana*) 3
3 Männchen mit längeren Fühlern und schlankerem Skapus, Art von Sulawesi .... *S. subincana*
- Weit verbreitete und häufige Art von den Molukken, Neuguinea und benachbarten Inseln .... *S. incana*
4 Grundmakel gelb, Art von Bali .... *S. yokoi* sp. nov.
- Grundmakel weiß, Lateralstreifen des Halsschildes schräg, Art von West-Malaysia und Sumatra .... *S. arator*

Identification key to species of *Sybra incana* group (Philippine Islands excluded)

1 Species occur eastwards of the Wallace's Line 2
- Species occur westwards of the Wallace's Line 4
2 Main maculae conspicuous large and yellow, elytral apex without a falciform spot .... *S. strigina*

- Main maculae smaller and white; elytral apex with a black falciform spot (absent only by certain specimens of *S. incana*) 3
3 Species from Sulawesi; male with longer antennae and slender scapus .... *S. subincana*
- Common and widespread species from the Moluccas, New Guinea and neighbouring islands .... *S. incana*
4 Main maculae yellow, species from Bali .... *S. yokoi* sp. nov.
- Main maculae white, lateral stripes of pronotum oblique, species from western Malaysia and Sumatra .. *S. arator*

Danksagung

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Taxonomic revision of the genus *Sapintus* Casey, 1895 (Coleoptera: Anthicidae: Anthicinae) from the Indo-Australian transition zone, with remarks on some Oriental and Australian taxa

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Abstract: Species of *Sapintus* Casey, 1895 from Wallacea and the Papuan region were revised. Thirty one species confirmed for the study area. Ten species new to science are described and illustrated, namely *Sapintus* (s. str.) *airi* sp. nov. (Solomon Islands), *S.* (s. str.) *celeripes* sp. nov. (W New Guinea), *S.* (s. str.) *curvitibia* sp. nov. (Solomon Islands), *S.* (s. str.) *densepunctatus* sp. nov. (W New Guinea), *S.* (s. str.) *geminus* sp. nov. (Papua New Guinea), *S.* (s. str.) *gemitus* sp. nov. (Sulawesi), *S.* (s. str.) *macrops* sp. nov. (W New Guinea), *S.* (s. str.) *malut* sp. nov. (North Moluccas), *S.* (s. str.) *monstrosiantennatus* sp. nov. (Sulawesi), and *S.* (s. str.) *sexualis* sp. nov. (W New Guinea). Redescriptions of another 21 species are given. Thirteen new combinations and 12 new synonymy are proposed. One revised status and two new names are proposed. Seven lectotype designations are made. An identification keys to species of *Sapintus* Casey, 1895 of the study area and an annotated species list are presented. Biogeographical peculiarities of *Sapintus* Casey, 1895 in the Indo-Australian transition zone are discussed for the first time. Ecological and bionomical observations are analysed. Possible mimicry cases among *Sapintus* and other beetle families (Cleridae, Chrysomelidae) were discussed. Additionally, eight species new to science from the Oriental region are described and illustrated, namely *S. andreaskopetzi* sp. nov. (Nepal), *S. angulapex* sp. nov. (The Philippines: Palawan), *S. curvatus* sp. nov. (Thailand), *S. echinatus* sp. nov. (Indonesian Borneo), *S. gracilentus* sp. nov. (Vietnam), *S. hartmanni* sp. nov. (Nepal), *S. lao* sp. nov. (Laos), and *S. vietnamensis* sp. nov. (Vietnam).

Key words: Coleoptera, Anthicidae, Anthicinae, *Sapintus*, Wallacea, Papuan region, Sulawesi, the Moluccas, Raja Ampat, New Guinea, Solomon Islands, biodiversity, taxonomy, biogeography, new species, identification key, mimicry, adaptive colouration, checklist.

Introduction

Almost all the main groups of the Anthicidae from the Indo-Australian transition zone have been revised during the last eight years (Telnov 2006a, 2007a & b, 2011a & b, 2012); the genus *Sapintus* Casey is the only remaining species-rich group not to have been subjected to taxonomic-biogeographical revision. *Sapintus* Casey, 1895 is a diverse and large genus of Anthicini (Anthicinae) with cosmopolitan distribution and over 175 recent species worldwide (no fossil records are hitherto known for this genus). Tropical areas of Oriental and Afrotropical chorons are where most of *Sapintus* species were recorded. Nearctic, Neotropical and Australian faunas seem less diverse (or have been researched less), but they still host several dozens of *Sapintus* species each. One subgenus is defined within this genus – *Barbigerosapintus* Telnov, 1998, which is distributed throughout tropical Asia as far as the Philippines, but not reaching the Indo-Australian transition zone.

Species of *Sapintus* demonstrate general uniformity in external morphology and body colouration. About 2/3 of all *Sapintus* species were originally described by Maurice Pic. As most entomologists know, these descriptions and his diagnoses of new taxa too insufficient and contain no information or figures about the genital organs which are an essential characteristic in defining new taxa. Large number of Pic's types stored at the MNHN have for a long time remained unattainable to anthicidologists; some of these types are now missing (destroyed or lost). Many of older descriptions could easily apply to several species at least. All the aforementioned facts were a cause for common confusions made by earlier authors – numerous synonyms have been established and only few specimens of *Sapintus* have been identified correctly subsequent to the original descriptions of these species.

Very few successful examples of taxonomical revisions of *Sapintus* species are known. Bonadona (1958) presented a good review of Madagascan species. Werner (1962, 1983) successfully revised Nearctic and Neotropical species and also noted the importance of male genitalia for proper identification of specimens. Werner and Chandler (1995) did good work on New Zealand fauna of Anthicidae. On the other hand, an attempt by Uhmann in 2007 to compile Anthicidae fauna of Australia was unsuccessful and made little sense since this author did not study type material of most of Australian species, and also failed to consider genital organs for treating species (Telnov 2011b).

In this publication I follow the concept by Bonadona (1958) who broaden the definition of *Sapintus* compared to Werner (1962, 1983). The present study aims to describe results of long-term taxonomically-faunistic and ecological investigation on the genus *Sapintus* in the Indo-Australian biogeographical transition zone - the Wallacea, New Guinea and the Solomon Islands, as well as to give preliminary biogeographical analysis of all species. In total, there are 31 species confirmed for the study area. Six informal species-groups are established. Descriptions of 10 new species are given. 13 new combinations are proposed, seven lectotypes are designated. Original identification key to species of *Sapintus* in the study area as well as an annotated checklist are presented. Available ecological data are summarized. For some reason, redescriptions and descriptions of some Oriental species of *Sapintus* are also given.

Generally, *Sapintus* s. str. is large and quite uniform group of the Anthicidae especially diverse in Oriental and Afrotropical chorons. Many species are very insufficiently described and are now hardly recognizable.

Material and methods

Over 400 specimens of *Sapintus* from the Indo-Australian transition zone and adjacent areas were morphologically and anatomically studied. Type specimens of all previously known species and subspecific taxa of *Sapintus* from Australia, Indonesia, Malaysia, Micronesian islands, New Caledonia, Papua New Guinea, and the Philippines were investigated (except for the two most common species, *S. plectilis* (Pic) and *S. oceanicus* (LaFerté-Sénectère)). The material studied come from various scientific collections across Europe, U.S.A., Asia and Australia. A significant part of the material has been collected by the author during several expeditions to remote parts of the Moluccas, Raja Ampat Islands and New Guinea. The specimens under study are all mounted on paper slides. In average, over 60% of all examples were dissected and their genital organs were investigated. Within large series of specimens, merely random dissection has been performed. Genital organs were mounted on microscopic slides and fixed in Apáthy's gum-syrup to make the objects permanent. For morphological studies, a Leica S6D binocular stereomicroscope with attached external Canon EOS 450D SLR camera was used. Genital organs were studied and photographed using a Meji optical microscope with attached external digital camera for imaging.

Acronyms for scientific collections:

BMNH – The Natural History Museum (British Museum, Natural History), London, U.K.;
HMNH – Hungarian National Museum of Natural History, Budapest, Hungary;
IRSN – Institut royal des Sciences naturelles de Belgique, Brussel, Belgium;
MNHN – Muséum National d'histoire naturelle, Paris, France;
MSNG – Museo Civico di Storia Naturale 'Giacomo Doria', Genova, Italy;
NHMW – Naturhistorisches Museum Wien, Austria;
MHUB – Museum für Naturkunde der Humboldt-Universität zu Berlin, Germany;
NHMB – Naturhistorisches Museum Basel, Switzerland;
NHRS – Naturhistoriska Riksmuseet, Stockholm, Sweden;
NME – Naturkundemuseum Erfurt, Germany (here also specimens collected by A.Skale & A.Weigel does belong);
NMNZ – Museum of New Zealand, Wellington, New Zealand;
OUNH – Oxford University Museum of Natural History, U.K.;
RMNH – Nationaal natuurhistorisch Museum (Naturalis), Leiden, The Netherlands;
SDEI – Senckenberg Deutsches Entomologisches Institut, Eberswalde, Germany;
SMNS – Staatliches Museum für Naturkunde Stuttgart, Germany;
ZIN – Zoological Institute, Russian Academy of Sciences, St.-Petersburg, Russia;
ZMUC – Zoological Museum, University of Copenhagen, Denmark;
ZSM – Zoologische Staatssammlung München, Germany;

DCC – Collection Donald S. Chandler, Durham, U.S.A.;
DTC – Collection Dmitry Telnov, Rīga, Latvia;
PAC – Collection Paul Aston, Hong Kong, China;
SKC – Collection Sergey Kurbatov, Moscow, Russia.

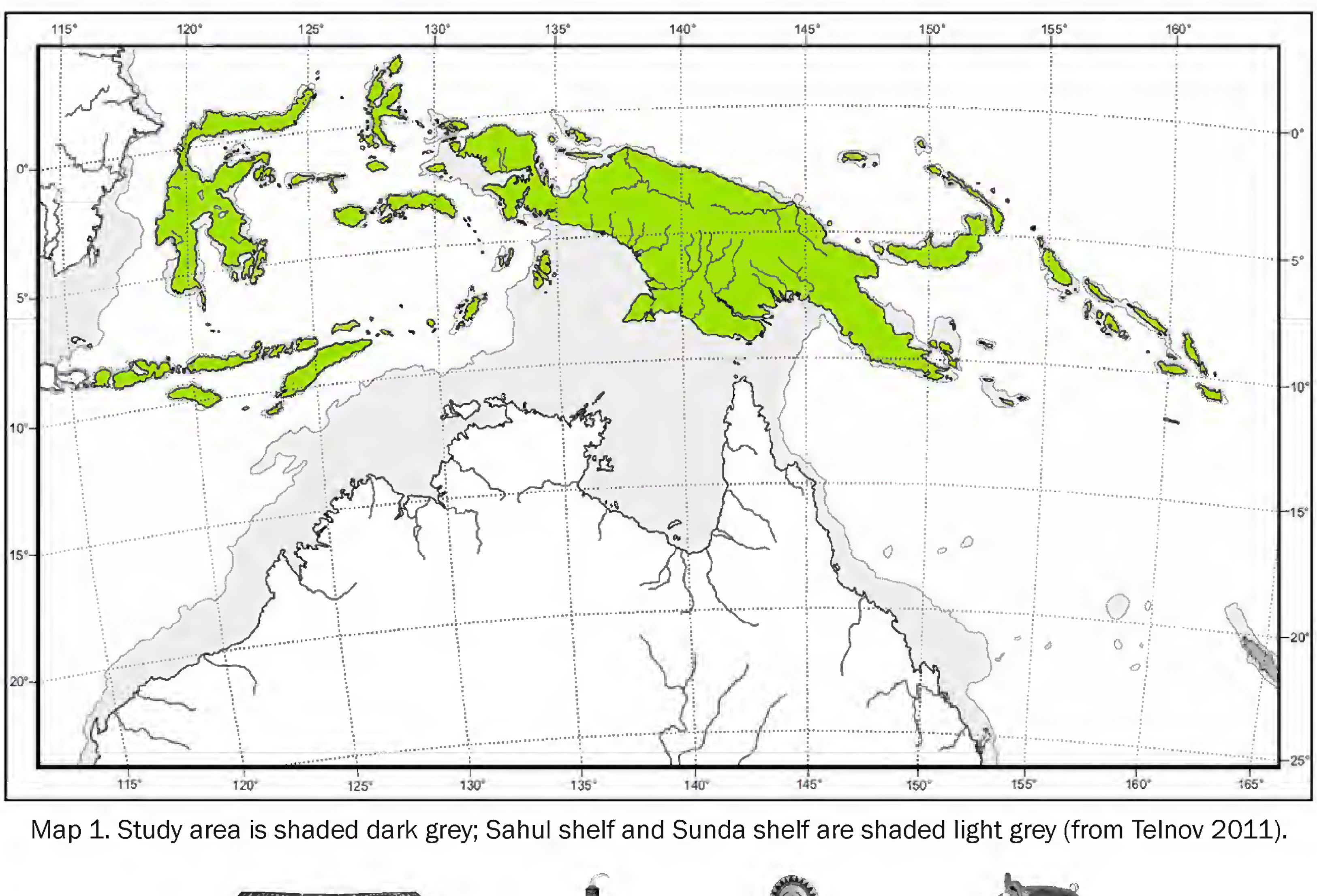
The study area (Map 1) extends over a large territory of ~4.800 km from Sulawesi and Lombok on the West to the Solomon Islands on the East. The study area further included the following insular systems and large islands: the classic Wallacea (inclusive Sulawesi, the Moluccas, Lesser Sunda Islands, Timor, Tanimbar Islands, Banda Islands and Kei Islands), Raja Ampat Islands (inclusive Batanta, Kofiau, Misool, Salawati and Waigeo), New Guinea with satellite islands (Aru Islands, Cenderawasih Bay islands of Biak, Numfor and Yapen, Bismarck and Admiralty archipelagos, as well as Louisiade Archipelago and D'Entrecasteaux Islands), and the Solomon Islands. Species of *Sapintus* from adjacent territories as for example Greater Sunda Islands, Peninsular Malaysia, the Philippines, Australia, New Caledonia and Micronesia (further mentioned as 'neighbouring areas') were also studied and revised. Taxonomic & biogeographical data of *Sapintus* from these neighbouring areas will be the subject of further publications.

For more convenient use and because a phylogenetic arrangement is not yet possible, all species-groups and species are listed alphabetically. All label text is reproduced exactly, with no corrections or additions. All labels are printed unless otherwise stated. The author's comments are placed in square brackets [ ]. Already published localities referred to are given in quotation marks; the corresponding reference always follows the quote. If not stated otherwise, all examples mentioned in this publication can be proved by the author. All type specimens of new species described in the present publication are provided with an additional black-bordered label printed in red 'Holotypus' or 'Paratypus'. Consequently, lecto- and paralectotype specimens designated below are provided with the additional labels 'Lectotypus' or 'Paralectotypus'.

Last visible ventrites (last fully exposed terminal tergite and sternite) discussed by each species' description are the morphological sternite & tergite VII. The omoplates and postbasal transverse impression of the elytra are usually not mentioned if they are vague indicated as is typical for this genus.

Historical overview

The genus *Sapintus* was first proposed by Casey in 1895 for ten Nearctic species. A type species was not been originally proposed but was later designated by Werner (1962). For a long time *Sapintus was* considered an element of the



Map 1. Study area is shaded dark grey; Sahul shelf and Sunda shelf are shaded light grey (from Telnov 2011).

American fauna until Bonadona (1958) expanded the generic definition by Casey, included numerous Afrotropical and Oriental species in it and suggested a possible Gondwanan origin of *Sapintus*. Subsequently over 150 species have been included or described in *Sapintus* by numerous authors, mostly split in short separate papers.

The taxonomically-faunistic (zoological) exploration of *Sapintus* in the Indo-Australian transition zone has been recorded continuously for a long time. But these efforts are poorly differentiated and mostly represented by original descriptions and only a few faunistic publications, as well as one single outdated checklist.

Almost all previously published descriptions of *Sapintus* species from the study area are based on material collected by few zoological and zoogeographical expeditions. These expeditions are chronographically listed below:

Expeditions by Alfred Russel Wallace and his assistant Charles Allen 1856-61 visited Sulawesi, the Moluccas, and Raja Ampat Islands, Aru and Kei islands, as well as coastal areas of Bird's Head Peninsula of New Guinea. Wallace's material, usually very comprehensive on various groups of Coleoptera, does not include a single specimen of *Sapintus*. However his expeditions are of such great importance that it is worth mentioning them.

Luigi Maria d'Albertis 1871-78 carried out several expeditions to the northern Bird's Head Peninsula and to the southern lowlands, and also went up the Fly River (Capocaccia, Poggi 1982).

Lamberto Loria collected material in eastern parts of New Guinea 1889-94. He visited Papuan Peninsula, Milne Bay islands, as well as coastal territories of Astrolabe Bay and Gulf of Papua (Capocaccia, Poggi 1982).

Lajos Biró travelled along the coast of German New Guinea 1896-1904 and successfully collected several species of *Sapintus*.

J.O. Bürgers 1912-13 was a doctor and also zoological collector of the 'Kaiserin-Augusta-Fluß Expedition'. During this important expedition, the valley of River Sepik and its tributaries were explored both geographically and zoologically.

Bernhard C.E. Rensch was one of only a few invertebrate specialists who visited Lesser Sunda Islands with the zoological expedition in 1927. Amongst the copious material collected on Sumbawa Island there were also few specimens of *Sapintus*.

Expedition 'Noona Dan' performed by the Zoological Museum University of Copenhagen (Denmark) 1961-1962. The only zoological expedition visited Bismarck Archipelago and collected *Sapintus* specimens.

Important material was collected on the Solomon Islands by entomologists and naturalists Penelope Jean Macleod Greenslade and Philip John Marsh Greenslade (both actively collected material on the Solomon Islands in 1960-70), also Peter Nolan Lawrence (participant of the Royal Society Solomon Islands Expedition) and in Papua New Guinea by Mick E.Bacchus. Very rich Anthicidae material is also available from two long-term international projects - 'Project Wallace' of the BMNH in northern Sulawesi (Bogani Nani Wartabone National park) and 'Canopy Mission' of the IRSN in Madang province of Papua New Guinea. A lot of new and interesting ecological data was collected during these two projects, employing different collecting techniques.

The first species nowadays known as *Sapintus* from the Indo-Australian transition zone was described from Sumbawa by Maurice Pic (1895). Later, he (Pic 1900) followed with 12 Papuan taxa described from the collection of MSNG in Genova (L. Loria's and L.M. d'Albertis's collected specimens) and two years later three new Papuan taxa collected by L.Biró were added (Pic 1902). All these taxa were originally placed in *Anthicus* Paykull, the largest and highly diverse genus of Anthicidae. Pic (1911) also published a single hitherto outdated catalogue of worldwide anthicids including the (at that time) known taxa from the Indo-Australian transition zone, i.e. 15 species with two subspecies. Bonadona (1981) described three new species from Bismarck Archipelago from material collected by 'Noona Dan' expedition. Uhmann (1995a) added one more Papuan species. Werner's (1965) account and key to Anthicidae of Micronesia does not overlap with our study area, but is important enough to be mentioned, as some species are shared between two areas; four species of *Sapintus* are described in this publication.

Totally, 17 taxa of *Sapintus* were recorded from the study area prior to the start of the current research.

Systematics

Subfamilia **Anthicinae** Latreille, 1819
Tribus **Anthicini** Latreille, 1819
Genus ***Sapintus*** Casey, 1895: 732
Subgenus ***Sapintus*** sensu stricto Casey, 1895: 732
Type species: *Anthicus pubescens* LaFerté-Sénectère, 1849a: 76, subsequent designation by Werner 1962: 493

Subgenus ***Barbigerosapintus*** Telnov, 1998: 88
Type species: *Sapintus confertopunctatus* Telnov, 1998: 90, original designation by Telnov 1998: 88.

Morphology and anatomy of *Sapintus*

Appearance: Body small, of typical Anthicini shape, 2-5.5 mm long. Dorsal surface (with some exceptions) uniformly black, brown or pale brown, often with yellow or black markings on elytra. Dorsal surface usually densely punctured and covered by numerous suberect to erect setae. Elytra in most species with double pubescence consist from a layer of short appressed undersetae (directed obliquely laterally in most species) arising from tiny punctures and a layer of longer sub- to erect oversetae arising from distinct macropunctures (pores).

Head midsized to large, on base rounded, subtruncate or truncate. Frontoclypeal sulcus present in form of thin line. Eyes small to large, more or less prominent, with clearly visible intrafacetal setae. Maxillary palps with 2nd palpomere elongate, 3rd palpomere shortened and angulated on mesal margin, terminal palpomere oblique apically, widest at middle. Antennae short to long, in certain species with intermediary antennomeres modified – enlarged, angulated or strongly shortened (modifications in males only; if also present in females, than these are usually less distinct). Terminal antennomere usually asymmetrical, longer than or as long as penultimate one.

Pronotum comparatively small, in most species narrower than head, short in New World species, short to elongate in Old World and Australian species, more or less strongly converged laterally toward narrower base (in some species distinctly narrowed posterior to middle, in other species almost as wide on anterior as on basal margin). Pronotal disc flattened to slightly convex. Apical collar always presented. Basal transverse sulcus angled anteriorly at lateral margins.

Elytra elongate, rarely widened on sides. Omoplates and postbasal transverse impression feebly indicated. Sutural striae present, complete or reduced to apical part of elytra. Punctures always confused, but indistinct rows of punctures adjacent to suture extending from scutellum and can reach to apex. Dorsal pubescence (with few exceptions) double and consists of short and dense appressed undersetae (in many species directed obliquely laterally) and longer suberect or erect oversetae. Micropunctures are often very poorly visible even under magnification of 60x.

Underside usually of same colouration like on dorsum. The mesosternum is simple. Lateral margins of mesosternum nearly straight, with a weak lateral curve to middle. Lateral margins of mesepisterna with a fringe of setae covering mesepimera (Plate 63 figs 5-6). Mesepimera atrophied as cavity extending from mesocoxae to subhumeral angle, with a distinct fovea projecting into body cavity as an invagination from mesepimera (Werner, Chandler 1995) (Plate 63 figs 5-6). Basal transverse sulcus of pronotum continued laterally to foveae above procoxae. Notopleural sulcus well defined above coxae, extended or reduced posteriorly. Procoxal cavities open externally, closed internally. Mesocoxal cavities separated by mesosternum. Mesosternum narrowly meets metasternum medially.

First visible sternite (morphological sternite III) of abdomen (Plate 63 fig. 7) with narrow transverse cavities behind each metacoxa obscured by covering fringe of dense whitish setae (Plate 63 fig. 8). Phallobase and tegmen of male genitalia distinct. Tegmen simple to tripartite apically. Penis is shorter than combined length of phallobase and tegmen. Internal sac of male aedeagus may be provided with spines or not, primary gonopore located away from the apex of the sac and forms a large diverticulum in Nearctic and Neotropical species. In East Palaearctic, Afrotropical, Indo-Australian transition zone's and most Oriental species the primary gonopode of male genitalia is terminal on the internal sac. Anatomy of male genitalia almost unknown in Australian *Sapintus*, but species from New Zealand may have both spinose and spine-less internal sac (Werner, Chandler 1995). Male tergite IX with articulate lateroapical arms, T- or Y-shaped. Mesothorax with large mesothoracic glands present at least in some Nearctic, Afrotropical, Oriental & Papuan taxa.

Legs setose, claws simple. Males often with spinose pro- or mesotrochanters. Male tibiae (all of them) can possess recurved apical spines or median spines or denticles. Metatibiae can be modified in males – curved, flattened, spatulate, or covered with long setae. Claws long in all species from the Indo-Australian transition zone.

Sexual dimorphism may be well-defined or not. Protarsi can be slightly thickened in males rather than in females. Intermediate antennomeres of male with modifications in certain species. Trochanters and pro- or metatibiae may be derivative in males (modified: curved, spinose or denticulate). Extra exposed abdominal tergite (morphological tergite VIII) present in males; this tergite is broader than long. Male sternite VII often excavated or truncate apically (different than in females of same species). Male sternite VIII simple and retracted, sclerotized apically. Profemora can be more thickened in males rather than in females.

Preimaginal stage known for *Sapintus vexator* (Werner, 1965) (Kitayama 1982): Average body measurements 5 x 0.6 mm, antenna about 1/4 of head width. Epipharynx almost circular. Left mandible bisetose on dorsolateral margin, right mandible monosetose. Molar area angulated, not facing mola of opposite mandible. Hypopharynx with three rows of spines, two lateral and one posterior. Prothoracic legs with massive coxa, almost 2x longer than trochanter. Femur 2x longer than trochanter. Urogomphi without inner projections, not circular, meeting and finely notched at base, forming interrupted acute emargination. Urogomphi provided with a pair of fine lateral chalazae on inner margin.

Remarks on colouration patterns and possible mimicry among *Sapintus* from the Indo-Australian transition zone

Four main colour schemes can be recognized among Papuan and Pacific *Sapintus* (Table 1). The first group are uniformly dark coloured species - black or brown, sometimes with paler appendages. The second colour scheme comprises a contrasting bicoloured body with pale forebody and appendages and dark coloured elytra. The third colour scheme, the most common, consists of bi- or multicoloured species with a dark or pale forebody and distinct pale markings on generally dark elytra. These elytral markings vary in size, shape and quantity; usually there are two pale spots (yellow, orange or pale red) on each elytron. The fourth colour scheme may be just a branch of the third and is often hard to separate from it, and includes generally pale species with more or less distinct dark markings on the elytra. I was unable to assign *S. adonis* (Pic) and *S. plectilis* (Pic) to any colour scheme due to their specific colourations.

Table 1. Common colour schemes in Papuan and Pacific *Sapintus* and their representatives.

Colour scheme 1	**Colour scheme 2**	**Colour scheme 3**	**Colour scheme 4**
			
Sapintus albertisi (Pic), *S. alfurus* (Pic), *S. insularis* (Werner)	*Sapintus loriae* (Pic), *S. macrops* sp. nov., *S. semirugosus* (Pic)	*S. carolinensis* (Werner), *S. celeripes* sp. nov., *S. curvitibia* sp. nov., *S. densepunctatus* sp. nov., *S. dilensis* (Pic), *S. dyaulensis* nom. nov., *S. dybasi* (Werner), *S. geminus* sp. nov., *S. gemitus* sp. nov., *S. gracilicornis* (Pic), *S. horvathi* (Pic), *S. javanus* (Marseul), *S. madangensis* Uhmann, *S. malut* sp. nov., *S. oceanicus* (LaFerté-Sénectère), *S. papuus* (Pic), *S. semirugosus* (Pic), *S. sexualis* sp. nov., *S. vexator* (Werner)	*Sapintus airi* sp. nov., *S. hirtipennis* (Pic), *S. insulanus* (Pic), *S. malayensis* (Pic), *S. monstrosiantennatus* sp. nov., *S. quadrinotatus* (Pic)

It is clear that most *Sapintus* species in the study region are generally dark coloured with four more or less distinct elytral spots. Moreover, at least a third of Oriental *Sapintus* are coloured in that way (only a few Nearctic, Neotropical, Afrotropical or Australian *Sapintus* are similar; these species not listed here). Some remarkable Cleridae are coloured in a very similar way: species of *Anthicoclerus* Schenkling 1906 (distributed from Sri Lanka though mainland SE Asia to New Guinea) posses four large yellow spots on black elytra (Schenkling 1906; Mawdsley 1994). Similarly spotted colouration (dark elytra marked with 4 pale spots) is also not uncommon in Oriental and Papuan species of galerucine and alticine Chrysomelidae (L. Medvedev, personal communication). Among these leaf beetles, reverse cases are not rare, with black spotted generally pale elytra (L. Medvedev, personal communication). Also Coccinellidae species are often coloured in a similar way, but bear completely different – rounded and globose – body shape. I was unable to find any publications on general colour patterns on Coleoptera with hypothetical explanations for colour scheme. According to the theory of natural selection, body colouration will be related to or depends on the natural environment (adaptive background of colouration).

I hypothesize that the aforementioned similarities in colouration among different coleopteran taxa (and probably other insects) can be explained by mimicry. With some exceptions (see comments below), pale spotted *Sapintus*, *Anthicoclerus*, Galerucinae and Alticinae species are diurnal. *Sapintus dilensis* (Pic) was attracted to light in large numbers, but this fact is not controversial as this species is also collected during the daytime. Nocturnal and crepuscular *Sapintus* species may not be selected to evolve mimetic colouration, in contrast to diurnal species attacked by visually-oriented predators like insectivorous birds.

Mawdsley (1994) analysed mimic interactions in Cleridae and assumed for *Anthicoclerus* that 'although this name implies mimicry of Anthicidae (Coleoptera), it is probable that the two species in this genus and the anthicids for which this genus was named mimic Formicidae (Hymenoptera)'. I cannot reject or confirm this, but at least one well-known fact speaks against it. Many anthicidan taxa are considered to be canthariphilous (Young 1984) and bear a pair of specific mesothoracic glands. The role of these glands in the ecology of the Anthicidae was discussed previously (Hemp, Dettner 1997). Mesothoracic glands are only known be present in two beetle families - Anthicidae and Meloidae (Hemp, Dettner 1997). Mesothoracic glands of the Anthicidae contain iridoid components and glands are present in both sexes (Hemp, Dettner 1997). According to the studies carried by Hemp & Dettner (1997), secretions of the glands cause topical irritancy on potential predators, such as *Lasius* and *Myrmica* ants: 'ants ..., topically treated with freshly dissected ... mesothoracic glands [of the Anthicidae], showed similar reactions as described for iridomyrmecin as a topically acting insecticide ... All specimens made intensive cleaning movements ... the ants were completely disorientated, turning in circles. The legs also seemed to be paralysed. After 30-60 minutes, the ants returned to normal behaviour'. Iridoid components of mesothoracic glands, as also with cantharidin itself, are also poisonous to vertebrates, causing severe chemical burns (in cases of topical contact) or strong poisoning (when swallowed).

Young (1984) and Hemp (1994) listed several species of *Sapintus* as canthariphilous insects, three of them occur in the study region (*S. javanus* (Pic), *S. malayensis* (Pic), *S. plectilis* (Pic)). The first two are questionable (consider comments under 'ecology & biology' of each species). This information confirms *Sapintus* spp. as a potentially harmful group of insects.

In my opinion, all the taxa of Anthicidae (*Sapintus*), Cleridae (*Anthicoclerus*) and Chrysomelidae (Alticinae & Galerucinae) discussed above are possible part of a Batesian mimicry complex (when a group of harmless species [Cleridae, Chrysomelidae] share the same basic colour pattern and body form of toxic or harmful species [*Sapintus* spp.]). The possible role of Coccinellidae in aforementioned mimicry complex cannot be properly evaluated. This only can be proved by further investigations.

The main question remaining unanswered is why there are so many similarly coloured pale-spotted species among Oriental & Papuan *Sapintus*. My second hypothesis is that these species are members of a Müllerian mimicry complex (when a group of toxic or harmful species share the same basic colour pattern and body form). In this case all these species belong to the same taxonomical group.

Diversity and distribution of *Sapintus*

Distribution: Worldwide except Antarctic, absent at high latitudes. *Sapintus* are most diverse in tropical and subtropical regions of Asia (including both mainland and insular systems) and Central

Africa. Several species like *S. oceanicus* (LaFerté-Sénectère, 1849) are distributed over huge areas and recorded from several biogeographical regions (numerous Pacific islands, coastal areas of Asian and Australian mainland, various Indian islands, eastern coast of Africa, Madagascar). On the other hand, other species may have limited or very limited distribution areas, like endemics of Pacific islands New Caledonia - *S. austrocaledonicus* (Montrousier, in Perroud et Montrousier, 1865), Ryukyu Islands - *S. hamai* (Nomura, 1964), or Samoa - *S. samoanus* (Pic, 1908). Subgenus *Barbigerosapintus* Telnov, 1998 seems a group of 10 or over Oriental species limited to Asian mainland northwards to southern slopes of Himalayas, Sri Lanka and reaching the Philippines on insular systems isolated from Sunda shelf.

Biogeographical regions: Palaearctic, Afrotropical, Oriental, Nearctic, Neotropical, Australian. This group demonstrates signs of Gondwanan origin (Bonadona 1958).

Diversity, recent species and lower rank taxa: Nearctic and Neotropical faunal composition is better known, as these been two revisions by Werner (1962, 1983). Nearctic fauna consist of 14 species partly shared with Neotropical fauna (species reaching Central America or Caribbean Islands in their distribution). Neotropical fauna as far as known is richer and consists of 19 species plus 7 shared with Nearctic fauna. Palaearctic fauna consists of 19 species mostly distributed along southern and eastern limits of this choron; additional 13 species are shared with the Oriental region and one (*S. oceanicus*) – with both Oriental and Australian regions. Oriental fauna counting no less than 40 species plus same 13 shared with the Palaearctic fauna. Afrotropical region is as far as known the richest on *Sapintus* with over 58 species recorded from here. Notably, 99% of sub-Saharan African *Sapintus* are endemic to this choron and only single species is shared with the Oriental and Australian regions. Australian fauna is poorly studied but no less than 20 species occur here. The Indo-Australian transition zone's fauna of *Sapintus* according to this study contains 31 species.

Diversity, fossil species: No fossil records hitherto known for *Sapintus*.

Ecology and biology of *Sapintus*

No special attention was paid by previous authors to ecological preferences and the biology of *Sapintus*. Fragmentary data from literature supplemented with the author's personal observations are summarized below.

Three main ecological groups could be defined within *Sapintus* on the basis of geographical distribution of species. The main part of Nearctic species considered silvicol and are associated with mesophytic forested areas. Inhabitants of open habitats of South Palaearctic, South Nearctic, East and South Afrotropical and Australian (Queensland species excepted) faunas are deserticol, as these connected with arid to semi-arid regions. Silvicol species of tropical, subtropical and temperate rainforests of East Nearctic, Neotropical, East Palaearctic, Central Afrotropical, Oriental and North-East Australian faunas is the most diverse ecological group. On Sulawesi, several specimens were obtained from flood debris along forest streams (possible riparian species).

Many ecological niches recorded as inhabited by *Sapintus*. Adults of most Nearctic and some East Palaearctic species are reported to be associated with riparian habitats (Chandler 2002; Werner, Chandler 1995; Telnov, unpublished data) and considered riparian. Similar niche preferences demonstrate few Nearctic (Werner 1962) as well some Afrotropical species found in sand dunes. *S. bagiuniensis* Ronchetti, Colombini, Chelazzi, 1986 from coastal sandy dunes of Somalia coast considered psammophyl and riparian (Ronchetti, Colombini, Chelazzi 1986), *S. brincki* Bonadona, 1986 reported from sandy shores of Sri Lanka (Bonadona 1986). Silvicol species are reported from wet leaf litter (epigeic species) (Werner, Chandler 1995), as also from tree leafs and branches of lower (understorey) and canopy layer (Telnov, unpublished data). These silvicol species are known to have been mostly taken or beaten from vegetation (Werner 1962, 1983), under tree bark (Werner 1962), in moss 'roots' or under fallen wood (Werner 1962).

Sapintus are reported from various plants - grass level, bush or high trees. Werner and Chandler (1995) mentioned that monocots were being visited by various Nearctic, Neotropical and New Zealand species of *Sapintus*. Werner (1962) reported *Sapintus* associated with *Typha* spp., found beetles between dry leaves at the bases of plants and on stem. *Sapintus pellucidipes* (Broun, 1880) confirmed for both New Zealand autochthonous and imported monocots (*Carex* spp., *Freycinetia baueriana* (A. Cunningham), *Gahnia lacera* A.Richard, *G. setifolia* Hook, *Uncinia* spp., *Cortaderia jubata* (Lemoine) Stapf) (Kuschel 1990). This species found on bushes and in bush canopy. Nearctic species also recorded from *Medicago sativa* (Linnaeus) and on cotton buds (Werner 1983). Argentinean *Sapintus decerptus* (Pic, 1904) was collected from blossoms of *Aeschynomene montevidensis* Vogel, *Cynara cardunculus* (Linnaeus), and *Eryngium eburneum* Decne (Werner 1983). At least one species – *Sapintus monstrosiantennatus* sp. nov. (see description of this species below) - recorded from cocoa tree (*Theobroma cacao* Linnaeus). Males of widespread Pacific-Papuan-Oriental *S. vexator* (Werner, 1965) collected from *Portulaca lutea* Soland. ex G.Forst. (Werner 1965).

Interesting seems a report on adults and larvae of Neotropical *Sapintus similis* Werner, 1983 obtained from the egg sac of *Tetragnatha* sp. spider (Werner 1983).

Various species of *Sapintus* have different preferences of sunlight and are diurnal, nocturnal or crepuscular. For example, specimens of *Sapintus malut* sp. nov. were beaten in large numbers from secondary roadside vegetation in Central Halmahera during the hot midday, on the open sun (Telnov, unpublished data). Somalia's *S. bagiuniensis* reported be active at dawn during the dry season (Ronchetti, Colombini, Chelazzi 1986). Many species recorded were attracted to light (Werner 1983; Telnov, unpublished data; Weigel, personal communication). Among species of Indo-Australian transition zone, at least *S. dilensis, S. gracilicornis* and *S. vexator* were attracted to white (Telnov, unpublished data), UV (Werner 1983), or mercury vapour light (Bonadona 1981; Telnov, unpublished data).

As already stated above, several if not all Nearctic, Afrotropical, Oriental and Papuan *Sapintus* are canthariphilous.

Nomenclatural changes

For Anthicinae it was a typical case by earlier authors to place most of their new species to *Anthicus* sensu lato. Many Anthicinae species originaly described 50-100 years ago and their descriptions are insufficient. Consequently, almost each taxonomical review results in several nomenclatural changes.

Thirteen new combinations made here are based on morphological and anatomical characters of the genus *Sapintus* presented in studied specimens (these characters are discussed above in 'Morphology and anatomy of *Sapintus*'). All new combinations based on study of type specimens.

Sapintus (s. str.) *adonis* (Pic, 1900) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *alfurus* (Pic, 1900) **comb. nov.** (from *Anthicus* Paykull)

Sapintus anguliceps (LaFerté-Sénectère, 1849) **comb. nov.** (from *Cyclodinus* Mulsant et Rey)

Sapintus (s. str.) *bizonellus* (Marseul, 1882a) **comb. nov.** (from *Anthicus* Paykull) (see also Telnov 2006a)

Sapintus (s. str.) *bryanti* (Pic, 1911) **comb. nov.** (from *Anthicus* Paykull) (see also Telnov 2007a)

Sapintus (s. str.) *dybasi* (Werner, 1965) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *hirtipennis* (Pic, 1900) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *insulanus* (Pic, 1900) **comb. nov.** (described as *Anthicus* Paykull, Uhmann (1990: 142) moved this species to *Hirticomus* Pic (now *Hirticollis* Marseul). This species was subsequently cited as *Hirticomus* by Uhmann (2000))

Sapintus (s. str.) *insularis* (Werner, 1965) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *latioricollis* (Pic, 1929) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *loriae* (Pic, 1900) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *quadrinotatus* (Pic, 1900) **comb. nov.** (from *Anthicus* Paykull)

Sapintus (s. str.) *semirugosus* (Pic, 1902) **comb. nov.** (from *Anthicus* Paykull)

Sapintus subopaciceps (Pic, 1913) **stat. rev.** (from *Anthicus* Paykull)

Originally described as *Anthicus*, this species was first placed to *Sapintus* by Uhmann (1993: 401). Telnov (2007c: 32) studied the holotype and moved this species back to *Anthicus*. In fact, the holotype was an old specimen collected or stored under insufficient conditions and therefore lacking mesepisternal setae. After getting in to my hands a fresh specimen from Indonesian Borneo it was re-confirmed, this species have *Sapintus*-typical setose mesepisterna. Consequently, I am restoring this species in *Sapintus*, as it was proposed by Uhmann (1993).

The following new synonymy was confirmed:

Sapintus anguliceps (LaFerté-Sénectère, 1849a)
= *Sapintus apicatus* (Fairmaire, 1896) **syn. nov.**
= *Sapintus apicatus birmanicus* (Pic, 1907) **syn. nov.** (see also Chandler, Nardi, Telnov 2004)

Sapintus dilensis (Pic, 1900)
= *Sapintus relatus* Bonadona, 1981 **syn. nov.**

Sapintus flavonotatus (Pic, 1908)
= *Sapintus barbei* Bonadona, 1978 **syn. nov.**
Remark: I am not familiar with the taxon described as *Sapintus barbei ceylonicus* Bonadona, 1986. This taxon to be remained as subspecies of *S. flavonotatus* until type material will be located and studied.
= *Anthicus meritorius* Pic, 1914 **syn. nov.**

Sapintus gracilicornis (Pic, 1895)
= *Anthicus gracilicornis* v. *semiobliteratus* Pic, 1900 **syn. nov.**
= *Anthicus neoguineensis* Pic, 1900 **syn. nov.**
= *Sapintus repentinus* Bonadona, 1981 **syn. nov.**

Sapintus insularis (Werner, 1965)
= *Sapintus placitus* Bonadona, 1981 **syn. nov.**

Sapintus javanus (Marseul, 1882a)
= *Sapintus sodalis* (Pic, 1895) **syn. nov.**

Sapintus oceanicus (LaFerté-Sénectère, 1849a)
= *Anthicus oceanicus* var. *Françoisi* Pic, 1902 **syn. nov.**

Sapintus rarus (King, 1869)
= *Sapintus deitzi* Werner, Chandler, 1995 **syn. nov.**

King (1869: 22) described *Anthicus rarus* from Australia. MacLeay (1872: 307) added a new variation, *A. rarus* var. *propinquus*. This taxon was synonymised with nominative form by Lea (1895: 621). Uhmann (1995a: 525) proposed a new combination for *A. rarus* to *Sapintus* where it remained until now. Later, Uhmann (2007: 51) mentioned *Anthicus propinquus* MacLeay as a good species of *Anthicus* and separately from *Sapintus rarus* (King). Bonadona (1981: 195) described *Sapintus propinquus* from Bismarck Archipelago which have been consequently cited by Telnov (1999: 78). Thereafter, van Hille (1988: 324) described *Anthicus (Aulacoderus) propinquus* (now *Aulacoderus*) from South Africa. Last taxon has never been cited since the original description. I propose the following new names for the following aforementioned taxa:

Sapintus dyaulensis **nom. nov.**, new name for *Sapintus propinquus* Bonadona, 1981

Aulacoderus nigroelytratus **nom. nov.**, new name for *Anthicus (Aulacoderus) propinquus* van Hille, 1988 [I am not familiar with current status of this species].

Species groups

At least six species groups can be treated among the *Sapintus* inhabiting the study region and adjacent territories. These groups are informal and are based on morphological similarities rather than on phylogenetic relationships.

Sapintus celeripes group

Species with pale markings in form of spots or transverse bands on generally dark elytra. Pronotum distinctly narrowed postmedium laterally. Forebody very densely punctured, intervening spaces smaller than punctures and whole dorsal surface of forebody looks opaque (certain specimens of *S. celeripes* sp. nov. are sparse punctured on head with intervening spaces generally broader than punctures). Male or female metatibiae modified - widened or slightly curved.

The following species are herewith arranged to this group: *S. celeripes* sp. nov., *S. malut* sp. nov., *S. sexualis* sp. nov. (all from Papuan region).

Sapintus gracilicornis group

Generally large species (*S. carolinensis* is the smallest within the group) with long and slender antennae and four pale spots on generally dark elytra (anterior pair or spots may be more or less reduced in certain specimens). Dorsal surface coarse and dense punctured, but generally smooth between punctures. Elytral pubescence often very long, erect to suberect. Male aedeagus long and slender, pubescent or not pubescent laterally, slightly prolongate apically.

The following species are herewith placed in this group: *S. andreaskopetzi* sp. nov. (Nepal), *S. binhensis* (Pic, 1922) (Vietnam), *S. carolinensis* (Werner, 1965) (Micronesia), *S. cochaeres* (Lewis, 1895) (Japan, Far East of Russia), *S. cruciellus* (Marseul, 1882a) (Indonesia: Java), *S. dyaulensis* Telnov (consider name change above) (Bismarck Archipelago & New Guinea), *S. gracilicornis* (Pic, 1895) (Oriental & Papuan region), *S. hirtisetosus* (Marseul, 1884) (Indonesia: Sumatra, The Philippines: Luzon, Palawan), *S. inspoliatus* Bonadona, 1981 (The Philippines: Tawi-Tawi), *S. litorosus* (Lewis, 1895) (Japan), *S. longehirsutus* (Pic, 1922) (Vietnam), *S. longepilosus* (Pic, 1942) (China, without precise location), *S. marseuli* (Pic, 1892) (Japan, S & E China, Nepal, Taiwan, Thailand, Vietnam), *S. nomurai* Nardi, 2004 (Japan: Ryukyu Islands), *S. subrubrocinctus* (Marseul, 1882a) (Indonesia: Sumatra), *S. triparticornis* (Pic, 1926) (Vietnam).

***Sapintus horvathi* group**

Species with pale markings in form of spots or transverse bands on generally dark elytra (*S. hirtipennis* is generally paler than other members of the group). Pronotum distinctly narrowed postmedium laterally. Head and anterior portion of pronotum (at least) smooth and shiny, sparsely punctured. Elytra with feeble but visible postbasal transverse impression. Tegmen of male aedeagus broad, setose on lateral margins, broadly rounded or obtuse angulate apically.

The following species are herewith placed in this group: *S. geminus* sp. nov., *S. hirtipennis* (Pic, 1900), *S. horvathi* (Pic, 1902) (all from Papuan region).

***Sapintus javanus* group**

Small, very coarse punctured species with two pairs of pale spots on generally black elytra (first pair distinctly larger). Eyes small, tempora almost straight, head base very broadly rounded. Antennae bicolourate (pale at base). Male aedeagus elongate and slender, pointed apically, with or without little preapical lateral denticles.

This group contains *S. hartmanni* sp. nov. (Nepal), *S. javanus* (Marseul, 1882a) (Oriental & Papuan regions), *S. latioricollis* (Pic, 1929) (Vietnam, Thailand).

***Sapintus oceanicus* group**

Species with four pale spots on generally darker elytra. Forebody densely punctured, intervening spaces narrower than punctures (in certain specimens of *S. vexator* punctures may also me generally coarser and sparser). Male aedeagus quite simple with more or less strongly prolongate apex.

This group contains: *S. densepunctatus* sp. nov., *S. dilensis* (Pic, 1900) (both from Papuan region), *S. oceanicus* (LaFerté-Sénectère, 1849a), *S. vexator* (Werner, 1965) (both widely distributed in coastal areas of the Pacific and Indian oceans).

***Sapintus plectilis* group**

Generally pale species with or without dark markings on elytra. Male intermediary antennomeres modified in some species. Tegmen of male aedeagus (in species with males described) slightly spatulate-like widened preapically, with narrow and somewhat prolongate apex.

This group contains: *S. insulanus* (Pic, 1900) (Papuan region, possible Australia: Queensland), *S. insignatipennis* (Pic, 1943) (S India), *S. monstrosiantennatus* sp. nov. (Wallacea), *S. plectilis* (Pic, 1910) (Wallacea & Oriental region), *S. pollocki* Uhmann, 1999 (Australia: Queensland).

Diagnoses of *Sapintus* species from the Indo-Australian transition zone

Please refer to 'Material and methods' for additional information on the structure of the current chapter.

Sapintus (s. str.) ***adonis*** (Pic, 1900) (Plate 44 figs 1-2)

Holotype ♀ MSNG: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / Typus [printed, label red, black border] / Adonis Pic [handwritten, black border] / A. adonis Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Measurements, holotype ♀: Total body length 3.12 mm, maximum combined width immediately postmedium of elytra 0.90 mm. Head 0.62 mm long, across the eyes 0.60 mm broad, pronotum 0.60 mm long, maximum width 0.50 mm, elytra 1.90 mm long, 0.90 mm postmedium broad.

Description: Head, pronotum and scutellum orange-red. Elytra black with apical third orange (paler than forebody). Three basal antennomeres are pale, remaining antennomeres are black-brown. Palpi yellowish, partly darkened. Femora reddish to reddish brown, tibiae and tarsi blackish-brown. Underside uniformly black. Head dorsally and ventrally smooth and shiny. Eyes midsized, slightly protruding from outline of the head. Tempora about 1/4 shorter than the length of an eye, converging toward a very broadly rounded, subtruncate base. Punctures very fine and sparse, hardly visible. Intervening spaces much larger than punctures. Dorsum of head fine, whitish, very sparse but quite long pubescence. Antennae long and slender, reaching over elytral humeri in the female. Second antennomere shorter than the next one. Antennomeres 3-8 elongate, slightly thickened distally. Terminal antennomere asymmetric, blunt, 1/4 longer than the penultimate one. Terminal maxillary palpomere large and somewhat axeform. Pronotum smooth and shiny, somewhat globose dorsally, with feeble postmedian lateral transverse impression, narrower than the head. Anterior margin broadly rounded.

On sides and near base with numerous large pores, on disc very sparsely punctate. Intervening spaces ranging from larger than punctures (in basal part) to much larger than punctures (on disc). Pubescence extremely sparse, somewhat longer than on the head, with separate erect tactile setae on the sides and on the disc. Scutellum rounded apically, densely pubescent. Elytra elongate, smooth and shiny. Punctures very large (pore-like) in the basal half, getting smaller postmedium. In the basal half, intervening spaces range from as large as the punctures to twice as large as the punctures. Intervening spaces getting larger postmedium. A very long erect white tactile seta rises from each pore. Pubescence simple, with no undersetae present on the dorsum. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Female basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite and sternite VII not studied. Genital organs not studied.

Sexual dimorphism: Male is unknown.

Distribution: This species is only known by the holotype collected by L.M. D'Albertis on the River Fly in the southern lowlands of Papua New Guinea and without precise locality. D'Albertis reached up to 580 miles (~937 km) upriver during his expedition. Consequently, the locus typicus of this species is somewhere between the delta and 937 km of the River Fly course.

Remarks: A very atypical *Sapintus* with a smooth and very sparsely punctured forebody and lacking undersetae on the elytra. The holotype, however, has remnants of the fringe of the setae on the lateral margins of the mesepisterna, as in a typical *Sapintus*.

Sapintus (s. str.) ***airi* sp. nov.** (Figs 1-7, map 2, plate 44 figs 3-4)

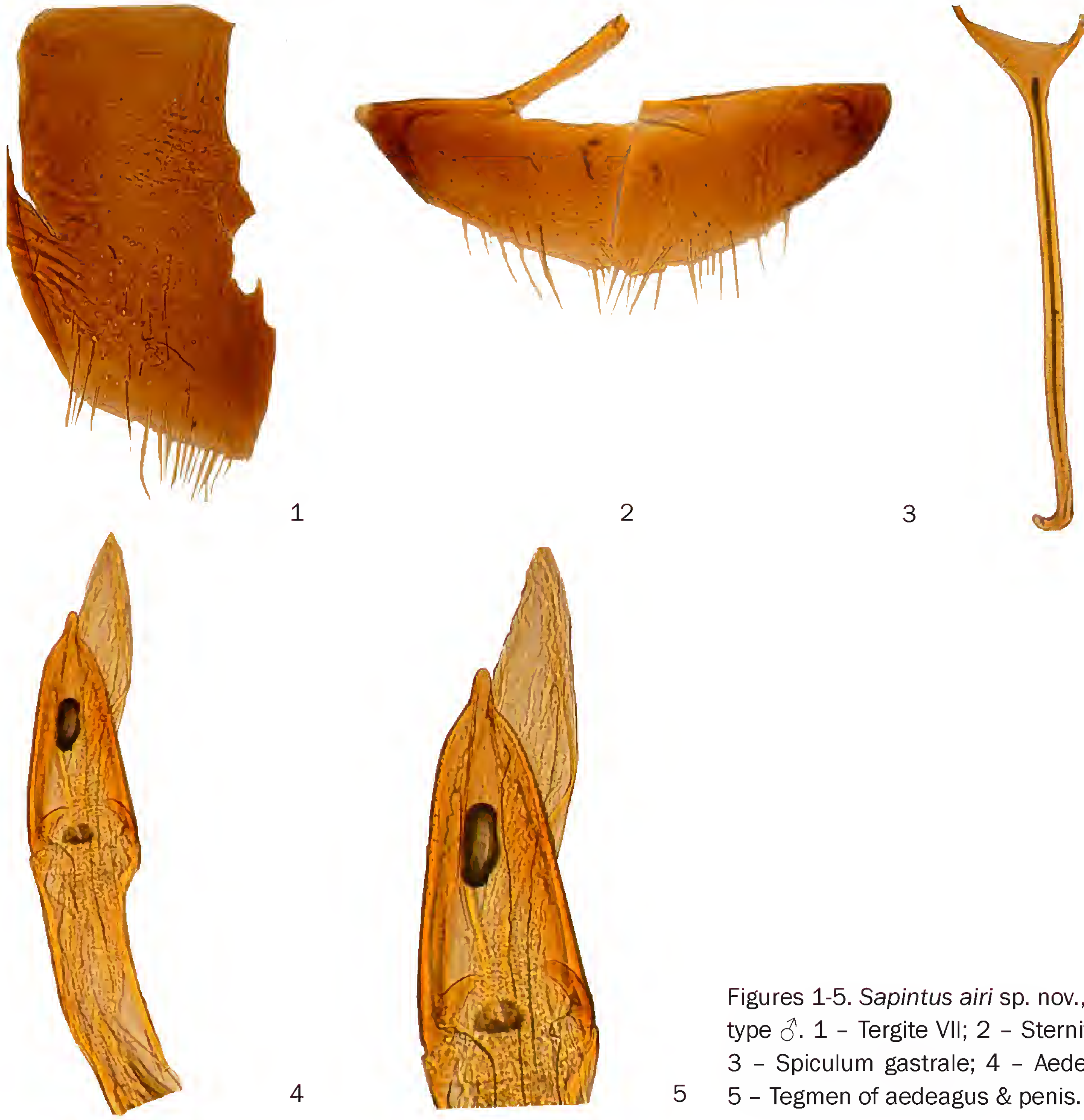
Holotype ♂ BMNH: at light [printed] / SOLOMON ISLANDS: San Cristoval, S. Wainoni. 25.vii.65 P.N. Lawrence. B.M.1966-1. [printed].

Paratypes 4 specimens. 1♂ BMNH: Guadalcanal [printed] 9th Dec [handwritten] 196 [printed] 5 [handwritten] / M. McQuillan [printed] 21 0 1 6 [handwritten] SOLOMON IS. [printed] / SOLOMON IS: Pres. P.J.M.Greenslade. B.M.1966-477. [printed]; 1♀ BMNH: at light [printed] / SOLOMON ISLANDS: Guadalcanal, nr. Honiara, Kukum. Vii-viii.65. P.N.Lawrence. [printed]; 1♂ BMNH: SOLOMON IS. Guadalcanal [printed] 4644. Conga 4/3. [handwritten] 196 [printed] 3. [handwritten] P.Greenslade [printed] / SOLOMON IS: Pres. P.J.M.Greenslade. B.M.1966-477. [printed].

Derivatio nominis: Named after 'airi', the mythical shark of Solomon Islands traditional mythology.

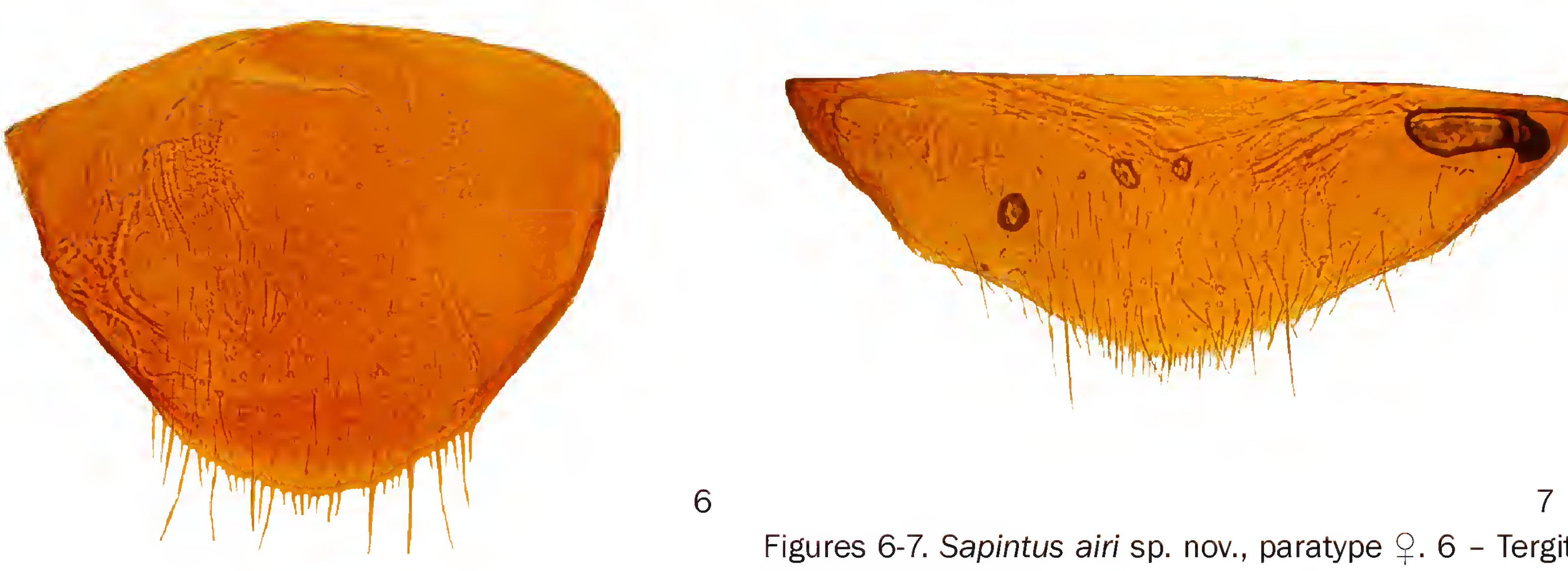
Measurements, holotype male: Total body length 2.51 mm, maximum combined width across the middle of elytra 0.77 mm. Head 0.56 mm long, across the eyes 0.51 mm broad, pronotum 0.45 mm long, maximum width 0.40 mm, elytra 1.50 mm long, 0.77 mm broad. Measurements, paratype female from Guadalcanal: Total body length 2.56 mm, maximum combined width across preapical third of elytra 0.84 mm. Head 0.56 mm long, across the eyes 0.52 mm broad, pronotum 0.54 mm long, maximum width 0.42 mm, elytra 1.46 mm long, 0.84 mm broad.

Description: Forebody orange, head is darker. Elytra yellow with black markings, consisting of a little humeral and a large semicircular median spot on each elytron, plus a large combined spot covering the apices. Antennae, with the exception of 2-3 terminal antennomeres, palpi and legs yellow. Protibiae (in one paratypic specimen also mesotibiae) darkened, brown. Underside reddish-brown to orange, pro- and mesocoxae yellow-coloured. Body colouration somewhat resembles the Palaearctic *Stricticollis peplifer* (Marseul, 1879) or the Papuan *Sapintus hirtipennis* (Pic, 1900). Head smooth dorsally, weakly shiny. Eyes midsized, weakly prominent, in the dorsal view slightly longer than the straight tempora. Temporal angles broadly rounded. Head base truncate or subtruncate. Punctures quite large but very flat and sparse, intervening spaces mostly larger than punctures. Large areas on frons and vertex are impunctured. Pubescence yellow, fine and long. Antennae slender, in both sexes reaching over elytral humeri. Second antennomere in male 1/4 shorter than next one. Antennomeres 3-8 elongate and slender. Antennomeres 9-10 slightly shortened and thickened. Terminal antennomere asymmetric, conical, pointed, 1/4 longer than penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum rounded anteriorly, narrower than head, strongly narrowed postmedium laterally toward base. Dorsally smooth, densely and confusedly punctured on disc (especially postmedium). Punctures of variable size, intervening spaces smaller than punctures. Antero-lateral margins smooth, almost impunctured. Pubescence yellow, fine, long and dense, appressed, with separate long erect tactile setae on the sides and on the disc. Scutellum narrowly triangular, pointed apically. Elytra elongate and slightly widened across middle or postmedium, smooth dorsally. Humeri rounded. Punctures large and dense, getting more flat in apical third. Intervening spaces ranging from smaller than punctures to as large as punctures. Pubescence yellowish, long and dense, suberect, with several very long erect to suberect tactile setae present on the disc. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward postbasal



1 2 3 4 5

Figures 1-5. *Sapintus airi* sp. nov., holotype ♂. 1 – Tergite VII; 2 – Sternite VII; 3 – Spiculum gastrale; 4 – Aedeagus; 5 – Tegmen of aedeagus & penis.



6 7

Figures 6-7. *Sapintus airi* sp. nov., paratype ♀. 6 – Tergite VII; 7 – Sternite VII.

transverse impression of elytra. Hind wings fully developed. Legs long and slender. Protibiae slightly thickened in both sexes, but in the male with very feeble excavation on inner distal part. Female metatibiae thickened compared to slender male tibiae. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male trapezoid, truncate on apical margin (Fig. 1). Morphological sternite VII in male short, very broadly rounded on apical margin (Fig. 2). Male aedeagus with apically narrowly prolongated tegmen (Figs 4-5). Tegmen with strong basal hook on each side. Morphological tergite VII in female broadly rounded and with long setation on apical margin (Fig. 6). Morphological sternite VII in female broadly rounded on apical margin (Fig. 7).

Sexual dimorphism: Almost not indicated. Intermediary antennomeres (3-7) comparatively slightly shorter in female than in male. Female metatibiae thickened compared to slender metatibiae of male.

Ecology & biology: Two of the type specimens were collected at light.

Differential diagnosis: Among all *Sapintus* species from the Indo-Australian transition zone, *Sapintus airi* is conspicuous due to its generally pale dorsal body colouration. *S. hirtipennis* (Pic, 1900) (Papuan Peninsula of New Guinea) is very similarly coloured, but is different, primarily due to its rounded head base (truncate / subtruncate in *S. airi*), short tempora (in dorsal view almost as long as the eye in *S. airi*), punctures being coarse and partly rugulose on the pronotal disc (dense but not rugulose in *S. airi*), elytral punctures being smaller and sparser (large and dense in *S. airii*). The male genital organs were not studied in *S. hirtipennis* (the male is unknown).

Distribution: This species is known from the eastern part of the Solomon Islands, particularly from San Cristobal (= San Cristoval) and Guadalcanal islands (map 2).

Sapintus (s. str.) ***albertisi*** (Pic, 1900) (Figs 8-9, plate 44 figs 5-7)

Lectotype ♀ MSNG [herewith designated]: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / Typus [printed, label red, black border] / Albertisii [sic!] Pic [handwritten, black border] / A. Albertisi Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Paralectotypes 18 specimens [herewith designated]: 12 MSNG: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten] / TYPE [printed, label red, black border] / albertisii [sic!] Pic [handwritten]; 5 MNHN, 1 DTC: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten] / TYPE [printed, label red] / A Albertisi Pic [printed, black border].

Measurements, lectotype ♀: Total body length 3.15 mm, maximum combined width across the middle of elytra 1.05 mm. Head 0.60 mm long, across the eyes 0.69 mm broad, pronotum 0.58 mm long, maximum width 0.50 mm, elytra 1.97 mm long, 1.05 mm broad.

Description: Forebody black, elytra dark brown to black. Antennae black-brown with three basal antennomeres paler. Maxillary palpi brown. Femora brown, tibiae and tarsi black to dark brown. Underside uniformly black to dark brown. Head with large prominent eyes, very densely punctate. Tempora about 1/3 of the length of an eye. Head base almost truncate, very broadly rounded. Punctures of two sizes: basic punctures very small and dense, covering the whole dorsum of the head and with intervening spaces being smaller than these punctures. Additional larger - but flat and much sparser - punctures scattered over the frons and the vertex. Pubescence fine, whitish, quite long and dense. Antennae long and slender, reaching over elytral humeri in the female. Second antennomere shorter than the next one. Antennomeres 3-8 elongate, slightly thickened distally, 9-10 stronger, widened distally. Terminal antennomere asymmetric, pointed, slightly longer than the penultimate one. Terminal maxillary palpomere large and somewhat axeform. Pronotum very densely punctate dorsally, with weak postmedian lateral transverse impression, significantly narrower than the head. Anterior margin broadly rounded. Punctures double, similar to the ones on the head, but both groups of punctures are generally larger. Pubescence like on the head but generally longer and with separate erect tactile setae on the sides and on the disc. Scutellum truncate apically. Elytra elongate, smooth and shiny. Punctures very large and dense but getting somewhat smaller in apical third. Intervening spaces smaller or equal to punctures. Main pubescence pale brown, long and dense, suberect. Undersetae dense, directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Female basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in female broadly rounded on apical margin (Fig. 8). Morphological sternite VII in female short and broad, broadly rounded on apical margin (Fig. 9).

Sexual dimorphism: The antennae are compar-

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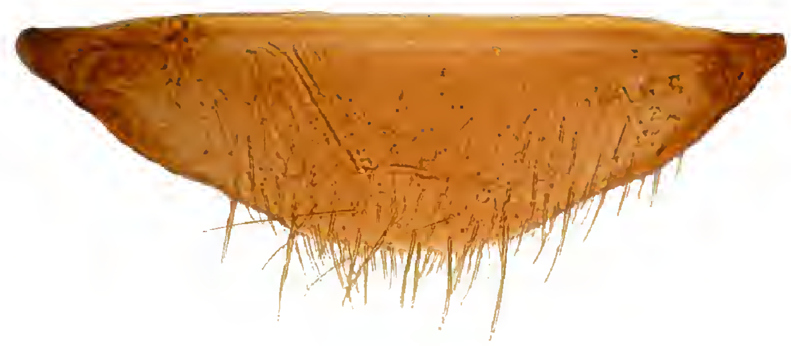

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Figures 8-9. *Sapintus albertisi* (Pic, 1900), paralectotype ♀. 8 – Tergite VII; 9 – Sternite VII.

atively shorter in the female than in the male.
Distribution: This species is only known by the holotype collected by L.M. D'Albertis on the River Fly in the southern lowlands of Papua New Guinea and without precise locality. D'Albertis reached up to 580 miles (~937 km) upriver during his expedition. Consequently, the locus typicus of this species is somewhere between the delta and 937 km of the River Fly course.

Sapintus (s. str.) ***alfurus*** (Pic, 1900) (Map 3, plate 45 figs 1-2)

Holotype ♂ MSNG: N.GUINEA MER. KAPAKAPA *Mag. Giugno.1891* L.Loria [printed, text partly italic, black border] / Typus [printed, text red, red border] / alfurus Pic [handwritten, black border] / Anthicus alfurus Pic typus ! [handwritten] / Mus. Civ. Genova [printed, label pale].

Measurements, holotype ♂: Total body length 2.46 mm, maximum combined width immediately behind the middle of elytra 0.84 mm. Head 0.55 mm long, across the eyes 0.53 mm broad, pronotum 0.47 mm long, maximum width 0.51 mm, elytra 1.44 mm long, 0.84 mm postmedium broad.
Description: Forebody black, elytra black-brown. Antennae pale brown with three black-brown terminal antennomeres. Palpi brown to yellowish brown. Legs brown to black. Underside uniformly black-brown. Head smooth and somewhat shiny, with large prominent eyes. Tempora about a half of an eye's length, slightly converging toward a subtruncate head base. Punctures of variable size – smaller and large, with smooth intervening spaces that also vary widely in size. Frons with distinct broad impunctured median line. Vertex feebly impressed medially. Pubescence greyish, long and quite dense. Antennae short, hardly reaching elytral humeri in the male. Second antennomere more or less as long as the next one. Antennomeres 8-10 shortened and distinctly thickened distally. Terminal antennomere asymmetric, bluntly conical, 1/4 longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum dorsally very densely punctate, flattened, broadly rounded anteriorly and the lateral margins distinctly constricted posterior to the pronotal midpoint, just slightly narrower than the head. Punctures very dense and coarse, intervening spaces much smaller than the punctures. Pubescence greyish, fine, long and dense, suberect, with several erect tactile setae on the sides and on the disc. Scutellum small, triangular. Elytra elongate, smooth and shiny. Punctures very large and dense in the basal half, getting much smaller and sparser postmedially. Intervening spaces irregular, in the basal half mostly smaller, in the postmedian half ranging from as large to 3 times larger than punctures. Pubescence yellowish, fine, long and dense, directed obliquely laterally. Undersetae directed obliquely laterally. Sutural striae broad, developed from the middle toward the apices. Hind wings fully developed. Legs long and slender, especially femora. Morphological tergite VII and sternite VII not studied. Male aedeagus with prolongate and pointed apex.
Sexual dimorphism: Female is unknown.
Distribution: This species is only known by the holotype collected at Kapa Kapa (= Gabagaba) village in Central Province, Papua New Guinea.

Sapintus (s. str.) ***celeripes* sp. nov.** (Figs 10-15, map 3, plate 46 figs 1-4)

Holotype ♂ NME: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50-130 m, 10.IX.2010, secondary rainforest on limestone & clearings, leg. D.Telnov.

Paratypes 4 specimens. 1♀ DTC: same labels as in holotype; 1♂ NME: W-PAPUA Raja Ampat Prov. Salawati Isl. or., Kalobo 01°03'15"S, 131°04'32"E 24.-28.I.2004 leg. A.Skale; 1♀ DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Lobo vill. env., 3°44'55"S, 134°06'42"E, 0-50 m, 15.IX.2010, sago swamp, leg. D.Telnov; 1♀ DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 2-4 km NE, 3°39'26"S, 133°46'21"E, 150-200 m, 19-20.IX.2010, primeval lowland rainforest & clearing, limestone, leg. D.Telnov.

Derivatio nominis: Named from the Latin 'celeripes' [outrunner], because of the adults being very agile and quick moving.

Measurements, holotype ♂: Total body length 2.50 mm, maximum combined width across the middle of elytra 0.75 mm. Head 0.56 mm long, across the eyes 0.52 mm broad, pronotum 0.52 mm long, maximum width 0.45 mm, elytra 1.40 mm long, 0.75 mm broad. Measurements, paratype ♀ from vicinity of Kaimana: Total body length 2.95 mm, maximum combined width across the middle of elytra 0.90 mm. Head 0.70 mm long, across the eyes 0.66 mm broad, pronotum 0.55 mm long, maximum width 0.58 mm, elytra 1.70 mm long, 0.90 mm broad.

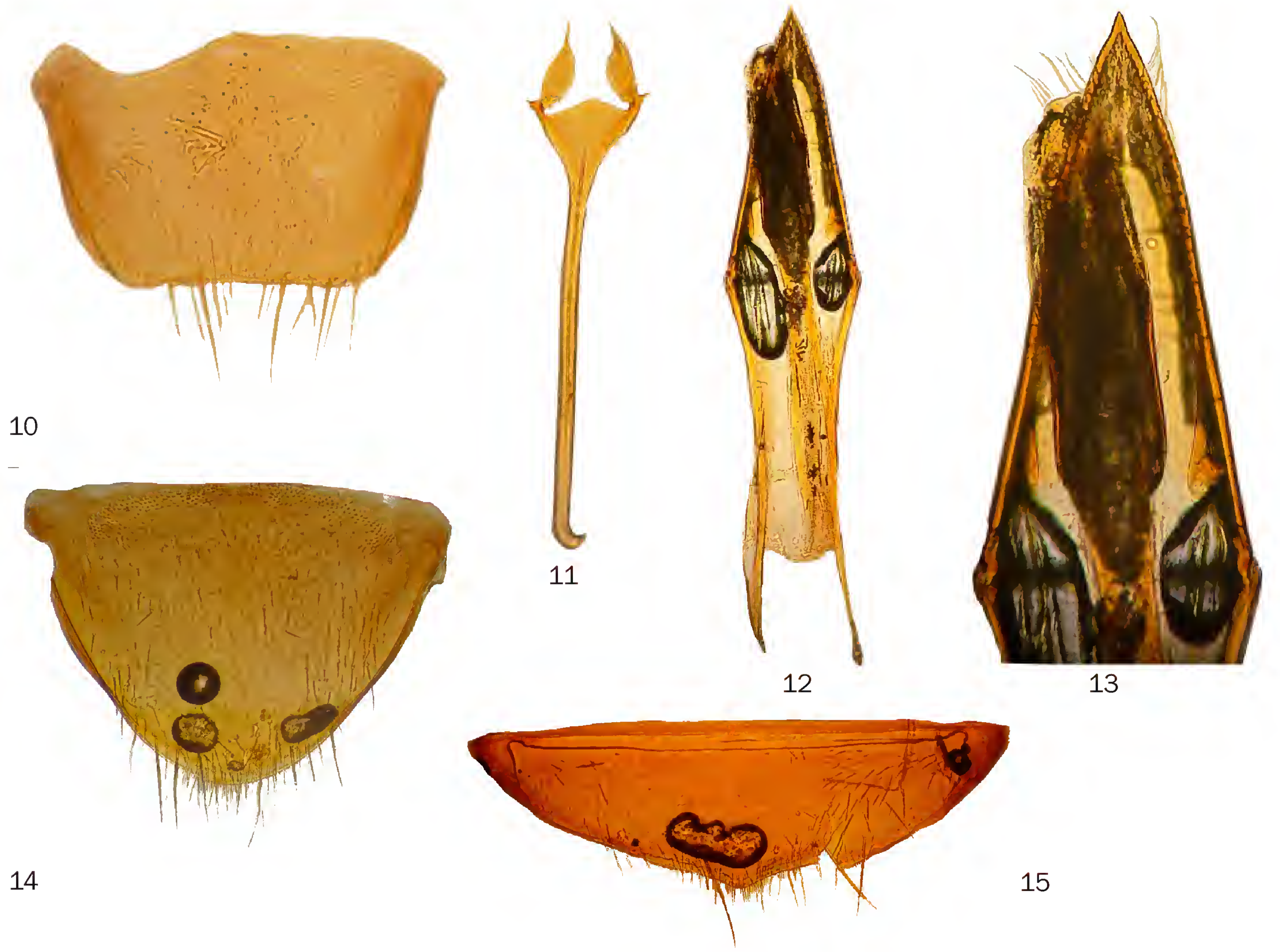
Description: Forebody orange, head darker in some paratypic specimens. Elytra black with pale markings, consisting of a yellow-to-orange broad postbasal transverse band and broad circular or transverse spot in the apical third of each elytron. Anterior band is not bearing lateral margins of elytra, can be narrowly interrupted by darker colouration of suture. Posterior spot or band not bearing lateral margin and is narrowly interrupted on suture, its anterior margin not straight but with pointed projection of black colouration in the middle. Antennae, palpi and legs yellow-to-orange. Underside reddish-brown to orange, coxae paler coloured. Head smooth, with large prominent eyes. Tempora broadly rounded together with base. Punctures flat, very dense around the eyes and on the frons, intervening spaces smaller than punctures. Vertex is much more sparsely and finely punctured, smooth and shiny. Pubescence yellowish, fine and long, sparse. Antennae slender, in both sexes reaching the postbasal transverse impression of the elytra. Second antennomere in male 1/5 shorter than the next one. Antennomeres 3-7 elongate and slender. Antennomeres 8-10 slightly shortened, of which 9-10 are thickened distally. Terminal antennomere asymmetric, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum broadly rounded anteriorly, significantly narrower than the head, strongly narrowed postmedium laterally toward narrow base. Very densely and confusedly punctured on disc, intervening spaces much smaller than punctures. Antero-lateral margins smooth, covered with numerous but much finer punctures. Pubescence yellowish, fine, long and dense, appressed, with separate long erect tactile setae on the sides and on the disc. Scutellum narrowly triangular, pointed apically. Elytra elongate and slightly widened across middle, smooth dorsally. Humeri rounded. Postbasal transverse impression feeble but visible. Punctures large, getting smaller in apical third. Intervening spaces ranging from smaller than the punctures to slightly larger than the punctures. Pubescence yellowish, long and dense, suberect, with numerous very long erect to suberect tactile setae present on the disc. Undersetae directed obliquely laterally. Sutural striae broad, completely developed. Hind wings fully developed. Legs long and slender. Protibiae slightly thickened in both sexes, with very feeble excavation on inner distal part in the male. Female metatibiae thickened compared to slender male tibiae. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Male basal tarsomere of metathoracic legs distinctly thickened. Morphological tergite VII in male is short, trapezoid, truncate on apical margin (Fig. 10). Morphological sternite VII in male is short, very broadly rounded on apical margin. Male aedeagus has a pointed tegmen, which is setose preapically (Figs 12-13). Morphological tergite VII in female is narrowly rounded and with long setation on apical margin (Fig. 14). Morphological sternite VII in female is broadly rounded with very short median projection (Fig. 15).

Sexual dimorphism: Metatibiae thickened in female. Protibiae in male with feeble excavation on inner distal margin.

Variability: The size and shape of the pale elytral markings vary. The specimens vary in body length from 2.50 to 2.95 mm.

Ecology & biology: The specimens were collected in both primary and disturbed lowland rainforest, and in sago swamps, from green leaves and dead thin branches.

Differential diagnosis: *Sapintus celeripes* is close to *S. geminus* sp. nov. (described below; Papua New Guinea: Madang Province) and *S. horvathi* (Pic, 1902) (New Guinea & Central Moluccas). The tegmen of the aedeagus is narrowly pointed in new species and not spatulate like in *S. geminus*,



Figures 10-15. *Sapintus celeripes* sp. nov. 10-13: Holotype ♂, 10 – Tergite VII; 11 – Spiculum gastrale; 12 – Aedeagus; 13 – Tegmen of aedeagus. 14-15: Paratype ♀. 14 – Tergite VII; 15 – Sternite VII.

or broadly and shortly pointed like in *S. horvathi*. It is especially close to *S. malut* sp. nov. (described below; North Moluccas), but differing in the tegmen of the aedeagus, setose preapically (without pubescence in *S. malut*).

Distribution: This species is known from the southern part of Bird's Neck isthmus and the eastern (lowland) part of Salawati Island (Raja Ampat Islands).

Sapintus (s. str.) ***curvitibia* sp. nov.** (Figs 16-22, map 6, plate 45 figs 5-6)

Holotype ♂ BMNH: at light [printed] / SOLOMON ISLANDS: San Cristoval, S. Wainoni. 25.vii.65 P.N.Lawrence. B.M.1966-1. [printed].

Paratypes 4 specimens. 1♂ & 2♀ BMNH: same labels as in holotype; 1♂ BMNH: Black light [printed] / SOLOMON ISLANDS San Cristoval, camp 2,150'. 28.vii.65. Ros. Soc. Exped. B.M.1966-1. [printed].

Derivatio nominis: Named from the Latin 'curvus' [curved, bent] + 'tibia' [tibia], because of the modified male metatibiae.

Measurements, holotype ♂: Total body length 3.30 mm, maximum combined width immediately postmedium of elytra 1.08 mm. Head 0.60 mm long, across the eyes 0.67 mm broad, pronotum 0.60 mm long, maximum width 0.52 mm, elytra 2.10 mm long, 1.08 mm broad. Measurements, paratype ♀: Total body length 3.57 mm, maximum combined width immediately postmedium of elytra 1.05 mm. Head 0.66 mm long, across the eyes 0.67 mm broad, pronotum 0.57 mm long, maximum width 0.52 mm, elytra 1.95 mm long, 1.05 mm broad.

Description: Head black, pronotum reddish-black to black, elytra black with orange markings in form of broad postbasal transverse band more or less narrowly interrupted on suture and narrow oblique preapical spot on each elytron. Anterior pale band in holotype occupies almost the whole of the basal third, leaving only humeri narrowly black. Anterior pale marking bearing or not bearing lateral margin, posterior spot not bearing lateral margin. Antennae brown, 1-3 basal antennomeres yellow. Palpi yellow. Femora yellow, tibiae completely or partly darkened. Thorax orange or brown, abdominal ventrites black-brown, coxae and trochanters yellow. Head smooth and shiny dorsally, with very large prominent eyes. Tempora much shorter than the eye length, with rounded temporal angles. Base truncate. Punctures large and dense but flat, intervening spaces smaller than punctures. Pubescence whitish, long and dense. Antennae long and slender, in male reaching the feeble postbasal transverse impression of the elytra. Second antennomere 1/3 shorter than the next one. Antennomeres 3-9 elongate and slender, slightly thickened distally. Penultimate antennomere indistinctly shortened and thickened. Terminal antennomere elongate, pointed, 1/3 longer than the penultimate one. Terminal maxillary palpomere broadly cultriform. Pronotum smooth and shiny dorsally, rounded anteriorly, significantly narrower than the head, with shallow longitudinal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Figures 16-22. *Sapintus curvitibia* sp. nov. 16-20: Paratype ♂. 16 – Tergite VII; 17 – Sternite VII; 18 – Spiculum gastrale; 19 – Aedeagus; 20 – Tegmen of aedeagus. 21-22: Paratype ♀. 21 – Tergite VII; 22 – Sternite VII.


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impression on disc near anterior margin [very indistinct in some paratypes]. Postmedium strongly converged on sides toward narrow base. Punctures large, dense and coarse on disc, especially in basal half. Intervening spaces irregular but all much smaller than punctures. Antero-lateral angles smooth, almost impunctured. Pubescence whitish, fine, long and dense, suberect, with separate long erect setae on sides and disc. Scutellum triangular, pointed apically. Elytra elongate, weakly widened on sides postmedium, dorsally smooth and partly shiny. Postbasal transverse impression flat but quite well defined. Punctures very large, dense and coarse in basal half, intervening spaces irregular in size, smaller or much smaller than punctures. In apical fourth, punctures getting less coarse, but not much sparser. Pubescence yellowish, long and dense, suberect. Undersetae developed in apical 2/3 of elytral length, directed almost perpendicularly to lateral margin. Sutural striae broad, developed from apices toward postbasal transverse impression. Hind wings fully developed. Legs very long and slender. Male metatibiae slightly curved. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male is trapezoid, truncate on apical margin (Fig. 16). Morphological sternite VII in male is very short, very broadly rounded on apical margin (Fig. 17). The tegmen of the male aedeagus has a short and narrow, pointed apex (Figs 19-20). Morphological tergite VII in female is broadly rounded on apical margin (Fig. 21). Morphological sternite VII in female is broadly rounded on apical margin (Fig. 22).

Sexual dimorphism: Female metatibiae not or indistinctly curved, legs generally comparatively shorter. Antennae shorter and more stout in the female, antennomeres 3-9 less slender and more thickened distally.

Ecology & biology: The specimens were attracted to light. One paratypic specimen was collected at an altitude of 655 m.

Differential diagnosis: This species is very distinctive due to the shape of the pronotum (very strongly constricted laterally postmedium), slightly curved male metatibiae, very long male antennae and an appearance of shallow longitudinal impression on the anterior part of the pronotal disc.

Distribution: This species is only known from San Cristobal (= San Cristoval, = Makira), the easternmost main island of Solomon Archipelago.

Sapintus (s. str.) ***densepunctatus* sp. nov.** (Figs 23-27, map 3, plate 61 figs 1-2)

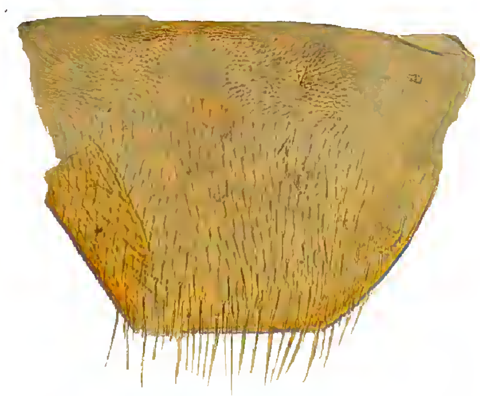
Holotype ♂ NME: INDONESIA Irian Jaya Nabire 100km W Yeretua Wondowoi Mts. VIII.1998 leg. M. Balke 100m üNN.

Paratype 1♂ NME: INDONESIA,Irian Jaya Nabire distr.,Wondiwol Mts.,Yeretua IX.1998,100 m NN leg. M. Balke.

Derivatio nominis: Named from a combination of the Latin 'dense' [densely, tightly] + 'punctatus' [punctate], because of the very densely punctured dorsal surface of the forebody.

Measurements, male: Total body length 3.24 mm, maximum combined width across the middle of elytra 1.07 mm. Head 0.60 mm long, across the eyes 0.66 mm broad, pronotum 0.70 mm long, maximum width 0.56 mm, elytra 1.94 mm long, 1.06 mm broad.

Description: Dorsum black, basal collar of pronotum yellowish brown, with two pairs of yellow spots on each elytron. Anterior spots somewhat oblique, situated in the basal third, not bearing lateral margin nor suture. Posterior spot pair irregular, ovoid, situated in apical third, also not bearing lateral margin nor suture. Antennomeres 1-4(5) yellow to yellowish brown, other antennomeres darkened (brown). Palpi and legs uniformly yellow. Underside brown, pro- and mesocoxae yellow, metacoxae reddish brown. All trochanters yellow. Head smooth and shiny dorsally, densely punctured, with large prominent eyes. Tempora short, straight, about 1/3 of the eye length. Temporal angles rounded. Head base truncate or subtruncate. Punctures various in size, intervening spaces mostly smaller than punctures except along head midline and on vertex, where punctures are distinctly sparser (but not smaller). Pubescence whitish, very fine and sparse. Antennae long and slender in male, reaching base of elytra. Male second antennomere short, about half the size of the next one. Male antennomeres 3-8 short and thickened distally in the paratype, slender and longer in the holotype. Male antennomeres 9-10 stronger, thickened distally and shorter than the previous ones. Terminal antennomere slightly asymmetric, bluntly conical, indistinctly longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum stout, very densely punctured dorsally, opaque, broadly rounded anteriorly, narrower than head. Narrowed postmedium laterally toward base. Punctures very dense but flat, intervening spaces ranging from smaller to much larger than punctures. Pubescence whitish, fine, sparse and appressed, with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Figures 23-27. *Sapintus densepunctatus* sp. nov., partype ♂. 23 – Tergite VII; 24 – Sternite VII; 25 – Spiculum gastrale; 26 – Aedeagus; 27 – Tegmen of aedeagus.

several long erect tactile setae on the sides and on the disc. Scutellum broadly rounded apically. Elytra elongate, smooth dorsally. Punctures large, coarse and dense, getting smaller and flat but not much sparser in apical third. Intervening spaces irregular but all smaller than punctures. Pubescence yellowish, fine, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae visible from apices toward basal third. Hind wings fully developed. Frontal margins of mesepisterna with a fringe of long setae directed upwards; these setae are exposed from under the humeri in the dorsal view. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male broadly trapezoid, truncate on apical margin (Fig. 23). Morphological sternite VII in male is short and broad, truncate on apical margin (Fig. 24). Male aedeagus with tegmen prolongate apically, rounded (Figs 26-27).

Sexual dimorphism: Female is unknown.

Ecology & biology: This species was collected in pristine lowland rainforest at an altitude of 100 m.

Differential diagnosis: This species is very close to *S. dyaulensis* Telnov (see nomen novum below) from New Guinea and the Bismarck Archipelago, but differs in the finely punctured forebody and the less prolongate tegmen apex of the male aedeagus. Also very similar to widespread and variable *S. vexator* Werner (Central and southern Pacific, Papuan region, coastal SE Asia, Sri Lanka). First, the basal piece of the aedeagus is longer in *S. vexator* (longer than the tegmen) and shorter in *S. densepunctatus* (shorter than or as long as the tegmen). Second, the hooks at the base of the tegmen are much less developed and less sclerotized in *S. densepunctatus* than in *S. vexator*. Third, the dorsal intervening spaces on the head are not microreticulate in *S. densepunctatus,* but are almost always microreticulate in *S. vexator* (these characteristics given confusedly by Werner (1964: 264-265): first as '... intervals finely but distinctly microreticulate throughout' (p. 264, description), than as '... often microreticulate intervals ...' (p. 265, diagnose). In all the *S. vexator* specimens I've examined, the intervening spaces on the head were at least partly microreticulate.

Distribution: The species is known from the surroundings of Nabire in the northern Bird's Neck isthmus of New Guinea.

Remarks: The correct spelling of the collecting locality is Wondowoi Mountains and not 'Wondiwol', as is written on the paratype's label.

Sapintus (s. str.) ***dilensis*** (Pic, 1900) (Figs 28-34, maps 2 & 4 [partial distribution], plates 47, 55 figs 6-7)
= *Anthicus dilensis* var. *Csikii* Pic, 1902
= *Sapintus relatus* Bonadona, 1981 [consider new synonymy above]

Lectotype ♀ MSNG [herewith designated]: N.Guinea Dilo LoriaVI.VII.90 [printed, black border] / Typus [printed, label red, black border] / dilensis Pic [handwritten, black border] / A. dilensis Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Paralectotype 1 specimen MNHN [herewith designated]: N.Guinea Dilo LoriaVI.VII.90 [printed, black border] / TYPE [printed, label red] / A. dilensis Pic [handwritten].

Holotype ♀ *Anthicus dilensis* var. *Csikii* HMNH: N. Guinea Biró 96 [printed] / Erima Astrolabe B. [printed] / Holotypus [printed, text red] 1902 Anthicus Csikii Pic [handwritten, red border] / A. dilensis Pic var [handwritten] / Csikii Pic [handwritten] / Anthicus Csikii Pic [handwritten] det.M. Pic [printed] Typus ! [handwritten, text red].

Paratypes 2 specimens *Anthicus dilensis* var. *Csikii*: 1♂ HMNH: N. Guinea Biró 97. [printed] / Erima Astrolabe B. [printed] / Paratypus [printed, text red] 1902 Anthicus Csikii Pic [handwritten, red border] / dilensis var Csikii Pic [handwritten]; 1 specimen DCC: N. Guinea Biró 96 [printed] / Friedrich-Wilh.-hafen [printed] / 3104 [printed] / Paratypus [printed, label red] 1902 Anthicus Csikii Pic [handwritten, red border].

Holotype ♂ *Sapintus relatus* ZMUC: Bismarck Islands, Lavongai, Banatam 21. March 1962 Noona Dan Exp. 61-62 [printed] / HOLOTYPE [printed, label red] / Sapintus relatus n.sp [handwritten] P.Bonadona dét. 19[printed] 78 [handwritten].

Additional material: 1 specimen OUNH: N. Gui Wallace / Coll.(1830-73) WWSaunders Ex coll.H.E. Cox. dd.1916 Mrs.Cox / Hope Entomological Collection Ex. Cabinet 6, drw 9; 1 specimen MNHN: N. Guinea Biró 96 / Friedrich-Wilh.-hafen / **3106**; 1 specimen MNHN: N. Guinea Biró 1898 / Stephansort Astrolabe Bai [sic!] / **3105** / Ant. dilensis Pic var. / Csikii Pic; 2 specimens BMNH: Stn. No. 116. / NEW GUINEA: Morobe Dist., Lae. 10.xii. 1964 / M.E. Bacchus. B.M. 1965-120; 5 specimens ZSM: 30 IX 79 PNG/Morobe Umg. Kaiapit / Sapintus dilensis (Pic) det.G.Uhmann1989; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light Misc 8 10-III-1993 Leg Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light M1 18-III-1993 Leg Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light XG 25-IV-1996 Leg Olivier Missa; 1 specimen DTC: <u>Coll. I.R.Sc.N.B.</u> Canopy mission P.N.G. Madang province Baileta, LIGHT AR 14 4.V.1996 Leg. Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light M1 3-VI-1996 Leg Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> Canopy mission P.N.G. Madang province Baileta, Light AR22 12.VI.1996 Leg. Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light X P 18-IV-1996 Leg Olivier Missa; 1 specimen IRSN: <u>Coll. I.R.Sc.N.B.</u> PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light AR 60 03-VII-1996 Leg Olivier Missa; 1 specimen NME, 1 specimen DTC: INDONESIA,Irian Jaya Jayapura distr. Genyem,50m NN;IV.-V.1999,leg.M.Balke; 3 specimens NME, 1 specimen DTC: PNG: E New Britain Prov. 30km SW Kokopo, Arabam, 200m 04°35'75"S 152°06'84"E 21.II.-04. III.2000 leg. A. Weigel KL; 1 specimen NME: PNG: E New Britain Prov. 30km SW Kokopo, Arabam, 200m 04°35'75"S 152°06'84"E 21.II.2000 leg. A. Weigel Dorf LF; 1 specimen NME: PAPUA – NEUGUINEA E New Britain Prov. 30km SW Kokopo vic. Arabam, S,200m, S 04°35'75", E 152°06'64" 25.II.2000, KL, leg. A.Weigel, sec. forest; 1 specimen NME: W-PAPUA Raja Ampat Prov. Batanta Isl. mer., Wallebet 0°54'01"S, 130°39'37"E, 18.-21.I.2004 leg. A.Skale; 1 specimen NME, 46 specimens NME & DTC: W-PAPUA,Manokwari Pr.,14km NE Ransiki Warbiati (Oransbari) / light trap,01°18.41'S 134°14.24'E,cut.area 02.III.2007 leg. A. Weigel; 1 specimen NME: W-PAPUA Manokwari Prov. Ransiki, Motel, 01°30.37'S 134°10.27'E, 02.III.2007 leg. A.Skale at light; 1 specimen DTC: W-PAPUA Manokwari Prov.6km N Manokwari, Desa Pami, 180m 0°48.34'S, 134°03.15'E 09.III.2007, leg. A.Skale; 6 specimens DTC: **INDONESIA**, prov. Maluku Utara (North Moluccas), Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N 127°54'27,18"E, 09.IX.2007, plantations, UV light, leg. D.Telnov & K.Greķe; 1 specimen DTC: **INDONESIA**, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. S env., Tilope vill. 15-18 km SW, Oham, 0°14'46,74"N 127°52'38,19"E, ~150 m, 13-14.IX.2007, primary lowland forest, UV light, leg. D.Telnov & K.Greķe; 2 specimens DTC: **INDONESIA**, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Wairoro vill. ~10 km W, Gunung Benteng mt. ridge, 0°12'20,19"N 127°48'44,87"E, 150-450 m, 18-20.IX.2007, primary rain forest, river valley, UV light, leg. D.Telnov & K.Greķe; 7 specimens DTC: **INDONESIA**, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Wairoro vill. ~10 km W, Gunung Benteng mt. ridge, 0°12'20,19"N 127°48'44,87"E, 150-450 m, 19.IX.2007, primary rain forest, small clearing, beaten, leg. D.Telnov & K.Greķe; 1 specimen DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 07.IX.2010, edge of primeval lowland rainforest on limestone, UV light, leg. D.Telnov; 5 specimens DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 08.IX.2010, edge of primeval lowland rainforest, white light, leg. D.Telnov; 10 specimens DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 09.IX.2010, edge of primeval lowland rainforest, white light, leg. D.Telnov; 3 specimens DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 09.IX.2010, edge of primeval lowland rainforest, white light, leg. M.Kalniņš; 13 specimens DTC: **INDO-**

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Figures 28-34. *Sapintus dilensis* (Pic, 1900). 28-32: ♂ from Triton Bay, Indonesian New Guinea. 28 – Tergite VII; 29 – Sternite VII; 30 – Spiculum gastrale; 31 – Aedeagus; 32 – Tegmen of aedeagus. 33-34: ♀ from Waisai env., Waigeo Island, Raja Apmat. 33 – Tergite VII; 34 – Sternite VII.

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NESIA E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 10.IX.2010, edge of primeval lowland rainforest, white light, leg. D.Telnov; 7 specimens DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 47 km E, Triton Bay, Kamaka (former Warika) vill., 3°46'42"S, 134°10'24"E, 50 m, 10.IX.2010, edge of primeval lowland rainforest, white light, leg. M.Kalniņš; 1 specimen DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 40 km E, Triton Bay, Lobo vill. & env., 3°45'33"S, 134°06'11"E, 15 m, 12.IX.2010, secondary rainforest & gardens on limestone, white light, leg. M.Kalniņš; 1 specimen DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 40 km E, Triton Bay, Lobo vill. & env., 3°45'33"S, 134°06'11"E, 15 m, 14.IX.2010, secondary rainforest & gardens on limestone, white light, leg. D.Telnov; 2 specimens DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 40 km E, Triton Bay, Lobo vill. & env., 3°45'42"S, 134°05'40"E, 15 m, 15.IX.2010, secondary rainforest on limestone, UV light, leg. D.Telnov; 1 specimen DTC: **INDONESIA** E, West PAPUA, S Bird's Neck, Kaimana 40 km E, Triton Bay, Lobo vill. & env., 3°45'33"S, 134°06'11"E, 15 m, 16.IX.2010, secondary rainforest & gardens on limestone, white light, leg. D.Telnov; 2 specimens DTC: **INDONESIA** E, Raja Ampat, Waigeo Island, Waisai 2-3 km W, 00°25'40"S, 130°47'36"E, ~70 m, 16-17.II.2012, secondary lowland rainforest on limestone, MV light, leg. D.Telnov; 25 specimens DTC: **INDONESIA** E, Raja Ampat, Waigeo Island, Waisai 3 km W, 00°26'04"S, 130°47'41"E, 40-50 m, 18.II.2012, secondary lowland rainforest on limestone & clearing, MV light, leg. D.Telnov; 32 specimens DTC: **INDONESIA** E, Raja Ampat, Waigeo Island, Waisai 3 km W, 00°26'04"S, 130°47'41"E, 40-50 m, 20.II.2012, secondary lowland rainforest on limestone & clearing, MV light, leg. D.Telnov.

This redescription is based on a male specimen from Waigeo Island, Raja Ampat, Indonesia.

Measurements, lectotype ♀: Total body length 2.75 mm, maximum combined width across the middle of elytra 0.86 mm. Head 0.54 mm long, across the eyes 0.60 mm broad, pronotum 0.50 mm long, maximum width 0.51 mm, elytra 1.71 mm long, 0.86 mm broad. Holotype ♀ *Anthicus dilensis* var. *Csikii*: Total body length 2.49 mm, maximum combined width across the middle of elytra 0.81 mm. Head 0.50 mm long, across the eyes 0.55 mm broad, pronotum 0.48 mm long, maximum width 0.46 mm, elytra 1.51 mm long, 0.81 mm broad. ♂ from Manokwari surroundings, Indonesian New Guinea: Total body length 2.75 mm, maximum combined width across the middle of elytra 0.90 mm. Head 0.60 mm long, across the eyes 0.60 mm broad, pronotum 0.50 mm long, maximum width 0.47 mm, elytra 1.65 mm long, 0.90 mm broad.

Description: Forebody brown, dark reddish brown or black. Elytra black with yellow or orange markings consisting of a broad postbasal transverse band and narrower oblique ^-shaped transverse band in the apical third. The anterior band is usually complete while the posterior one is often narrowly interrupted on the suture. Antennae pale – yellowish or orange; in some specimens only the basal antennomeres 1-4 are pale, while the rest are darkened. Maxillary palpi yellow. Legs yellow or black, with partly yellow tibiae. Underside uniformly brown, reddish brown or black-brown, pro- and mesocoxae and all trochanters pale. Head smooth and somewhat shiny, with midsized prominent eyes. Tempora about a half of the eye length, with rounded temporal angles. Head base truncate. Punctures of two sizes: basic punctures large and flat with intervening spaces equal to or twice as large as punctures. Especially on the frons, intervening spaces between large punctures covered by small and dense punctures. Vertex sparsely punctured, more shiny. Pubescence fine, yellowish, quite long and dense. Antennae long, almost reaching the middle of the elytra in the female. Second antennomere about 1/3 shorter than the next one. Antennomeres 3-7 elongate, slightly thickened distally. Antennomeres 8-10 shorter and stronger, thickened distally. Terminal antennomere asymmetric, elongate, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum dorsally not or partly smooth, flattened, broadly rounded anteriorly, narrower than the head. Strongly narrowed postmedium laterally toward narrow base. Punctures of two sizes: larger ones mostly present on anterior half and with intervening spaces ranging from smaller than to as large as these punctures. Between larger punctures, and especially in the basal half, there are dense, much smaller punctures, which get extremely dense at the base, to the extent of almost not leaving visible spaces in between. Punctures less dense on antero-lateral margins. Pubescence yellowish, fine, dense and long, with numerous long erect tactile setae on the sides and on the disc. Scutellum narrowly truncate apically. Elytra elongate, smooth and shiny. Punctures large and dense in basal half, getting smaller and sparser postmedially. Intervening spaces irregular, in basal half mostly smaller, in postmedian half 2-3 times larger than punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae almost complete, visible from basal fourth toward apices. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male truncate (rarely feebly excavate) and densely setose on apical margin (Fig. 28). Morphological sternite VII in male broadly rounded and densely setose on apical margin (Fig. 29). Male aedeagus with elongate and apically rounded apex, basal piece slightly longer than parameres (Figs 31-32). Morphological tergite VII in female broadly rounded on apical margin (Fig. 33). Morphological sternite in female broadly rounded on apical margin (Fig. 34).

Sexual dimorphism: Not indicated, but the antennomeres are comparatively shorter in females.

Variability: This species is variable in body length and colouration. Certain specimens are completely black coloured with pale markings on the elytra. Other specimens have a pale orange forebody and a brown elytra (with markings). Elytral markings can be yellow, orange or orange-red. The posterior pale band of the elytra can be more or less broadly interrupted on the suture. Leg colour varies from black to yellow, and the coxae and trochanters can be darkened in some specimens. Body size varies 2.40 - 2.80 mm.

Distribution: This species is widespread in the Indo-Australian transition zone but was not yet recorded outside this region. Hitherto confirmed from North (Halmahera Island), Raja Ampat Islands (Batanta & Waigeo islands), Indonesian Papua (Bird's Head Peninsula & northern coast of Bird's Neck isthmus), Papua New Guinea (Papuan Peninsula, Madang & Morobe Provinces), and Bismarck Archipelago (Lavongai & New Britain islands).

Sapintus (s. str.) ***dyaulensis*** Telnov (Figs 35-36, maps 2-3, plate 61 figs 3-5)

= *Sapintus propinquus* Bonadona, 1981 [consider name change above]

Holotype ♂ ZMUC: Bismarck Isl. Dyaul Sumuna 4. March 1962 Noona Dan Exp. 61-62 [printed] / Caught by Mercury – light [printed] / HOLOTYPE [printed, label red] / Sapintus propinquus n.sp [handwritten] P.Bonadona dét. 19[printed] 78 [handwritten].

Additional material: 1 specimen NME: Indonesia, Irian Jaya, Nabire 100 km W Yeretua, Wondowoi Mts., VII.1998, leg. M.Balke, 100 m üNN.

This redescription is based on a male specimen from the Nabire surroundings, Indonesian New Guinea.

Measurements, ♂ from Nabire surroundings, Indonesian Papua: Total body length 3.51 mm, maximum combined width postmedium of elytra 1.20 mm. Head 0.67 mm long, across the eyes 0.71 mm broad, pronotum 0.67 mm long, maximum width 0.61 mm, elytra 2.17 mm long, 1.20 mm broad.

Description: Dorsal surface dark brown. Elytra with pale markings, consisting of one postbasal and one preapical yellowish transverse or oblique spot on each elytron, distinctly interrupted on the suture and also not reaching lateral margins. Spots vary in size and form, the anterior pair is almost completely reduced in the specimen from the Nabire surroundings. Two basal antennomeres yellow, the rest of the antennae pale brown. Legs yellow with basal half of all tibiae darkened. Head smooth dorsally on intervening spaces, with very large prominent eyes occupying almost the whole sides of the head. Tempora about 1/4 of the eye length, with rounded temporal angles. Head base truncate. Punctures large and deep, intervening spaces smooth and smaller than punctures. Vertex is not much more sparsely punctured than the frons. Pubescence whitish, fine and long, dense. Antennae comparatively short and slender, reaching over the base of the elytra in the male. Second antennomere in male short, half the size or less of the third antennomere. Antennomeres 3-7 elongate and slender [three ultimate antennomeres missing in the Nabire specimen and also not described in detail by Bonadona (1981)]. Terminal maxillary palpomere axeform. Pronotum smooth dorsally on intervening spaces, rounded anteriorly, significantly narrower than the head, with a distinct lateral postmedian transverse impression. Punctures generally larger and denser than on the head, dense and coarse, intervening spaces much smaller than punctures. Pubescence whitish, fine, dense and long, with separate long erect tactile setae on the sides and on the disc. Scutellum truncate apically. Elytra elongate, smooth and shiny. Punctures large and dense in basal half, getting smaller and sparser postmedium. Intervening spaces irregular in size – ranging from smaller than the punctures in the basal half to as large as those in the postmedian half. Pubescence whitish, long but not very dense, appressed. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Male aedeagus long, tegmen strongly elongated to the apex, finely setose laterally preapically (Figs 35-36) [last ventrites were not available for this study].

Sexual dimorphism: Female is unknown.

Figures 35-36. *Sapintus dyaulensis* nom. nov. ♂ from Nabire env., Indonesian New Guinea. 35 – Aedeagus; 36 – Tegmen of aedeagus.

Ecology & biology: Collected at altitudes of ~100 m.
Distribution: The species is possibly widespread on New Guinea. Hitherto known from Dyaul Island (also known as Djaul) in the Bismarck Archipelago and from the Nabire area (northern Bird's Neck isthmus, Indonesian New Guinea).

Sapintus (s. str.) ***geminus* sp. nov.** (Figs 37-43, map 3, plate 46 figs 5-6)
Holotype ♂ IRSN: Coll. I.R.Sc.N.B. PAPUA NEW GUINEA Madang Province Baiteta-LICHT AR T2 24 III 1993 Leg. Olivier Missa [printed, label orange].
Paratype 1♀ IRSN: Coll. I.R.Sc.N.B. PAPUA NEW GUINEA Canopy Mission Madang Province Baiteta Light AR 16 04-VI-1996 Leg Olivier Missa [printed, label orange].

Derivatio nominis: Named from the Latin 'geminus' [very similar, twin], because of outstanding morphological similarity with the Papuan *Sapintus horvathi* (Pic, 1902).
Measurements, holotype ♂: Total body length 2.80 mm, maximum combined width across the middle of elytra 0.80 mm. Head 0.62 mm long, across the eyes 0.57 mm broad, pronotum 0.64 mm long, maximum width 0.47 mm, elytra 1.50 mm long, 0.80 mm broad. Measurements, paratype ♀: Total body length 2.55 mm, maximum combined width across the middle of elytra 0.78 mm. Head 0.60 mm long, across the eyes 0.52 mm broad, pronotum 0.50 mm long, maximum width 0.41 mm, elytra 1.42 mm long, 0.78 mm broad.
Description: Head brown, mouth parts yellow. Pronotum brown, paler on base. Elytra black or black-brown with pale markings. These markings consist of a yellow postbasal transverse band and a transverse spot in the apical third of each elytron, not bearing their lateral margin. Antennae brown, 3-4 terminal antennomeres slightly paler. Legs brown, all male femora and female mesofemora yellow in basal part. Underside reddish-brown or brown, trochanters and coxae generally paler. Head smooth and shiny, with midsized prominent eyes. Tempora slightly shorter than the eye length, very broadly rounded on temporal angles together with base. Punctures deep and dense, intervening spaces smaller than punctures. The vertex is much more sparsely and finely punctured than the frons. Pubescence yellowish, fine and long. Antennae long and slender, reaching slightly over the elytral humeri in the male. Second antennomere in male 1/5 shorter than the next one. Antennomeres 3-8 elongate and slender. Antennomeres 8-10 slightly shortened and thickened distally. Terminal antennomere asymmetric, conical, pointed, 1/3 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum broadly rounded anteriorly, significantly narrower than the head, strongly constricted postmedium laterally toward narrow base. Very densely punctured on the disc, with punctures becoming very large and coarse in the basal half. Intervening spaces ranging from smaller to much smaller than punctures. Antero-lateral margins smooth, minutely and sparsely punctate. Pubescence yellowish, fine, long and sparse, appressed, with separate very long erect tactile setae on the sides and on the disc. Scutellum narrowly elongate, rounded apically. Elytra elongate and slightly widened across the middle, smooth dorsally. Humeri rounded. Feeble but distinct postbasal transverse impression present. Punctures variable in size, sparse, getting smaller in the apical third. Intervening spaces irregular in size, ranging from as large to twice as large as the punctures. Pubescence yellowish, long and sparse, suberect. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward postbasal transverse impression. Hind wings fully developed. Legs long and slender. Male metatibiae slightly thickened. Male basal tarsomere of

the metathoracic legs is longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male is trapezoid, truncate on apical margin and covered with long setation (Fig. 37). Morphological sternite VII in male is short, broadly rounded on apical margin and covered with long setation (Fig. 38). The male aedeagus has a spatulate tegmen, which is pubescent preapically (Figs 40-41). Morphological tergite VII in female broadly rounded on apical margin (Fig. 42). Morphological sternite VII in female short and broad, broadly rounded and densely setose on apical margin (Fig. 43).

Sexual dimorphism: The metatibiae are slender in the female and the tempora are comparatively shorter.

Variability: The forebody is less coarse and densely punctured in the female, except for the basal half

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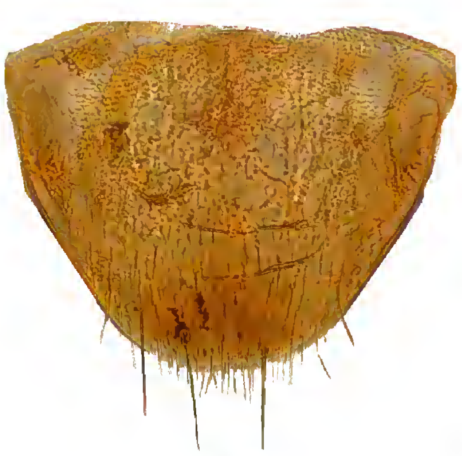
Figures 37-43. *Sapintus geminus* sp. nov. 37-41: Holotype ♂. 37 – Tergite VII; 38 – Sternite VII; 39 – Spiculum gastrale; 40 – Aedeagus; 41 – Tegmen of aedeagus. 42-43: Paratype ♀. 42 – Tergite VII; 43 – Sternite VII.



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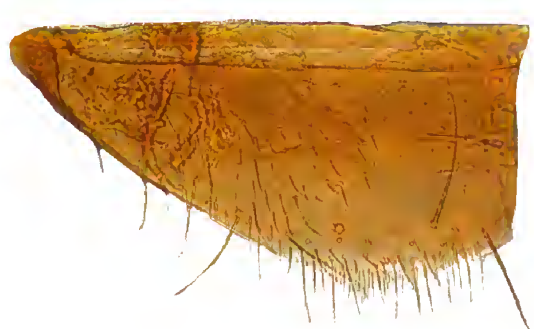

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of the pronotum. The posterior pale spots of the elytra are very narrow (strongly transverse) in the female. The femora are darker in the female (basal yellow colouration reduced).

Ecology & biology: This species is very close to *S. horvathi* (Pic, 1902) (New Guinea & Central Moluccas) and is distinctive because of the shape of the male tegmen (not pointed apically, opposite pointed in *S. horvathi*) and comparatively longer tempora and broadly rounded head base (tempora are shorter in *S. horvathi* and the head base is generally less broadly rounded). Moreover, the antennae are somewhat shorter in the new species, not reaching the postbasal transverse impression of the elytra.

Distribution: This species is known from the eastern edge of Adelbert Range in Madang Province, Papua New Guinea.

Sapintus (s. str.) ***gemitus*** **sp. nov.** (Figs 44-50, map 5, plate 48 figs 1-3)

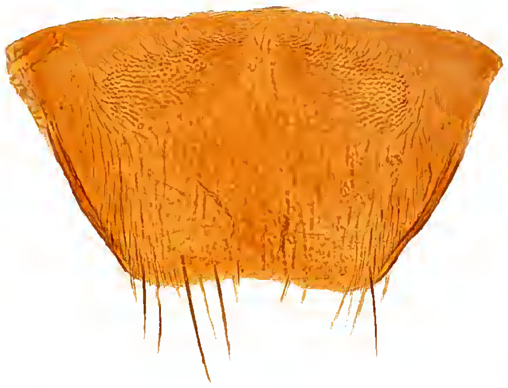
Holotype ♂ BMNH: Vert.Series 1m actinic code: [printed] 15.III.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281.

Paratypes 16 specimens: 1 specimen BMNH: At MV light / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 1m actinic code: [printed] 14.II.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 S.L.Sutton C.J.Rees B.M.1980-281; 3 specimens BMNH: Vert.Series 1m actinic code: [printed] 15.II.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / Vert.Series 1m actinic code: [printed] 17.II.80 [handwritten] / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / Vert.Series 1m actinic code: [printed] 18.ii.80 [handwritten] / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / Vert.Series 1m actinic code: [printed] 23.II.80 [handwritten] / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 1m actinic code: [printed] 4.III.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 3 specimens BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / Vert.Series 1m actinic code: [printed] 14.III.80 [handwritten] / S.L.Sutton C.J.Rees B.M.1980-281; 3 specimens BMNH: Vert.Series 1m actinic code: [printed] 16.III.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 30m.actinic code: [printed] 16.III.80 [handwritten] / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.i.-20.iv.1980 / S.L.Sutton C.J.Rees B.M.1980-281 / 408.

Derivatio nominis: Named from the Latin 'gemitus' [sigh, groan], in honour of all taxonomists doing the often routine work of naming and describing, *describing,* **describing** new taxa.

Measurements, holotype ♂: Total body length 3.51 mm, maximum combined width across the middle of elytra 1.12 mm. Head 0.71 mm long, across the eyes 0.70 mm broad, pronotum 0.65 mm long, maximum width 0.53 mm, elytra 2.15 mm long, 1.12 mm broad. Measurements, paratype ♀: Total body length 3.35 mm, maximum combined width across the middle of elytra 1.05 mm. Head 0.69 mm long, across the eyes 0.70 mm broad, pronotum 0.65 mm long, maximum width 0.51 mm, elytra 2.01 mm long, 1.05 mm broad.

Description: Dorsum red to orange-red. Elytra with black markings consisting of a small humeral spot, a large median spot (bearing or not bearing the lateral margin of the elytra) and a large apical spot. Antennae, palpi and legs pale orange to yellow, tibiae somewhat darkened basally. Underside uniformly orange-red. Head smooth and shiny, with large prominent eyes. Tempora slightly converged toward base, about half of the eye length, broadly rounded on temporal angles. Head base truncate. Punctures variable in size, deep and large but sparse, intervening spaces ranging from smaller than (on frons) to twice as large (on the vertex) as punctures. Pubescence yellowish, fine and long. Antennae long and slender, reaching the area of postbasal transverse impression of elytra in the male. Second antennomere in male half the size of the third antennomere. Antennomeres 3-10 elongate and slender; of these 9-10 are slightly shortened. Terminal antennomere elongate, conical, pointed, about as long as the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum elongate, smooth dorsally, broadly rounded anteriorly, significantly narrower than the head, narrowed postmedium laterally toward base. Very densely and coarsely punctured on disc. Intervening spaces ranging from smaller to much smaller than punctures. Antero-lateral angles smooth, minutely and sparsely punctate. Pubescence yellowish, long and dense, with several very long erect tactile setae on the sides and on the disc. Scutellum truncate apically. Elytra elongate and slightly widened across middle, smooth and shiny dorsally. Punctures large, deep and coarse in the basal half, getting smaller and more flat in the apical half. Intervening spaces smaller than the punctures in the basal half, getting slightly larger in the apical third. Pubescence yellowish, long and sparse, suberect. Undersetae directed obliquely laterally. Sutural striae broad, complete. Hind wings fully developed. Legs long and slender. Basal tarsomere of the metathoracic legs in both sexes about as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in the male is trapezoid, truncate or feebly excavated on the apical margin, covered with long setae (Fig. 44). Morphological sternite VII in male is short, broadly rounded on the apical margin and covered with long setation (Fig. 45). The male aedeagus is slender, elongate and pointed apically, with setose tegmen (Fig. 47-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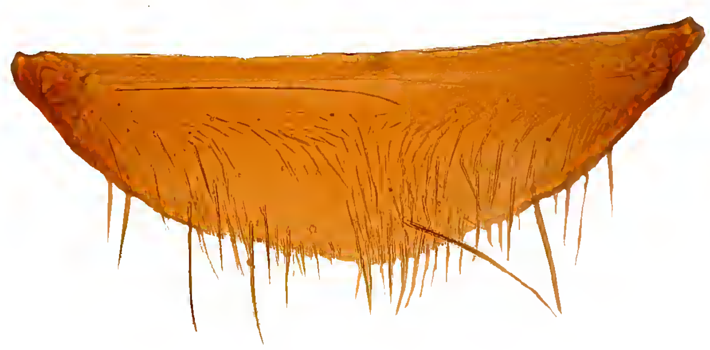
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Figures 44-50. *Sapintus gemitus* sp. nov. 44-48: Holotype ♂. 44 – Tergite VII; 45 – Sternite VII; 46 – Spiculum gastrale; 47 – Aedeagus; 48 – Tegmen of aedeagus. 49-50: Paratype ♀. 49 – Tergite VII; 50 – Sternite VII.


49


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48). Morphological tergite VII in female is narrowly rounded on the apical margin (Fig. 49). Morphological sternite VII in female is broadly rounded on the apical margin (Fig. 50).
Sexual dimorphism: Almost not indicated. The intermediary antennomeres (3-8) are comparatively shorter in the female.
Variability: The punctures of dorsum are variable in size and density. The black markings of the elytra vary strongly in shape and size.
Ecology & biology: Collected in primary tropical rainforest, attracted to light.
Differential diagnosis: This species is similar to *S. subrubrocinctus* (Marseul, 1882a) (Sumatra) due to the body colouration and general appearance. The holotype of Marseul's species is a female, other identifications made by Uhmann (from Borneo, Nias, Peninsular Malaysia) need further confirmation. Consequently, I was unable to compare the male genital organs of both species. The head base is broadly rounded in *S. subrubrocinctus* (truncate in *S. gemitus*) and the Sumatran species is a bit larger (4.0 mm compared to ~3.50 mm in *S. gemitus*), otherwise the two species look very similar.
Distribution: This species is known from Central Sulawesi.

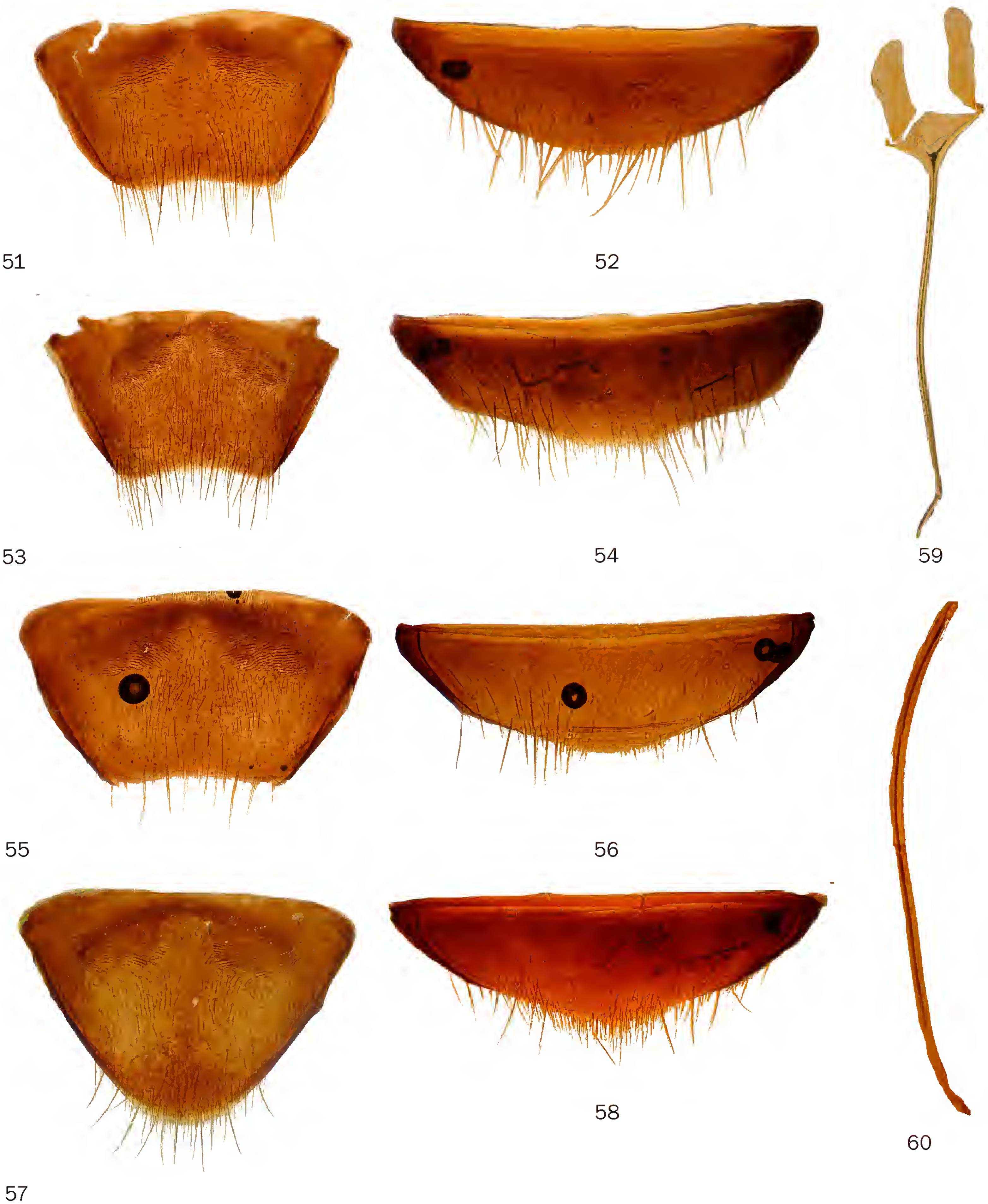
Sapintus (s. str.) ***gracilicornis*** (Pic, 1895) (Figs 51-65, plates 49, 50, 56 figs 5-6)
= *Anthicus gracilicornis* v. *semiobliteratus* Pic, 1900 [consider new synonymy above]
= *Anthicus neoguineensis* Pic, 1900 [consider new synonymy above]
= *Sapintus repentinus* Bonadona, 1981 [consider new synonymy above]
Holotype ♀ *Sapintus gracilicornis* MNHN: ○ [small circular purple label without text] / Balabac (Staudinger) [handwritten] / pres hirtisetosus Mars [handwritten] / Type [handwritten] / TYPE [printed, label red] / a. gracilicornis Pic n sp. [handwritten].
Holotype ♀ *Anthicus neoguineensis* MSNG: N.Guinea Dilo LoriaVI.VII.90 [printed, black border] / Typus [printed, text red, red border] / neoguineensis Pic [handwritten, black border] / Anthicus neoguineensis Pic typus ! [handwritten] / Mus. Civ. Genova [printed].
Lectotype ♀ *Anthicus gracilicornis* var. *semiobliteratus* MSNG [herewith designated]: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten] / TYPE [printed, label red] / v. semiobliteratus Pic [handwritten].
Paralectotype ♀ *Anthicus gracilicornis* var. *semiobliteratus* MNHN [herewith designated]: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten] / TYPE [printed, label red] / v. semiobliteratus Pic [handwritten].
Holotypus ♂ *Sapintus repentinus* ZMUC: Philippines, Tawi Tawi Tarawakan north of Batu Batu 13. Nov. 1961 Noona Dan Exp. 61-62 [printed] / HOLOTYPE [printed, label red] / Sapintus repentinus n.sp [handwritten] P.Bonadona dét. 19[printed] 78 [handwritten].
Paratypus ♀ *Sapintus repentinus* ZMUC: Philippines, Tawi Tawi Tarawakan north of Batu Batu 15. Nov. 1961 Noona Dan Exp. 61-62 [printed] / Caught by Mercury - light [printed] / ALLOTYPE [printed, label red] / Sapintus repentinus n.sp [handwritten] P.Bonadona dét. 19[printed] 78 [handwritten].
Additional material: 2 specimens MNHN: ○ [small circular purple label without text] / Balabac (Staudinger) [handwritten] / pres hirtisetosus Mars [handwritten] / a. gracilicornis Pic n sp. [handwritten]; 2 specimens MNHN: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border]; 27 specimens MSNG: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border]; 1 specimen DTC: S.Celebes / ♀ / 99370 / subrubrocinctus det. V.Krekich; 2 specimens MHUB: D. N. Guinea 96 Hauptlager b. Malu Kais.Augustafluß Exp. 3.VII.12. Bürgers S.G. / Zool. Mus. Berlin / Sapintus gracilicornis (Pic) det.G.Uhmann1991; 1 specimen MHUB: D. N. Guinea 97 Hauptl. b. Malu 10.-30.VI.12 Bürgers S.G. / Zool. Mus. Berlin / Sapintus gracilicornis (Pic) det.G.Uhmann1991; 2 specimens MHUB: D. N. Guinea 99 Kais.Augustafluß Exp. VII.12. Bürgers S.G. / Zool. Mus. Berlin / Sapintus gracilicornis (Pic) det.G.Uhmann1991; 1 specimen BMNH: NEW GUINEA: Papua. J.B. Jackson. B.M. 1938-496.; 2 specimens BMNH: Hollins Is. Asau, Savaii 24.xi.68 A.K.Walker / x coconut log / UN/6PC 1608 /Hocking Colln B.M. 1980-386; 2 specimens BMNH: Hollins Is. Samoa 26 XII 1968 B. Hockking SWEEPT / Anthicus oceanicus Laf. / Hocking Colln B.M. 1980-386; 1 specimen BMNH: Vert.Series 1m.actinic code: 16.III.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281 / Anthicidae R.J.W. Aldridge det. 1982 / 400; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / Vert.Series 1m.actinic code: 14.III.80 / S.L.Sutton C.J.Rees B.M.1980-281; 2 specimens BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / Vert.Series 1m. actinic 18.II.80 / S.L.Sutton C.J.Rees B.M.1980-281; 6 specimens BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / Vert.Series 1m. actinic code: 22.II.80 / S.L.Sutton C.J.Rees B.M.1980-281; 3 specimens BMNH: Vert.Series 1m.actinic code: 16.III.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 2 specimens BMNH: Vert.Series 1m.actinic code: 19.II.80 / SULAWESI TEN-

GAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 1m.actinic code: 28.II.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 3 specimens BMNH: Vert.Series 1m.actinic code: 10.III.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 1m.actinic code: 28.II.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281 / Anthicidae R.J.W. Aldridge det. 1982; 1 specimen BMNH: Vert.Series 1m. actinic code: 14.II.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281 / Anthicidae R.J.W. Aldridge det. 1982; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / Vert.Series 1m.actinic code: 23.II.80 / S.L.Sutton C.J.Rees B.M.1980-281; 1 specimen BMNH: Vert.Series 1m.actinic code: 14.II.80 / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / S.L.Sutton C.J.Rees B.M.1980-281; 36 specimens BMNH: Lowland rain forest. / At light / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / M.J.D.Brendell B.M.1980-280; 2 specimens BMNH: Lowland rain forest. / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / M.J.D.Brendell B.M.1980-280; 1 specimen BMNH: At light / SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / M.J.D.Brendell B.M.1980-280; 1 specimen BMNH: SULAWESI TENGAH: Nr.Morowali, Ranu River Area. 27.I.-20.IV.1980 / M.J.D.Brendell B.M.1980-280; 2 specimens DTC: Borneo, Sarawak Niah Caves N.P. 13°46'E 3°48'N 25.4.-3.5.1981, leg. Bogenberger / Sapintus oceanicus (Laf.) det.G.Uhmann19; 1 specimen DTC: Borneo, Sarawak, Niah Caves N.P. 25.IV-3.V.1981, leg. Bogenberger 1 specimen BMNH: flood refuse / Banks of R.Tumpah / Lowland forest ca 200m. / INDONESIA : SULAWESI UTARA, Dumoga-Bone N.P. January 1985. / R.Ent.Soc. Lond. PROJECT WALLACE B.M. 1985-10; 1 specimen BMNH: Site 2, 200m Toraut bank J.D.Holloway 29-31.I.1985 / R.Ent.Soc.Lond. PROJECT WALLACE B.M. 1985-10 / INDONESIA : SULAWESI UTARA, Dumoga-Bone N.P. January 1985. / 112.21; 1 specimen BMNH: flood refuse / Banks of R.Tumpah / Lowland forest ca 200m. / INDONESIA : SULAWESI UTARA, Dumoga-Bone N.P. January 1985. / R.Ent.Soc.Lond. PROJECT WALLACE B.M. 1985-10; 2 specimens BMNH: INDONESIA : SULAWESI UTARA, Dumoga-Bone N.P. January 1985. / At light / Base camp area ca 190m / R.Ent.Soc.Lond. PROJECT WALLACE B.M. 1985-10; 2 specimens MSNG: SULAWESI UT. Dumoga-Bone Base Camp Sweeping 18.V.1985 Franciscolo; 2 specimens DTC: PHILIPPINES,PANAY 10 KM E SIBALOM 10.DEC 1990 BOLM LGT. 100 M; 1 specimen DTC: PHILIPPINES, 150 m Palawan, PORT BARTON 14.-18.Dec 1990 Bolm lgt.; 1 specimen MHUB: Philippinen, Luzon Bicol NP., 200m 28.III.2000, LF leg. Mey & Ebert; 3 specimens BMNH: INDONESIA- SERAM Solea, Malaise Trap on River bank, viii.1987 M.C. Day BMNH{E}2004-198; 1 specimen DTC: IR 21 – W. New Guinea, track Nabire/Ilaga KM 65, Kali Utowa, 250M, 18.-19.vii.1991 Balke & Hendrich leg.; 1 specimen NME: INDONESIA SUMATRA / INDONESIA,Umg. Bukitlawa, LF 08.III.1995 leg.U.Buchsbaum; 1 specimen NME: Indonesia, Irian Jaya, Nabire 100km W Yeretua Wondowoi Mts. VII.1998, leg. M. Balke, 100m üNN; 1 specimen NME, 1 specimen DTC: Sapintus gracilicornis (Pic) det. D.Telnov, 2002 / INDONESIA,Irian Jaya Jayapura district Genyem,50m NN,IV.-V.1999,leg. M.Balke; 3 specimens NME, 1 specimen DTC: INDONESIA Irian Jaya Asori N Somyangga 02°37'S,136°13'E KÜ 07.I.1999 leg.A.Weigel; 1 specimen NME, 1 specimen DTC: INDONESIA Irian Jaya Asori/Wapoga River,N Umg. Somyangga KL 02°37'S,136°13'E UWP 08.I.1999 leg.A.Weigel; 15 specimens BMNH: INDONESIA: Borneo Kalimantan Tengah Busang / Rekut confl. 0°03'S, 113°59'E / August 2001 MV light Brendell / Mendel / Barito Ulu 2001' BMNH(E) 2001-191; 1 specimen NME: INDONESIA Sulawesi bor. 1km S Sawangan, Flußtal b. River Park resort 250-300m 01°22'51"N, 124°56'56"E 01.-03.II.2004 LF leg. A.Skale; 2 specimens MHUB: **Sulawesi** Selatan Malili, Karebbe am Larona, 14.X.2005 leg. W. Mey; 1 specimen MHUB: **Sulawesi** Selatan Leduledu b. Sorowako Koro Kandara, Turm 15.X.2005, LF leg. W. Mey; 3♂ & 5♀ MHUB: **Borneo** Sabah Danum Valley F.C. 15.-17. VIII.2005 Sg. Palum Tambun, light tower, leg. Mey & Ebert; 2 specimens DTC: **INDONESIA**, central Borneo, Prov. Kalimantan Barat, Putussibau N env., 0°53'N, 112°56'E, 02-10.I.2009, secondary rainforest, leg. A. Napolov; 1 specimen SMNS: BORNEO, Sabah, Danum Valley, Rainforest Lodge, 19.-20.X.2009, leg. U. + H.J. BREMER; 1 specimen NME: Indonesia, Irian Jaya, Nabire 100 km W Yeretua, Wondowoi Mts., VII.1998, leg. M. Balke, 100 m üNN.; 1 specimen NME: INDONESIA, Irian Jaya Nabire distr., 150mNN Cemara River VIII.1998, leg. M.Balke / Sammlung NATURKUNDEMUSEUM ERFURT; 1 specimen NME: INDONESIA, Irian Jaya Nabire distr., Wondiwol Mts., Yeretua IX.1998, 100 m NN leg. M.Balke / Sammlung NATURKUNDEMUSEUM ERFURT; 6 specimens NME: INDONESIA, Irian Jaya Jayapura district Genyem, 50m NN, IV.-V.1999, leg. M.Balke; 16 specimens BMNH: INDONESIA: Borneo Kalimantan Tengah Busang / Rekut confl. 0°03'S, 113°59'E / August 2001 MV light Brendell / Mendel / Barito Ulu 2001' BMNH(E) 2001-191.; 1 specimen DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N 127°54'27,18"E, 18-19.IX.2007, white light, leg. D.Telnov & K.Greķe; 3 specimens DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Wairoro vill. ~10 km W, Gunung Benteng mt. ridge, 0°12'20,19"N 127°48'44,87"E, 150-450 m, 18-20. IX.2007, primary rain forest, river valley, UV light, leg. D.Telnov & K.Greķe; 4 specimens NME, 2 specimens DTC: INDONESIA C-Sulawesi 20km NE Palu, 5km W Tawaeli 250m S 0°43'45", E 119°55'95" 02.III.2009 leg. A. Skale LF (019); 3 specimens NME, 1 specimen DTC: INDONESIA C-Sulawesi ca. 20km NE Palu, ca. 3m [sic!] W Tawaeli 170m S 0°43'56", E 119°55'30" 03. III.2009 leg. A. Skale river valley (020); 1 specimen DTC: **INDONESIA** E, Prov. Maluku tengah, Seram N, distr. Seram Utara, Horale (former Saka) vill. env., 02°56'15"S, 129°04'54"E, 06.IV.2009, shrubs, gardens and secondary lowland forest, white light, leg. D.Telnov & K. Greķe; 1 specimen DTC: **INDONESIA** E, Prov. Maluku tengah, Seram N, distr. Seram Utara, Trans-Seram road between Masohi and Sawai, Horale (former Saka) vill. ~7 km SW, river valley, 02°59'15"S, 129°02'37"E, 07. IV.2009, primeval lowland rainforest, on young trees along the river, leg. D.Telnov & K.Greķe; 1 specimen NME: INDONESIA W-PAPUA 130km SE Kaimana, Omba (=Yamor) river 10-20km from coast, S4°05'49"/ E134°54'09", 10-20m, 09.-11.II.2011 leg. A. Skale (008); 1 specimen DTC: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 2-3 km W, 00°25'40"S, 130°47'36"E, ~70 m, 16-17.II.2012, secondary lowland rainforest on limestone, MV light, leg. D.Telnov; 1 specimen DTC: INDONESIA E, Raja Ampat, Waigeo Island, Waisai 3 km W, 00°26'04"S, 130°47'41"E, 40-50 m, 18.II.2012, secondary lowland rainforest on limestone & clearing, MV light, leg. D.Telnov.

This redescription is based on a male specimen from Danum Valley, Sabah, Malaysian Borneo.

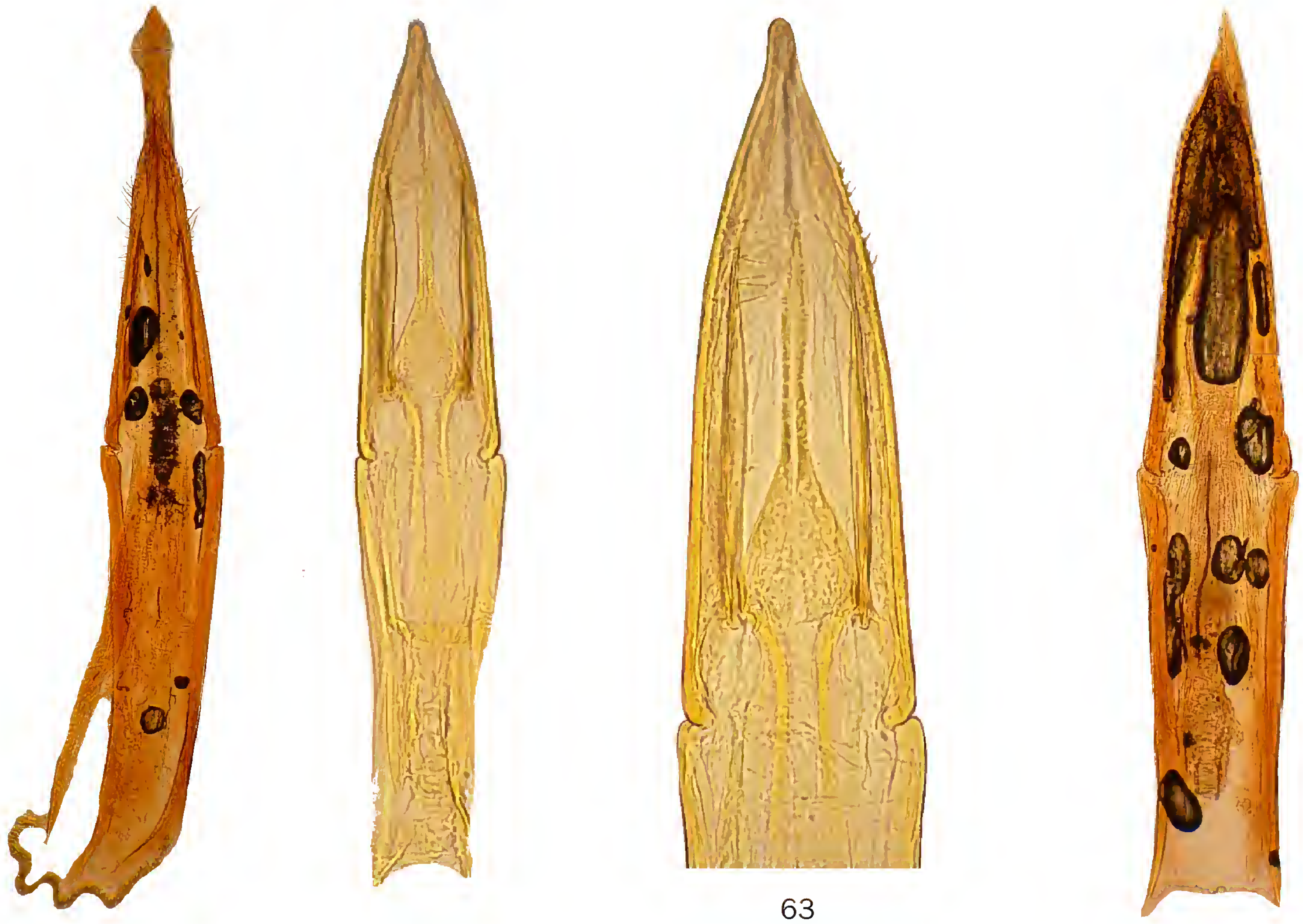
Measurements, ♂: Total body length 4.07 mm, maximum combined width across the middle of elytra 1.20 mm. Head 0.75 mm long, across the eyes 0.80 mm broad, pronotum 0.80 mm long, maximum width 0.65 mm, elytra 2.50 mm long, 1.20 mm broad. Measurements, ♀: Total body length 3.62 mm, maximum combined width across the middle of elytra 1.40 mm. Head 0.70 mm long, across the eyes 0.75 mm broad, pronotum 0.70 mm long, maximum width 0.55 mm, elytra 2.20 mm long, 1.40 mm broad. Measurements, holotype ♀ *Anthicus neoguineensis*: Total body length 3.57 mm, maximum combined width across the middle of elytra 1.13 mm. Head 0.67 mm long, across the eyes 0.72 mm broad, pronotum 0.69 mm long, maximum width 0.62 mm, elytra 2.21 mm long, 1.13 mm broad.

Description: Dorsal surface black, occasionally forebody is reddish-black. Elytra with pale markings, consisting of one postbasal and one preapical yellow-to-orange transverse spot on each elytron. These spots can build transverse bands interrupted or not interrupted on the suture. The shape of the spots often contains irregular (waved/curved) anterior and posterior margins. The posterior spots are usually smaller than the anterior ones. Antennae and palpi yellow, orange or brown with the basal and the terminal antennomeres being paler. Legs with femora usually yellow but tibiae and tarsi darkened. Trochanters, pro- and mesocoxae usually yellow, metacoxae brown to reddish brown. Underside of head and abdomen usually black or dark brown, thorax reddish-black; certain specimens have a uniformly black venter. Head smooth and slightly shiny, with midsized prominent eyes. Tempora about a half of the eye length, with rounded temporal angles. Head base truncate. Punctures large and deep, intervening spaces smooth and of variable size, ranging from smaller than the punctures to twice as large as the punctures. The vertex is more sparsely punctured than the frons. Pubescence yellowish, fine and long, more or less dense. Antennae very long and slender, reaching the middle (and slightly over) of the elytra in the male. Second antennomere in male short, half or less the size of the third antennomere. Antennomeres 3-9 elongate and slender. Penultimate antennomere slightly shorter than preceding ones. Terminal antennomere elongate and slender, about as long as the penultimate one (in some specimens the terminal antennomere is even slightly shorter than the penultimate one). Terminal maxillary palpomere elongate, cultriform. Pronotum smooth and slightly shiny dorsally, rounded anteriorly, significantly narrower than the head, with a feeble lateral postmedian transverse impression. Punctures large, dense and coarse, with intervening spaces much smaller than punctures. Pubescence yellowish, fine, dense and long, with separate long erect tactile setae on the sides and on the disc. Scutellum truncate apically. Elytra elongate, smooth and shiny. Punctures large and dense in the basal half, getting smaller and sparser postmedially. Intervening spaces irregular in size but smaller than punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male is



Figures 51-60. *Sapintus gracilicornis* (Pic, 1895). 51-52: ♂ from Danum Valley, Sabah, Borneo. 51 – Tergite VII; 52 – Sternite VII. 53-54, 59: ♂ from Nabire surroundings, Indonesian New Guinea. 53 – Tergite VII; 54 – Sternite VII; 59 – Spiculum gastrale. 55-56: ♂ from North Sulawesi. 55 – Tergite VII; 56 – Sternite VII. 57-58, 60: ♀ from Central Seram, Central Moluccas. 57 – Tergite VII; 58 – Sternite VII; 60 – Spiculum gastrale.

trapezoid, shallowly excavated on the apical margin and covered with long dense setae (Figs 51, 53, 55). Morphological sternite VII in male is short and broad, broadly rounded on the apical margin and covered with long dense setae (Figs 52, 54, 56). Male aedeagus long, tegmen tapered to apex, setose laterally preapically (Figs 61-65). Morphological tergite VII in female is narrowly rounded on the apical margin and covered with long setae (Fig. 57). Morphological sternite VII in female is short and



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Figures 61-65. *Sapintus gracilicornis* (Pic, 1895). 61: Aedeagus and penis, ♂ from Danum Valley, Sabah, Borneo. 62-63: ♂ from Nabire surroundings, Indonesian New Guinea. 62 – Aedeagus; 63 – Tegmen of aedeagus. 64: Aedeagus, ♂ from North Sulawesi. 65 – Aedeagus and penis, ♂ from Nabire surroundings, Indonesian New Guinea.

65

broad, broadly rounded and very densely setose on the apical margin (Fig. 58).

Sexual dimorphism: Females with comparatively shorter antennae, with second antennomere proportionally longer and without exposed morphological sternite VIII.

Ecology & biology: Sampled both in primary and secondary lowland rainforests, from canopy or partly dry branches/leaves, also attracted to white, MV & UV light. Inhabit lowland rainforests, collected at altitudes of 10-450 m.

Variability: This species is variable in body length and colouration. Certain specimens are completely black-coloured with pale markings on the elytra. Other specimens have a dark reddish forebody. Elytral markings can be yellow or orange with irregularly formed margins and are of various sizes. Both pairs of pale spots can be strongly reduced to narrow (transverse) bands, or anterior pair can be fully absent. The base of the pronotum, or the whole forebody, is rufous in some specimens. The body size varies from 3.25 mm (♀ specimen from Central Halmahera) to 5.30 mm (♂ specimen from the Nabire surroundings, New Guinea).

Distribution: East Malaysia (Sabah), Indonesia (Kalimantan, Sulawesi), the Philippines (Balabac, Luzon, Tawi-Tawi), New Guinea (both Indonesian & Papua New Guinea).

Remarks: Two different type localities are given in the original description of this species, first as ‘Sumbawa’, a few rows behind as ‘Iles Balabac et Banguey’. As there is no indication of Sumbawa on the holotype’s original collecting label, this record should be considered as dubious. No specimens are hitherto known from Banguey Island, so this locality should also be ignored (this is not impossible as a fact, because of the short distance between Banguey and Balabac). In fact, occurrence of this widespread species on both Sumbawa and Banguey is not automatically excluded but just needs further confirmation.

The taxon described as *Anthicus gracilicornis* var. *Semiobliteratus* Pic is only a colour morph with reduced pale markings of the elytra (the anterior pair of pale spots can be completely absent, the posterior pair can be strongly reduced in size).

Sapintus (s. str.) ***hirtipennis*** (Pic, 1900) (Map 3, plate 48 figs 6-7)

Holotype ♀ MSNG: N.Guinea Ighibirei Loria VI.VII.90 [printed, black border] / Typus [printed, text red, red border] / hirtipennis Pic [handwritten, black border] / A. hirtipennis Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Measurements, holotype ♀: Total body length 3.24 mm, maximum combined width across the middle of elytra 1.0 mm. Head 0.70 mm long, across the eyes 0.68 mm broad, pronotum 0.67 mm long, maximum width 0.59 mm, elytra 1.87 mm long, 1.0 mm broad.

Description: Forebody orange, the elytra somewhat paler with darkened humeri, black median transverse band (narrowly interrupted on suture) and dark transverse band in apical third (broadly interrupted on suture). Antennae, palpi and legs yellow. Underside uniformly yellow to orange-yellow. Head smooth and weakly shiny, with midsized prominent eyes. Tempora distinctly shorter than the length of an eye, temporal angles rounded. Head base broadly rounded. Punctures large but flat, not very dense, varying in size. Intervening spaces mostly larger than punctures. The vertex is more sparsely punctured than the frons. Pubescence yellowish, fine and long, not very dense. Antennae short and slender, hardly reaching elytral humeri in the female. Second antennomere in female slightly shorter than the next one. Antennomeres 3-8 elongate and slender. Penultimate antennomere slightly shorter than preceding ones and more distinctly thickened distally. Terminal antennomere conical and elongate, pointed, 1/3 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum smooth dorsally and weakly shiny on antero-lateral angles, densely punctured on disc, rounded anteriorly, significantly narrower than the head. Strongly constricted postmedium laterally toward narrow base. Punctures large and very dense on disc, intervening spaces smaller or much smaller than the punctures. On antero-lateral angles, punctures are much sparser, with intervening spaces shiny and 2-3 times longer than the punctures. On base, punctures are coarse and partly rugulose. Pubescence yellowish, fine, dense and long, appressed and directed posteriorly on disc, with separate long erect tactile setae on the sides and on the disc. Scutellum rounded apically. Elytra elongate and smooth. Humeri strongly rounded. Punctures large but sparse in basal half, getting smaller in the apical third. Intervening spaces irregular in size, ranging from as large to 3 times larger than the punctures. Feeble but distinct postbasal transverse impression present. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Morphological tergite VII in female broadly rounded on apical margin. Morphological sternite VII in female short and broad, broadly rounded and setose on apical margin.

Sexual dimorphism: Male is unknown.

Distribution: This species is only known by the holotype collected at Ighibieri (= Igibira) village in Western Province, Papua New Guinea.

Sapintus (s. str.) ***horvathi*** (Pic, 1902) (Figs 66-70, maps 3-4, plate 51 figs 1-3)

Holotype ♂ HMNH: N. Guinea Biró 1898 [printed] / ♂ [printed] / Stephansort Astrolabe Bai [sic!] [printed] / Holotypus [printed, text red] 1902. Pseudoleptaleus Horvathi Pic [handwritten, red border] / Pseudoleptaleus Horvathi Pic n sp. [handwritten] / Pseudoleptaleus Horvathi Pic [handwritten] det.M. Pic [printed] Typus ! [handwritten, text red].

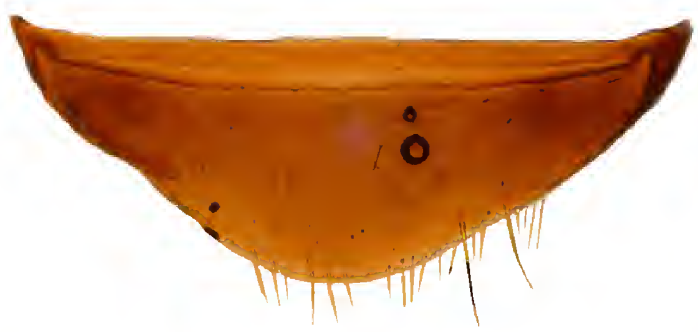
Paratype 1♂ HMNH: N. Guinea Biró 1898 [printed] / Stephansort Astrolabe Bai [sic!] [printed] / Paratypus [printed, text red] 1902 Pseudoleptaleus Horvathi Pic [handwritten, red border] / Pseudoleptaleus Horvathi Pic [handwritten] det.M. Pic [printed] Typus ! [handwritten, text red].

Additional material: 1 specimen DCC: vic Hollandia Dutch N.G. July-Sept 1944 Darlington [printed] / Pseudoleptaleus [printed] horvathi Pic [handwritten] det. G.Uhmann 19[printed] 91 [handwritten]; 2 specimens NME,1 specimen DTC: Indonesia, Irian Jaya, Biak, 10m [sic!] N Bosnik, 136°20'E, 01°05'S UWP, 13.II.1998, leg. A.Weigel; 1 specimen NME: INDONESIA Irian Jaya Japen [sic!], 12km W Serui 03.I.1999 UWS KL leg. A.Weigel; 2 specimens DTC: INDONESIA E, Prov. Maluku tengah, Seram N, distr. Seram Utara, Horale (former Saka) vill. env., 02°56'15"S, 129°04'54"E, 05-06. IV.2009, shrubs, gardens and secondary lowland forest, beaten, leg. D.Telnov & K.Greķe.

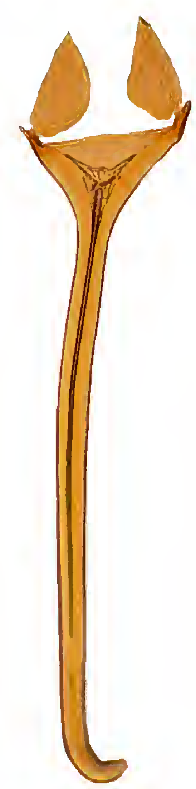
Measurements, holotype ♂: Total body length 2.52 mm, maximum combined width across the middle of elytra 0.78 mm. Head 0.50 mm long, across the eyes 0.55 mm broad, pronotum 0.50 mm long, maximum width 0.40 mm, elytra 1.40 mm long, 0.78 mm broad.

Description: Forebody brown to black or black with base of pronotum brown to reddish. Elytra black or black-brown with pale markings. These markings consist of a yellow or orange postbasal transverse band (can expand anteriad along the suture, covering the scutellum and isolating the dark colouration of the humeri) and an elongate transverse band in the apical third. The preapical band is usually narrower than the postbasal one and can be broadly interrupted on the suture into two elongate transverse spots. The shape of both anterior and posterior spots is often with irregular (waved/curved) anterior and posterior margins. Antennae and palpi usually yellow to orange, basal and intermediary antennomeres can also be more or less strongly darkened. Legs with femora bicolourate – pale in basal and dark in distal half. Tibiae and tarsi, if not pale, then partly or completely darkened. Underside reddish-brown, brown or black, trochanters and coxae yellow if general colouration of a specimen is not black. Head smooth and shiny, with large prominent eyes. Tempora rounded together with base. Punctures large but flat and sparse, intervening spaces larger than punctures. The vertex is more sparsely punctured than the frons. Pubescence whitish to yellowish, fine and long, sparse. Antennae long and slender, reaching postbasal transverse impression of elytra in the male. Second antennomere in male 1/4 shorter than the next one. Antennomeres 3-7 elongate and slender. Antennomeres 8-10 slightly shortened and thickened distally. Terminal antennomere asymmetric,

66



67



68

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70

Figures 66-70. *Sapintus horvathi* (Pic, 1902) ♂ from Northern Seram, Central Moluccas. 66 – Tergite VII; 67 – Sternite VII; 68 – Spiculum gastrale; 69 – Aedeagus; 70 – Tegmen of aedeagus.

conical, pointed, 1/3 longer than the penultimate one. Terminal maxillary palpomere somewhat axe-form. Pronotum smooth and shiny dorsally, very coarse, punctured and wrinkled in basal half of disc. Broadly rounded anteriorly, significantly narrower than head, strongly narrowed postmedium laterally toward narrow base. Anterior half and angles very sparsely punctured. Basal half of disc coarse, wrinkled, intervening spaces much smaller than punctures. Pubescence yellowish, fine, dense and long, appressed and directed posteriorly on disc, with separate long erect tactile setae on the sides and on the disc. Scutellum triangular, pointed apically. Elytra elongate and widened across middle, smooth dorsally. Humeri rounded. Feeble but distinct postbasal transverse impression present. Punctures variable in size, not very dense, getting smaller in apical third. Intervening spaces irregular in size, ranging from smaller than the punctures to 3 times larger than the punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Metatibiae slightly thickened medially in males. Male basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male broadly rounded on apical margin (Fig. 66). Morphological sternite VII in male truncate on apical margin (Fig. 67). Male aedeagus setose laterally preapically, parameres strongly narrowed prior to short pointed apex (Figs 69-70).

Sexual dimorphism: Antennae comparatively shorter in females and female morphological sternite VIII not exposed. Metatibiae without modifications in females.

Variability: This species is variable in body length and colouration. Certain specimens are completely black coloured with pale markings on the elytra. Other specimens have a reddish forebody. Elytral markings can be yellow or orange with irregularly formed margins and of various dimensions.

Distribution: This species is widespread and is known from Yule Island (southern coast of Papuan Peninsula, Papua New Guinea), Cenderawasih Bay (Biak & Yapen islands), Central Moluccas (Seram Island), Morobe Province of Papua New Guinea and also from North Australia (Queensland).

Remarks: Yapen is the correct name for the collecting locality of one of the specimens (not 'Japen' as is erroneously specified on the original collecting label). Specimens from Queensland have not been anatomically studied.

Sapintus (s. str.) ***insulanus*** (Pic, 1900) (Map 3, plate 48 figs 4-5)

Lectotype ♀ MSNG [herewith designated]: N.Guinea Isola Yule [printed] V. [handwritten] 18[printed] 75 [handwritten] L.M.D'Albertis 1876-77 [printed] [black border] / Typus [printed, text red, red border] / insulanus Pic [handwritten, black border] / Anthicus insulanus Pic typus ! [handwritten] / Mus. Civ. Genova [printed].

Paralectotype 1 specimen MNHN [herewith designated]: N.Guinea Isola Yule [printed] V. [handwritten] 18[printed] 75 [handwritten] L.M.D'Albertis 1876-77 [printed] [black border] / TYPE [printed, label red] / insulanus [handwritten].

Measurements, lectotype ♀: Total body length 2.48 mm, maximum combined width across the middle of elytra 0.83 mm. Head 0.58 mm long, across the eyes 0.61 mm broad, pronotum 0.49 mm long, maximum width 0.48 mm, elytra 1.41 mm long, 0.83 mm broad.

Description: Dorsal surface orange, elytra somewhat paler, with a broad dark transverse median band on the elytra immediately behind the middle. This band gets narrower on the sides and is most broad on the suture. Antennae, palpi and legs yellow to yellowish-orange. Underside orange. Head smooth and shiny, with large prominent eyes. Tempora half the size of the eye length, broadly rounded together with base. Punctures large and deep but sparse, intervening spaces ranging from as large to two times larger than the punctures. Frons with distinct broad impunctured median line. Pubescence whitish to yellowish, fine and long, sparse. Antennae slightly thickened distally, reaching humeri of elytra. Second antennomere in female indistinctly shorter than the next one. Antennomeres 7-10 thickened distally. Terminal antennomere asymmetric, blunt, almost two times longer than the penultimate one. Terminal maxillary palpomere small, cultriform. Pronotum smooth and shiny dorsally. Broadly rounded anteriorly, gradually narrowing toward base, significantly narrower than the head, with 3 small blunt lateral denticles in anterior half. Punctures very coarse on disc. On the disc, intervening spaces are mainly smaller than the punctures; punctures on the antero-lateral margins are much smaller and sparser than on the disc. Pubescence yellowish, fine, dense and long, appressed, with separate long erect tactile setae on the sides and on the disc. Scutellum rounded apically. Elytra relatively short, smooth and shiny dorsally. Punctures very large and deep, dense, getting smaller and more flat (but not much sparser) in the apical third. Intervening spaces irregular in size, mainly smaller than or equal to punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward the basal third. Hind wings fully developed. Legs long and slender. Metatibiae slightly thickened medially in males. Female basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in female rounded on apical margin. Morphological sternite VII in female not studied.

Sexual dimorphism: Male is unknown.

Distribution: This species is only known by type series collected on Yule Island near the mainland of Central Province, Papua New Guinea. The records from Australia (Queensland) by Uhmann (2000; 2007) and Dorey (Bird's Head of New Guinea) (Uhmann 2007) both need further confirmation.

Remarks: It is very possible that this species is conspecific with the Australian *S. pollocki* Uhmann, 1999, but as long as no male specimen remains known for *S. insulanus* it will be impossible to confirm this hypothesis.

Sapintus (s. str.) ***insularis*** (Werner, 1965) (Map 1, plate 51 figs 4-5, plate 55 figs 4-5)

= *Sapintus placitus* Bonadona, 1981 [consider new synonymy above]

Paratype ♂ *S. insularis* DCC: KUSAIE, Pakusrik [sic!] I m. II-13-53 V.F.G. Clarke [handwritten] / PARATYPE Anthicus ♂ insularis Werner [handwritten] / PARATYPE [printed, label blue] / Genit Fig. [handwritten] / F. G. Werner collection [printed].

Holotype ♂ *Sapintus placitus* ZMUC: Bismarck Isl. Dyaul Sumuna 4. March 1962 Noona Dan Exp. 61-62 [printed] / Caught by Mercury – light [printed] / HOLOTYPE [printed, label red] / Sapintus placitus n.sp [handwritten] P.Bonadona dét. 19[printed] 78 [handwritten].

Measurements, paratype ♂: Total body length 2.85 mm, maximum combined width across the middle of elytra 1.05 mm. Head 0.55 mm long, across the eyes 0.60 mm broad, pronotum 0.60 mm long, maximum width 0.55 mm, elytra 1.70 mm long, 1.05 mm broad.

Description: Dorsum and venter uniformly black to dark black-brown. Antennae brown, two basal antennomeres paler brown. Legs brown with paler tarsi. All trochanters yellowish brown. Head very densely punctured dorsally, with very large prominent eyes. Tempora much shorter than the eye length. Temporal angles broadly rounded. Base truncate to weakly concave. Punctures very dense but flat and fine, intervening spaces much smaller than punctures. Pubescence yellowish, fine and long, sparse. Antennae elongate and slender, reaching slightly over the elytral humeri. Second antennomere in male half shorter than the next one. Antennomeres 3-6 elongate and slender, slightly thickened distally. Antennomere 4 in male strongly thickened distally. Antennomeres 7-10 shortened and distinctly thickened distally. Terminal antennomere slightly asymmetric, elongate, ovoid, pointed, 1/3 longer than the penultimate one. Terminal maxillary palpomere small, cultriform. Pronotum very densely punctured dorsally. Broadly rounded anteriorly, gradually narrowing toward base, slightly narrower than head. Punctures larger than on head, flat and very dense. Intervening spaces much smaller than punctures. Pubescence yellowish, fine, long and sparse, appressed. Scutellum truncate apically. Elytra elongate, smooth dorsally. Punctures large and deep, dense, getting smaller in apical third. Intervening spaces irregular in size, mainly smaller than or equal to punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae very narrow, developed in apical third only. Hind wings fully developed. Legs long and slender. Male metatarsi as long as metatibiae. Male basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male truncate on apical margin (no figure available). Morphological sternite VII in male truncate apically. Aedeagus with simple, pointed tegmen (see Werner, 1965).

Sexual dimorphism: The female was not available for this study.

Distribution: Caroline Islands, Marshall Islands, Hawaii, Dyaul (also known as Djaul) Island of the Bismarck Archipelago (Papua New Guinea).

Remarks: The correct spelling of the type locality is 'Pukusrik'.

Sapintus (s. str.) ***javanus*** (Marseul, 1882a) (Figs 71-75, map 3, plate 51 figs 6-7)

= *Anthicus javanus* Marseul, 1882b [duplicative description]

= *Anthicus luteonotatus* Pic, 1913

= *Sapintus sodalis* (Pic, 1895) [consider new synonymy above]

Syntype *Sapintus javanus* RMNH: deGavere Batavia Java [handwritten] / javanus 107[a] [handwritten].

Syntype ♂ *Anthicus luteonotatus* SDEI: Anthicus luteonotatus Pic [handwritten] / Taihorin Formosa Sauter, 1911 [printed] VII [handwritten] / Syntypus [printed, label red] / coll. DEI Eberswalde [printed] / Anthicus luteonotatus Pic [handwritten] (see also Telnov 2001a).

Holotype ♀ *Sapintus sodalis* MNHN: Sumatra (Grouvelle) [handwritten] / type [handwritten] / TYPE [printed, label red] / sodalis Pic [handwritten].

Additional material: 4 specimens MHUB: S.O. Borneo, Grabowsky / det. v. Krekich; 1 specimen BMNH: Singapore. Dr. M.Cameron. B.M. 1936-555.; 1 specimen BMNH: Spore / 434 / SINGAPORE: C.J.Saunders. B.M.1933-227.; 1 specimen DTC: R of.S.10.8.22 ....erside [text partly unreadable] / SINGAPORE: C.J.Saunders. B.M.1933-227.; 1 specimen NME: INDONESIA,Irian Jaya Jayapura, Lake Sentani Südufer, 100 m NN VI.1998, leg. M.Balke; 1 specimen DTC: INDONESIA,Irian Jaya Jayapura,Cyclops Mts Sentani,200 m NN VI. 1998,leg. M. Balke; 1 specimen IRSN: Coll. I.R.Sc.N.B. PAPUA NEW GUINEA Canopy Mission Madang Province Baileta, Light Misc 5 8-III-1993 Leg Olivier Missa; 1 specimen SKC: NO Sarawak Niah N.P. 0-100m 14-16.X.2001 leg. S.Kurbatov; 1 specimen DTC: INDONESIA N-Sulawesi 5 km NE Tabulo, Manangga village 50-200m N 0°32'75", E 122°10'10" 28.II.2009 leg. A. Skale (013); 1 specimen NME: INDONESIA N-Sulawesi vic. Raja Basar b. Mouting, 15m N 0°29'78", E 121°12'99" 28.II.2009 leg. A. Skale (016); 1 specimen PAC: #30 of 30.viii.12 Tai O valley Lantau. HK.

This redescription is based on a male specimen from the surrounding of Tabulo, North Sulawesi.

Measurements, ♂: Total body length 2.26 mm, maximum combined width across the middle of elytra 0.73 mm. Head 0.50 mm long, across the eyes 0.50 mm broad, pronotum 0.45 mm long, maximum width 0.46 mm, elytra 1.31 mm long, 0.73 mm broad. Measurements, ♀ from Raja Basar surroundings, North Sulawesi: Total body length 2.37 mm, maximum combined width across the middle of elytra 0.80 mm. Head 0.52 mm long, across the eyes 0.53 mm broad, pronotum 0.45 mm long, maximum width 0.48 mm, elytra 1.40 mm long, 0.80 mm broad.

Description: Forebody black or very dark red, elytra black or black-brown with pale markings. These markings consist of a large postbasal yellow-to-orange spot (narrowly interrupted on the suture or fused together, bearing the lateral margin of the elytra) and a smaller ovoid preapical spot on each elytron. Antennomeres 2-4 pale, basal antennomere and items 5-11, darkened, as is the palpi also. Legs yellow to pale orange, femora darkened in some specimens. Underside brown, pro- and mesothorax reddish, pro- and mesocoxae yellow in some specimens. Head slightly shiny or opaque dorsally, with small but prominent eyes. Tempora as long as or indistinctly longer than the length of an eye, temporal angles rounded. Head base very broadly rounded, subtruncate. Punctures very large, dense and rough, intervening spaces smooth, much smaller than the punctures. Pubescence whitish, fine, sparse. Antennae short and stout, reaching the base of the elytra in the male. Second antennomere in male elongate, slightly shorter than the next one. Antennomeres 3-6 slightly elongate, 7-11 shortened and thickened, building weak club. Penultimate antennomere as long as it is broad, trapezoid. Terminal antennomere strongly asymmetric, blunt, conical, pointed, almost two times longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum slightly shiny or opaque dorsally, broadly rounded anteriorly, narrower than head, strongly narrowed laterally posteriad from antero-lateral angles toward narrow base. Punctures very large, dense and coarse, denser than on the head. Intervening spaces smooth, distinctly smaller than these punctures. Pubescence whitish, fine, quite long, appressed, with separate long erect setae on the sides and the disc. Scutellum triangular, pointed apically. Elytra elongate, smooth and shiny. Punctures large and dense in basal half, getting smaller and sparser in apical third. Intervening spaces irregular in size, mostly smaller, rarely as large as the punctures. Pubescence whitish or yellowish, fine. long and dense, suberect. Undersetae long, directed obliquely laterally. Sutural striae fine and narrow, developed in apical third of elytra. Hind wings fully developed. Legs slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Male protibiae slightly thickened on internal margin. Morphological tergite VII in male broadly trapezoid, truncate or shallowly excavate on apical margin (Fig. 71). Morphological sternite VII in male very short, very broadly rounded on apical margin (Fig. 72). Aedeagus slender, with elongate and pointed tegmen; preapical area of tegmen tridentate on each lateral margin (Figs 74-75). Morphological tergite VII in female broadly rounded on apical margin. Morphological sternite VII in female short, very broadly rounded on apical margin.

Sexual dimorphism: Female with elytra less elongate, more widened postmedium laterally. Protarsi and protibiae less distinctly thickened in the female than in the male.

Ecology & biology: Collected in secondary and primary lowland rainforests and in lowland and lower montane monsoon forests, also attracted to white and mixed light. Hemp (1994) and Hemp & Dettner (2001) listed this species among cantharipiphilous Anthicidae, referring to Young (1984). As was already mentioned above, identifications made


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74


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Figures 71-75. *Sapintus javanus* (Marseul, 1882a) ♂ from Cyclops Mts., Indonesian New Guinea. 71 – Tergite VII; 72 – Sternite VII; 73 – Spiculum gastrale; 74 – Aedeagus; 75 – Tegmen of aedeagus.

by earlier authors were often not based on the study of type specimens and/or their genital organs. Currently I am unable to comment on which species of Anthicini has been attracted to cantharidin in Thailand and was consequently listed by Young (1984) as *Sapintus javanus*. Therefore I cannot currently approve or reject *S. javanus* as belonging to canthariphilous insects.

Distribution: This is a very widely distributed species, known from the Greater Sunda Islands (Java, Sulawesi, Sumatra, the whole of Borneo), SE China (inclusive of Hong Kong), India (except the arid and semiarid areas of the West), Japan, Peninsular Malaysia, Sri Lanka, Taiwan, Thailand, Vietnam, New Guinea (both the Indonesian part and Papua New Guinea).

Remarks: The figure of the aedeagus presented by Krekich-Strassoldo (1930: 259, figure 9P) is incorrect and represents different *Sapintus* species which cannot be properly identified on base of this figure. I cannot agree with the comment by Krekich-Strassoldo (1930: 259) that *S. javanus* (Marseul) and *S. malayensis* (Pic) are conspecific. These two species are clearly different (see the chapter 'Identification key to species of *Sapintus* from the Indo-Australian transition zone' and the individual diagnoses).

Sapintus (s. str.) ***loriae*** (Pic, 1900) (Map 3, plate 52, figs 1-2)

Lectotype ♀ MSNG [herewith designated]: N.Guinea Ighibirei Loria VI.VII.90 [printed, black border] / Typus [printed, text red, red border] / Loriae Pic [handwritten, black border] / A. Loriae Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Paralectotypes 10 specimens [herewith designated]: 6 specimens MSNG: same label as in lectotype; 1 specimen MSNG: N.Guinea Ighibirei Loria VI.VII.90 [printed, black border] / Anthicus Loriae Pic Cotyp. [handwritten] / Mus. Civ. Genova [printed]; 1 specimen MNHN: N.Guinea Ighibirei Loria VI.VII.90 [printed, black border] / type [handwritten] / TYPE [printed, label red] / A Loriae Pic [handwritten]; 2 specimens MNHN: N.Guinea Ighibirei Loria VI.VII.90 [printed, black border] / type [handwritten].

Measurements, lectotype ♀: Total body length 3.15 mm, maximum combined width across the middle of elytra 1.15 mm. Head 0.66 mm long, across the eyes 0.65 mm broad, pronotum 0.59 mm long, maximum width 0.52 mm, elytra 1.90 mm long, 1.15 mm broad.

Description: Forebody and scutellum red, elytra black-brown with preapical area indistinctly paler. Antennae pale on base, darkened at antennomeres 4-11. Palpi and legs orange. Underside brown, prothorax red. Head densely punctured dorsally, with large prominent eyes. Tempora distinctly shorter than the length of an eye, temporal angles rounded. Head base very broadly rounded, subtruncate. Punctures large and flat, sparse. Intervening spaces larger than these punctures, but finely microstriate and covered by very dense minute punctures. Pubescence yellowish, fine, long and dense. Antennae slender, reaching slightly over the elytral humeri in the female. Second antennomere in female slightly shorter than the next one. Antennomeres 3-9 elongate and slender. Penultimate antennomere slightly shortened and indistinctly thickened distally. Terminal antennomere asymmetric, elongate, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum densely punctured dorsally except for smooth antero-lateral margins, rounded anteriorly, significantly narrower than the head. Strongly narrowed postmedium laterally toward narrow base. Punctures of two sizes: basic punctures very small, dense on the basal half of the disc but much sparser on the anterior half and on the sides. Intervening spaces smaller than these punctures. Larger punctures are much sparser, their intervening spaces are between as large to two times larger than the punctures. Pubescence yellowish, fine, long and dense, With separate long erect setae on the sides and the disc. Scutellum triangular, pointed apically. Elytra elongate and smooth. Punctures large and dense in the basal half, getting smaller but not much sparser in the apical third. Intervening spaces irregular in size, mostly smaller, rarely as large as the punctures. Pubescence yellowish, long and dense, appressed. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward the basal third of the elytra. Hind wings fully developed. Legs long and slender. Morphological tergite VII in female broadly rounded on apical margin. Morphological sternite VII in female short and broad, broadly rounded on apical margin.

Sexual dimorphism: The male was not available for this study.

Distribution: This species is only known by the type series collected at Ighibieri (= Igibira) village in Western Province, Papua New Guinea.

Sapintus (s. str.) ***macrops* sp. nov.** (Fig. 76, map 3, plate 52 figs 3-4)

Holotype ♂ NME: INDONESIA, Irian Jaya Nabire distr., 150 m NN Cemara River VIII.1998, leg. M.Balke [printed].

Paratypes 2♀ MHUB: IR 21 - W.New Guinea, track Nabire-Ilaga KM 65, Kali Utowa, 250M, 18.-19.vii.1991 Balke & Hendrich leg. [printed] / Sapintus [printed] rugosicollis Pic [handwritten] det. G. Uhmann 19 [printed] 92 [handwritten].

Derivatio nominis: Named from the Greek 'macro' [large] + 'ops' [eye], because of the very large eyes of this species.

Measurements, holotype ♂: Total body length 2.67 mm, maximum combined width across postmedium of elytra 0.85 mm. Head 0.57 mm long, across the eyes 0.52 mm broad, pronotum 0.50 mm long, maximum width 0.47 mm, elytra 1.60 mm long, 0.85 mm broad. Measurements, ♀: Total body length 2.55 mm, maximum combined width across apical third of elytra 0.81 mm. Head 0.55 mm long, across the eyes 0.54 mm broad, pronotum 0.45 mm long, maximum width 0.41 mm, elytra 1.50 mm long, 0.81 mm broad.

Description: Forebody reddish-orange, elytra black. Antennae brown with basal antennomere red-to-orange and antennomeres 2-3 slightly paler than items 4-11. Palpi and legs orange (meso- and metafemora brown in the holotype), terminal maxillary palpomere darkened. Pro- and mesothorax reddish brown. All coxae and trochanters reddish brown, abdomen brown to black-brown. Head opaque dorsally, with very large and strongly prominent eyes covering almost the whole sides of the head. Tempora very short, temporal angles rounded. Head base truncate or subtruncate (very broadly rounded). Punctures very dense but fine and flat, intervening spaces smaller than punctures on the frons. Pubescence yellowish, fine, long and dense. Antennae slender, in both sexes reaching slightly over the elytral humeri. Second antennomere in

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Figure 76. *Sapintus macrops* sp. nov., holotype ♂ – Tergite VII.

male 1/4 shorter than the next one. Antennomeres 3-7 elongate and slender, 7th antennomere thickened distally. Antennomeres 8-10 in male stouter, distinctly thickened distally. Terminal antennomere asymmetric, blunt, conical, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum opaque dorsally, densely minutely punctured, rounded anteriorly, narrower than head. Narrowed postmedium laterally toward base, intervening spaces much smaller than the punctures on the disc and in the pre-basal area. Antero-lateral angles less densely punctured, but also opaque. Pubescence yellowish, fine, long and dense, appressed, with separate long erect setae on the sides and the disc. Scutellum triangular, pointed apically. Elytra elongate, densely, coarsely punctured, opaque or slightly shiny dorsally. Punctures large and dense, almost not getting smaller toward apices. Intervening spaces smaller than punctures. Pubescence yellowish, long and dense, appressed. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward the basal third of the elytra. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male trapezoid, rounded on apical margin (Fig. 76). Morphological sternite VII in male short and broad, very broadly rounded on apical margin. Tegmen of aedeagus tapered apically. Morphological tergite VII in female broadly rounded on apical margin. Morphological sternite VII in female broad, very broadly rounded on apical margin.

Sexual dimorphism: Almost not indicated. Antennomeres 9-10 are comparatively broader in the male than in the female. The eyes are comparatively larger in the male.

Ecology & biology: Collected in primary lowland rainforest at an altitude of 250 m.

Differential diagnosis: This species morphologically resembles *S. rugosicollis* (Pic, 1900) (Papua New Guinea: Trans-Fly lowlands) [I was unable to study the male genital organs of this species]. The eyes are smaller in *S. rugosicollis*, the tempora are about 1/3 shorter than the eye length. The pubescence on the head and pronotum is less dense and shorter, partly scale-like (especially near the base of the pronotum) in *S. rugosicollis*. The pronotum is coarsely punctured compared to the head in *S. rugosicollis* (about the same denseness and coarseness as in the *S. macrops*), with partly rugulose intervening spaces on the pronotum (not rugulose in *S. macrops*).

Distribution: The species is known from the surrounding regions of Nabire, in the northern Bird's Neck isthmus of New Guinea.

Sapintus (s. str.) ***madangensis*** Uhmann, 1995
(Figs 77-80, map 3, plate 52 figs 5-6)

Holotype ♂ NMNZ: GOGOL RIVER MADANG North East New Guinea R.W.HORNABROOK [printed] Sept 1969 [handwritten] / *Sapintus madangensis* sp. n. det. G. Uhmann 1995 [printed] / HOLOTYPE [printed, label red] / Museum of New Zealand Te Papa Tongarewa, PO Box 467, Wellington, N.Z. [printed].

Measurements, holotype ♂: Total body length 3.09 mm, maximum combined width across the middle of elytra 0.88 mm. Head 0.69 mm long, across the eyes 0.61 mm broad, pronotum 0.60 mm long, maximum width 0.61 mm, elytra 1.80 mm long, 0.88 mm broad.

Description: Dorsum dark red to red-brown, elytra with irregular pale yellow markings consisting of a broad postbasal transverse band, prolongated along the suture to the scutellum and toward the middle, where it meets with a median transverse oval spot enclosed laterally and posteriorly by a dark red pattern; in the apical third with another broad transverse band, very narrowly interrupted on the suture. Antennae, palpi and legs yellow, the latest with slightly darker femora. Underside uniformly pale orange. Head smooth dorsally, in part densely punctured, with large prominent eyes. Tempora broadly rounded, together with a head base which is indistinctly angulate medially. Punctures large and coarse on the frons and the near eyes, the intervening spaces much smaller than these punctures. Head dorsum posterior to eyes and on vertex extremely finely and sparsely punctured. Pubescence yellowish, fine, long and dense. Antennae slender, reaching slightly over the elytral humeri in the male. Second antennomere in male not or indistinctly shorter than the next one. Antennomeres 3-6 elongate and slender, 7-8 thickened distally, 8-9 shortened. Terminal antennomere asymmetric, elongate, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum very densely punctured on the disc except for smooth antero-lateral angles, rounded anteriorly, about of the same width as the head. Strongly narrowed postmedium laterally toward narrow base. Punctures very dense and coarse on the disc, with intervening spaces irregular and much smaller than punctures. Antero-lateral margins finely and sparsely punctured, smooth. Pubescence yellowish, fine, long and dense, appressed, with separate long erect setae on the sides and the disc. Scutellum triangular, rounded apically. Elytra elongate and smooth. Punctures large and coarse but sparse. Intervening spaces irregular in size, ranging from as large to twice as large as the punctures. Pubescence yellowish, long and quite sparse, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Male pro- and metatibiae slightly thickened medially. Male basal tarsomere of the metathoracic legs longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male broadly rounded on apical margin. Morphological sternite VII in male excavated on apical margin (Fig. 77). Aedeagus with tegmen tripartite apically (Figs 79-80).

Sexual dimorphism: Female is unknown.

Distribution: This species is only known by the holotype collected near Madang in Papua New Guinea.

Sapintus (s. str.) ***malayensis*** (Pic, 1895) (Figs 81-85, map 5, plate 53 figs 1-2)

Holotype ♀ MNHN: ○ [small circular blue label without text] / type [handwritten] / TYPE [printed, label red] /

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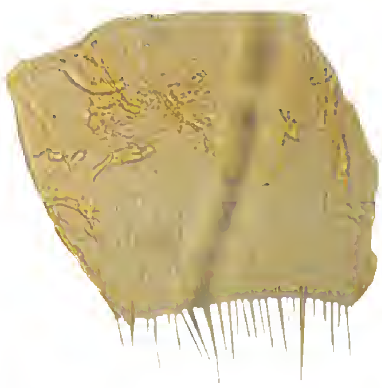
Figures 77-80. *Sapintus madangensis* Uhmann, 1995, holotype ♂. 77 – Sternite VII; 78 – Spiculum gastrale; 79 – Aedeagus; 80 – Tegmen of aedeagus.

malayensis Pic [handwritten] / pres bizonellus ... [handwritten, partly unreadable].
Additional material: 1♀ MHUB: Sumbawa Besàr 24.4.-2.5.27 B.Rensch S.G. / Anthicus malayensis Pic det. Dr. R. F. Heberdey; 1♀ BMNH: Under bark of fallen tree / SULAWESI TENGAH: Nr. Morowali, Ranu River Area. 27.i.-20.iv.1980 / M.J.D.Brendell B.M.1980-280; 1♂ BMNH: At light / SULAWESI TENGAH: Nr. Kolonodale, Gililana village 1°55'S-121°22'E. 7-8.ii.1980 / M.J.D.Brendell B.M.1980-280.

This redescription is based on a female specimen from Sumbawa Besàr and a male specimen from Kolonodale surroundings, Central Sulawesi.
Measurements, ♂: Total body length 2.66 mm, maximum combined width postmedium of elytra 0.78 mm. Head 0.51 mm long, across the eyes 0.57 mm broad, pronotum 0.52 mm long, maximum width 0.45 mm, elytra 1.63 mm long, 0.78 mm broad. Measurements, ♀: Total body length 3.07 mm, maximum combined width postmedium of elytra 0.97 mm. Head 0.67 mm long, across the eyes 0.65 mm broad, pronotum 0.60 mm long, maximum width 0.55 mm, elytra 1.80 mm long, 0.97 mm broad.
Description: Head and elytra pale orange, pronotum dark orange. Elytra pale with black humeri, broad median black transverse band interrupted on the suture and the brown apices (dark colouration prolonged antero-medially along the suture). Antennae, palpi and legs yellow. Underside uniformly orange or dark orange. Head smooth dorsally, with large prominent eyes. Tempora about 1/3 shorter than the eye length, with rounded temporal angles. Base truncate to subtruncate. Punctures large and dense on the frons and near the eyes, intervening spaces mostly much smaller than these punctures. Head dorsum posterior to eyes and on vertex more



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Figures 81-85. *Sapintus malayensis* (Pic, 1895), ♂ from Ranu River area, Central Sulawesi. 81 – Tergite VII; 82 – Sternite VII; 83 – Spiculum gastrale; 84 – Aedeagus; 85 – Tegmen of aedeagus.

sparsely punctured. Pubescence yellowish, fine, long and dense. Antennae slender, in male reaching the postbasal transverse impression area, in the female reaching slightly over the elytral humeri. Second antennomere in the male 1/3 shorter than the next one, in the female 1/4 shorter than the next one. Antennomeres 3-8 elongate and slender, 9-10 somewhat thickened. Terminal antennomere in both sexes elongate, conical, pointed, 1/3 to 1/4 longer than the penultimate one. Terminal maxillary palpomere cultriform. Pronotum very densely and coarsely punctured, rounded anteriorly, narrower than the head. Strongly constricted postmedium laterally toward base. Punctures very dense and coarse on disc, with intervening spaces irregular and much smaller than punctures. Pubescence yellowish, fine, long and dense, appressed, with separate very long erect setae on the sides and the disc. Scutellum truncate apically. Elytra elongate and weakly smooth. Punctures large and coarse in basal half, intervening spaces irregular in size, ranging from smaller than to as large as punctures. In the apical half the punctures get smaller and more flat, but not much sparser. Pubescence yellowish, long and quite sparse, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. The male basal tarsomere of the metathoracic legs is as long as or slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male truncate or very feebly excavated on apical margin (Fig. 81). Morphological sternite VII in male short and broad, broadly rounded on apical margin (Fig. 82). Aedeagus with narrow, prolongate but rounded apex (Figs 84-85). Morphological tergite VII in female broadly rounded on apical margin. The morphological sternite VII in the female was not studied.

Sexual dimorphism: Almost not indicated. Male body more slender than the female. Antennae longer on the male than on the female.

Variability: The forebody of the holotype is uniformly dark red. A dark median transverse band is not interrupted on the suture in the holotype. Specimens from Central Sulawesi are generally more coarsely punctate on the head.

Ecology & biology: Görnitz (1937), Hemp (1994) and Hemp & Dettner (2001) listed this species among canthariphilous Anthicidae. As was already mentioned above, identifications made by earlier authors, for example, those by R.F. Heberdey (mentioned Görnitz 1937), were often not based on studies of type specimens and/or their genital organs. Currently I am unable to comment on which species of Anthicini have been attracted to cantharidin near Bangkok, Thailand and was consequently listed by Görnitz (1937) as *Anthicus malayensis*. Therefore I cannot currently approve or reject *Sapintus malayensis* as belonging to canthariphilous insects.

Distribution: This species originates from Sumbawa and Central Sulawesi (Wallacea), and is also mentioned as being from Peninsular Malaysia (Uhmann 1995b; 2000), Southern Vietnam and Java (Telnov 2001a). Records from Vietnam and Java are based on misidentified specimens and are to be ignored (but occurrence of this species in Java is considered possible). No specimens from Peninsular Malaysia were available for this study, but these records are considered doubtful because most of Uhmann's identifications are not based on study type material and male genital organs.

Sapintus (s. str.) ***malut*** **sp. nov.** (Figs 86-94, map 4, plate 53 figs 3-4)

Holotype ♂ NME: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. S env., Tilope vill. 10 km SW, way to Oham (along Gunung Talaga mt.), 0°13'15,10"N 127°53'28,25"E, 14.IX.2007, edge of secondary lowland forest, beaten from freshly cut branches, D.Telnov & K.Greķe.

Paratypes 36 specimens. 1 DTC: same labels as in holotype; 1 NME: IDO: N-Molukken Ternate,Laguna lake 45'44"N,127°21'6"E 29.I.2006 lake side leg. A.Weigel KL; 3 NME, 1 DTC: INDONESIA N-Molukken Ternate Laguna lake, 0°45'44"N, 127°21'6"E 11.I.2006 leg. A.Skale lake side (+ 29.I.2006); 4 NME, 1 DTC: IDO: N-Molukken Hiri Island,3km N of Ternate 100-400m, 0°53'6"N, 127°20'E 22.I.2006 leg.A.Weigel plantage; 2♀ NME, 2♀ DTC: INDONESIA N-Molukken Hiri Island 3km N Ternate 100-400m, 0°53'6"N, 127°20'E 22.I.2006 leg. A.Skale; Indonesia Halmahera NW 21km N Jailolo, Goal village, 100m, 1°14'11"N, 127°32'10"E 23.I.2006 leg. A. Skale plantage + riverside; 1 NME: IDO: Halmahera NW 7km S Jailolo, 200m 1°1'18"N, 127°31'39"E 27.I.2006 leg.A.Weigel; 1 NME: INDONESIA Halmahera S 2-3km N Dolik,Dolik river 0°15'49"N [sic!], 127°42'40"E 18.I.2006 leg. A.Weigel plantage + UWS; 1 NME: INDONESIA S-Halmahera ca. 6km S Dolik, 18'29"N [sic!] 127°44'45"E 19.I.2006 leg. A. Weigel plantage; 2 NME, 1 DTC: INDONESIA N-Molukken Bacan, Labuha, Flußtal 3km S, 12.I.2006, leg. A.Skale plantage + UWS; 1 NME: INDONESIA N-Molukken N-Bacan, Gorogoro 23'27"N [sic!], 127°36'33"E 16.I.2006 leg.A.Weigel; 2 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N

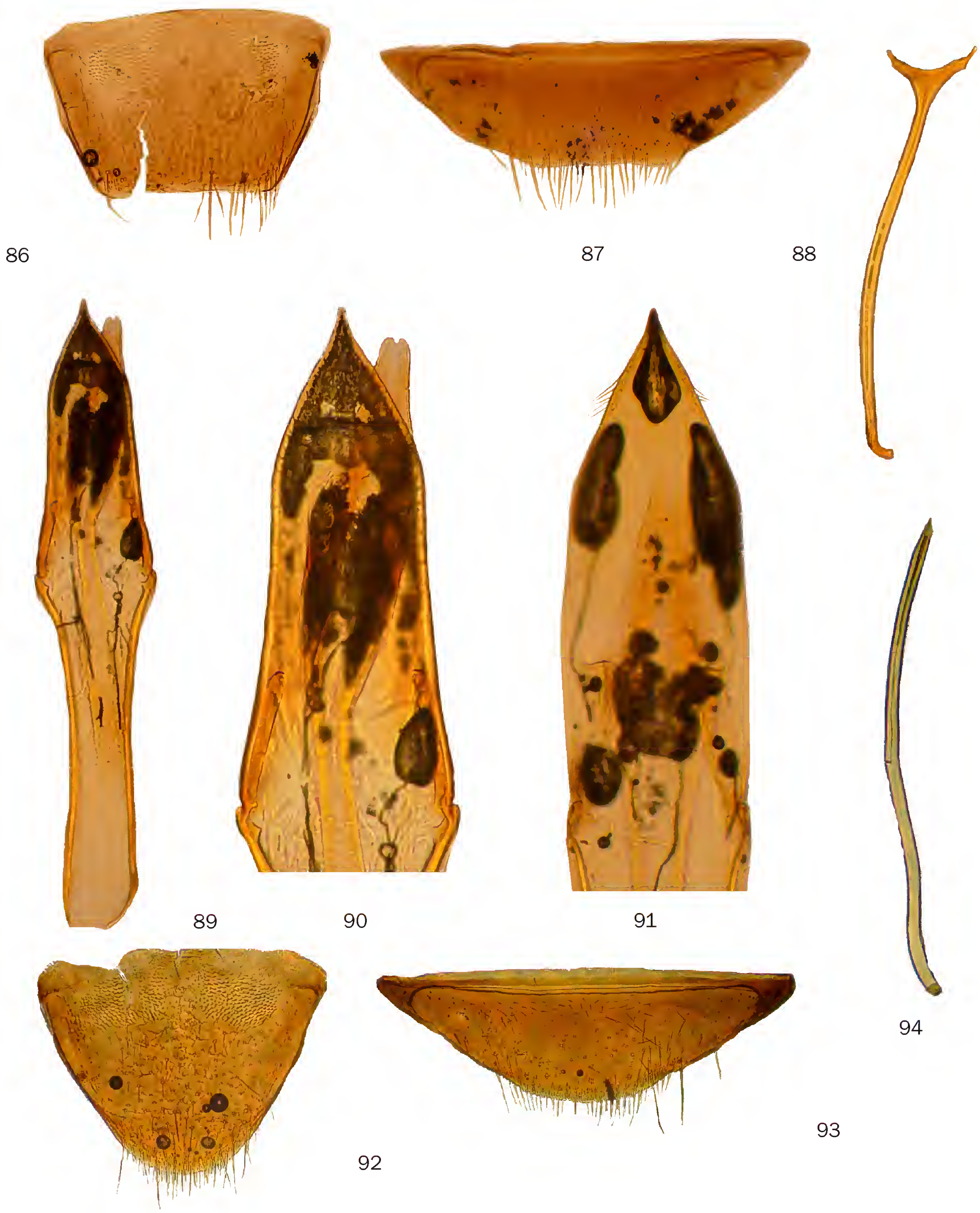
127°54'27,18"E, 09.IX.2007, plantations, beaten, leg. D.Telnov & K.Greķe; 1 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N 127°54'27,18"E, 09.IX.2007, plantations, beaten from freshly cut partly dry branches, leg. D.Telnov & K.Greķe; 2 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. S env., Tilope vill. 10-15 km SW, between Gunung Talaga mt. and Oham, 12.IX.2007, secondary lowland forest, beaten from freshly cut branches, leg. D.Telnov & K.Greķe; 1 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N 127°54'27,18"E, 12.IX.2007, plantations, UV light, leg. D.Telnov & K.Greķe; 5 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera tengah (Central), Weda Selatan dist., Loleo vill. SW env., Tilope vill. env., 0°13'58,16"N 127°54'27,18"E, 12.IX.2007 beaten from dry leafs, roadside, between plantations, leg. D.Telnov & K.Greķe; 2 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Loleo vill. S env., Tilope vill. 10-15 km SW, way from Gunung Talaga mt. to Oham, 14.IX.2007, primary lowland forest, beaten from branches, leg. D.Telnov & K.Greķe; 1 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Wairoro vill. ~10 km W, Gunung Benteng mt. ridge, 0°12'20,19"N 127°48'44,87"E, 150-450 m, 18-20.IX.2007, primary rain forest, river valley, beaten, leg. D.Telnov & K.Greķe; 1 DTC: INDONESIA, prov. Maluku Utara (North Moluccas), Halmahera, Halmahera tengah (Central), Weda Selatan dist., Wairoro vill. ~10 km W, Gunung Benteng mt. ridge, 0°12'20,19"N 127°48'44,87"E, 150-450 m, 19.IX.2007, primary rain forest, small clearing, beaten, leg. D.Telnov & K.Greķe.

Derivatio nominis: Named after its area of origin, North Moluccas or Maluku Utara in Bahasa Indonesia.

Measurements, holotype ♂: Total body length 2.75 mm, maximum combined width across the middle of elytra 0.90 mm. Head 0.60 mm long, across the eyes 0.51 mm broad, pronotum 0.55 mm long, maximum width 0.43 mm, elytra 1.60 mm long, 0.90 mm broad. Measurements, paratype ♀ from Central Halmahera, Tilope surroundings: Total body length 3.17 mm, maximum combined width across the middle of elytra 0.85 mm. Head 0.72 mm long, across the eyes 0.60 mm broad, pronotum 0.60 mm long, maximum width 0.51 mm, elytra 1.90 mm long, 0.85 mm broad.

Description: Forebody black (reddish-black in some paratypic specimens), head somewhat paler at base, mouth parts orange. Elytra black with pale markings, consisting of orange postbasal and preapical transverse bands. The anterior band is complete or narrowly interrupted on the suture, bearing or not bearing the lateral margins of the elytra; in most specimens the anterior pale colouration is prolongated along the suture and bearing the base of the elytra. The posterior band is broadly interrupted along the suture, not bearing the lateral margin of the elytra. Basal antennomeres 2-4 orange, remaining antennomeres darkened. Legs black to brown, tibiae and tarsi somewhat paler. Underside brown to black-brown, trochanters and coxae paler coloured in some paratypic specimens. Head opaque, with mid-sized and prominent eyes. Tempora broadly rounded together with base. Punctures flat, large, very dense and coarse, intervening spaces microreticulate, smaller than the punctures. Pubescence yellowish, fine and long, dense. Antennae slender, in both sexes reaching the postbasal transverse impression of the elytra. Second antennomere in male 1/4 shorter than the next one. Antennomeres 3-7 elongate and slender. Antennomeres 8-10 slightly shortened, of them 9-10 thickened distally. Terminal antennomere asymmetric, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum opaque dorsally, broadly rounded anteriorly, significantly narrower than the head, strongly constricted postmedium laterally toward narrow base. Very densely and coarsely punctured on the disc, intervening spaces much smaller than the punctures. Antero-lateral angles also opaque but less coarsely punctured. Pubescence yellowish, fine, long and dense, appressed, with several long erect tactile setae on the sides and on the disc. Scutellum narrowly triangular, pointed apically. Elytra elongate and slightly widened across the middle, smooth dorsally. Humeri rounded. Postbasal transverse impression feeble. Punctures large, getting much more flat in the apical third. Intervening spaces ranging from as large to twice as large as the punctures. Pubescence yellowish, long and dense, suberect, with numerous very long erect to suberect tactile setae present on the disc. Undersetae directed obliquely laterally. Sutural striae broad, completely developed. Hind wings fully developed. Legs long and slender. Both male and female metatibiae slightly thickened, but stronger in the female than in the male. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres.

Male basal tarsomere of the metathoracic legs distinctly thickened. Morphological tergite VII in male trapezoid, truncate on apical margin (Fig. 86). Morphological sternite VII in male very short, broadly rounded on apical margin (Fig. 87). Male aedeagus with pointed tegmen (Figs 89-91). Morphological tergite VII in female narrowly rounded and densely setose on the apical margin (Fig. 92). Morphological sternite VII in female broadly rounded on apical margin (Fig. 93).



Figures 86-94. *Sapintus malut* sp. nov. 86-91: ♂ paratypes from Tilope surroundings, Central Halmahera, North Moluccas. 86 – Tergite VII; 87 – Sternite VII; 88 – Spiculum gastrale; 89 – Aedeagus; 90 & 91 – Tegmen of aedeagus. 92-94: ♀ paratype from Tilope surroundings, Central Halmahera, North Moluccas. 92 – Tergite VII; 93 – Sternite VII; 94 – Spiculum gastrale.

Sexual dimorphism: Metatibiae more strongly thickened in the female than in the male.
Variability: The size and shape of the pale elytral markings vary. Specimens vary in body length from 2.50 to 3.17 mm.
Ecology & biology: Specimens were collected during the hot and sunny daytime in both primary and strongly disturbed lowland rainforest, and also in gardens or small plantations. Specimens were beaten from dry or partly dry leaves of fresh or dry thin branches. One paratypic specimen was also attracted to UV light.
Differential diagnosis: Very close to *S. celeripes* sp. nov. (described above; Bird's Neck isthmus of New Guinea and Salawati Island of the Raja Ampat Islands), *S. geminus* sp. nov. (described above; Papua New Guinea: Madang Province), *S. horvathi* (Pic, 1902) (New Guinea & Central Moluccas), and *S. sexualis* sp. nov. (described below; Raja Ampat Islands). The tegmen of the aedeagus is narrowly pointed in new species and not spatulate like in *S. geminus,* or broadly and shortly pointed like in *S. horvathi*. The male morphological tergite VII is truncate apically (excavated in *S. sexualis*). The male morphological sternite VII is broadly rounded apically (feebly excavated in *S. sexualis*). The tegmen of the aedeagus is not pubescent preapically in *S. malut* sp. nov. (covered with a long pubescence in *S. celeripes*).
Distribution: This species is known from Northern Moluccas and hitherto registered from the islands of Halmahera, Ternate, Hiri and Bacan.
Remarks: An incorrect longitude is indicated on the original labels of some specimens from Bacan Island and the southern peninsula of Halmahera. N [North] is to be replaced with S [South], because the site is located in the Southern Hemisphere.

Sapintus (s. str.) ***monstrosiantennatus* sp. nov.**
(Figs 95-98, map 5, plate 53 figs 5-6)
Holotype ♂ NME: 2c 030505 F [printed] ANTH 3 [handwritten] / Indonesia \ C.Sulawesi Kab. Dongala, Toro 1°30'S, 120°02'E alt. 750-1000 m fogging, leg. M.Bos [printed] / cacao plantation, planted Fabac shade, off T. cacao (sample code and date) F [printed] 03. V. [handwritten] 200[printed] 5[handwritten].

Derivatio nominis: Named from the Latin 'monstrum' [monster, miracle] + 'antenna' [antenna], because of the strongly modified male antennae.
Measurements, holotype ♂: Total body length 2.27 mm, maximum combined width across the middle of elytra 0.90 mm. Head 0.49 mm long, across the eyes 0.50 mm broad, pronotum 0.45 mm long, maximum width 0.41 mm, elytra 1.33 mm long, 0.90 mm broad.
Description: Head dark orange-brown, pronotum and elytra orange, the latest with narrowly black shoulders, a narrow and irregular black transverse midband and a broad brown preapical transverse band; both median and preapical bands not bearing the lateral margin of the elytra. Antennae, palpi and legs yellow. Underside in part orange, in part yellowish-brown. Head smooth and shiny dorsally, with large prominent eyes. Tempora almost straight, 1/3 shorter than the eye length, rounded on temporal angles. Base truncate. Punctures on the frons very large and dense, intervening spaces smaller than the punctures. The vertex is much more sparsely punctured. Pubescence yellowish, fine, long and sparse. Antennae heavy, reaching the elytral humeri in the male. Second antennomere in the male as long as the next one. Antennomeres 4-6 in male strongly shortened, 6th antennomere slightly transverse. Antennomeres 7-10 strongly enlarged and thickened, with 7th antennomere the longest and 10th the shortest among the four. Terminal antennomere asymmetric, blunt, conical, more than two times longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum trapezoid, dorsally smooth, broadly rounded anteriorly, significantly narrower than the head. Slightly narrowed postmedium laterally toward base. Punctures very large, dense and coarse, intervening spaces much smaller than the punctures. Pubescence yellowish, very long but quite sparse, appressed, with a few long erect setae on the sides and the disc. Scutellum broadly rounded apically. Elytra elongate, ovoid, smooth and shiny dorsally. Punctures very large, dense and coarse in the basal half, intervening spaces smaller than the punctures. In the apical third punctures get less coarse but not sparser. Pubescence yellowish, very long and dense, suberect. Undersetae sparse, directed obliquely laterally. Sutural striae narrow, developed in apical third only. Hind wings fully developed. Legs long and slender. Male protarsi very slightly thickened. Male mesotarsi as long as mesotibiae. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male short, truncate and finely densely setose on apical margin (Fig. 95). Morphological sternite VII in male short, very broadly rounded on apical margin (Fig. 96). Aedeagus of male almost parallel, tegmen slightly widened apically and with short thin and pointed apex (Figs 97-98).
Sexual dimorphism: Female is unknown.

Ecology & biology: Collected on a plantation by fogging a cocoa tree (*Theobroma cacao*) at the elevation between 750-1000 m.

Differential diagnosis: Due to modifications of the male antennae, the general appearance looks very similar to *S. insignatipennis* (Pic, 1943) (South India), *S. plectilis* (Pic, 1910) (Southern and Eastern China, India (except the West), Indonesia (Sulawesi), Taiwan, Thailand, Vietnam) and *S. pollocki* Uhmann, 1999 (Australia: Queensland). None of the three mentioned species have dark elytral markings like new species have. The tegmen of the aedeagus in *S. pollocki* is spatulate preapically and with a long thin apex; the tempora are somewhat longer and more rounded, the head base less strongly truncate. In *S. pollocki* the head base is more rounded, the sides of the pronotum stronger converging posteriad, the elytral punctures are comparatively less coarse. In *S. insignatipennis* the head is much finely and sparsely punctate, the penultimate antennomere very long and not shortened.

Distribution: This species is known from Central Sulawesi.

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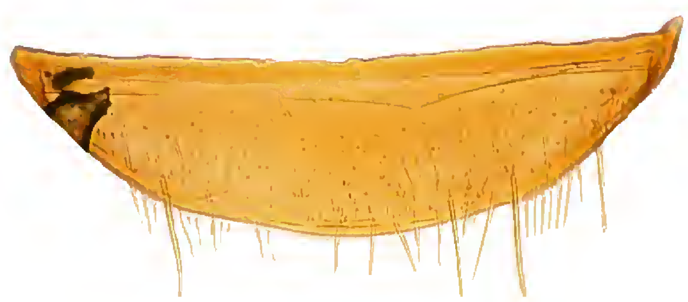

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97 98

Figures 95-98. *Sapintus monstrosiantennatus* sp. nov., holotype ♂. 95 – Tergite VII; 96 – Sternite VII; 97 – Aedeagus; 98 – Tegmen of aedeagus.

Sapintus (s. str.) ***oceanicus*** (LaFerté-Sénectère, 1849a) (Figs 99-107, plate 54 figs 2-6)

= *Anthicus oceanicus* LaFerté-Sénectère, 1849b [duplicative description]

= *Anthicus oceanicus* var. *Françoisi* Pic, 1902 [consider new synonymy above]

= *Anthicus oceanicus* var. *guamensis* Blair, 1942

Type material: Not studied for nominate form.

Syntype ♂ *Anthicus oceanicus* var. *guamensis* BMNH: Type [printed, label circular, border red] / R.L.Usinger Collector [printed] / Yona, Guam [printed] 5-12-36 [handwritten] / ex pigeon pea [handwritten] / Pres.by Imp.Inst.Ent. B.M.1940- [printed] 52 [handwritten] / Anthicus oceanicus Laf. v. guamensis Blr. [handwritten] det.K.G.Blair. [printed] Type [handwritten].

Additional material: 18 specimens [15 BMNH, 3 DTC]: FIJI IS. Taveuni. Waiyevo. [printed] 5.VI.24. At light. 1498-24. [handwritten] Dr.H.S.Evans. [printed] / Pres.by Imp.Inst.Ent. B.M.1932- [printed] 412. [handwritten] / A. oceanicus var. Francoisi Pic [handwritten] Dr. R. F. Heberdey [printed]; New Hebrides: Malekula, Ounua, Feb.1929. Miss L.E.Cheesman. B.M.1929-280.; 1 specimen BMNH: New Hebrides: Malekula, Ounua. Mar.&Apl.1929. Miss L.E.Cheesman. B.M.1929-343.; 4 specimens BMNH: New Hebrides: Malekula, Ounua, iv.v.1929. Miss L.E.Cheesman. B.M.1929-371.; 3 specimens BMNH: New Hebrides: Malekula. Malua Bay. v.1929. Miss L.E.Cheesman. B.M.1929-410. / 605; 1 specimen BMNH: New Hebrides: Malekula. Malua Bay. vi.1929. Miss L.E.Cheesman. B.M.1929-410.; 1 specimen BMNH: New Hebrides: Santo. viii.1929. Miss L.E.Cheesman. B.M.1929-343.; 1 specimen BMNH: New Hebrides: Banks Is. Vanua Lava. xi.1929. Miss L.E.Cheesman. B.M.1930-8.; 4 specimens BMNH: New Hebrides: Malekula. v.1930. Miss L.E.Cheesman. B.M.1930-393.; 2 specimens BMNH: ONTONG JAVA:

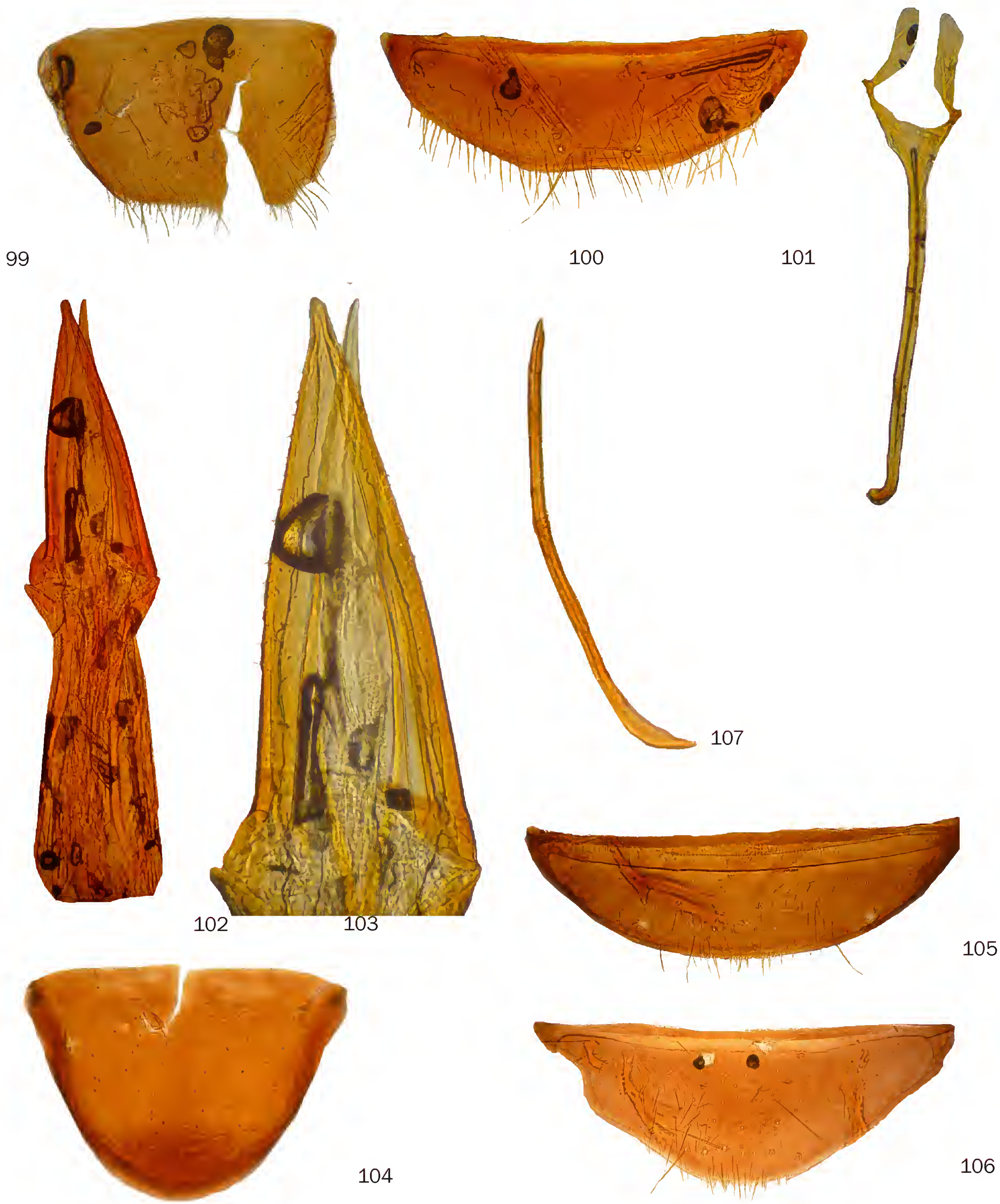
Leuantua. 29.ix.1953. J.D.Bradley / RENNELL I. Expedition. B.M.1954-222.; 1 specimen BMNH: SOLOMON IS. Isabel 2/8. 1962 P. Greenslade 2413. / SOLOMON IS: Pres. P.J.M.Greenslade. B.M.1966-477.; 2 specimens ZMUC: Cook Is., Aitutaki, II.1977, N.L.H.Krauss leg.; 4 specimens [2 ZMUC, 2 DTC]: Cook Is., Aitutaki, XII.1977, N.L.H.Krauss leg.; 1 specimen NME: W-PAPUA Raja Ampat Prov. Salawati Isl. or., Kalobo 01°03'15"S, 131°04'32"E 24.-28.I.2004 leg. A.Skale.
This redescription is based on a male specimen from Malekula Island, Vanuatu.

Measurements, ♂ from Vanuatu: Total body length 3.12 mm, maximum combined width postmedium of elytra 0.86 mm. Head 0.62 mm long, across the eyes 0.60 mm broad, pronotum 0.60 mm long, maximum width 0.50 mm, elytra 1.90 mm long, 0.86 mm broad. Measurements, ♀: Total body length 3.35 mm, maximum combined width across the middle of elytra 1.10 mm. Head 0.65 mm long, across the eyes 0.65 mm broad, pronotum 0.65 mm long, maximum width 0.57 mm, elytra 2.05 mm long, 1.10 mm broad.
Description: Forebody black, reddish brown or orange, head sometimes darker than the pronotum. Elytra black to brown with orange or yellow markings, consisting of a broad postbasal transverse band not or narrowly interrupted on the suture and a broad, somewhat slightly oblique or oval spot in the apical third of each elytron. Antennae and palpi brown, orange or yellow. Legs pale with a dark femora. Underside uniformly brown, yellow or orange, abdominal ventrites somewhat darker. Head very densely punctured, with large prominent eyes. Tempora short, with rounded temporal angles. Head base truncate. Punctures small and very dense, intervening spaces much smaller than punctures. Pubescence whitish, fine, sparse. Antennae long and slender, reaching over the elytral humeri in the male. Second antennomere 1/3 shorter than the next one. Antennomeres 3-8 elongate, slightly thickened distally. Antennomeres 9-10 stronger, thickened distally. Terminal antennomere slightly asymmetric, elongate, conical, blunt, indistinctly longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum very densely punctured dorsally, flattened, broadly rounded anteriorly, narrower than the head. Narrowed postmedium laterally toward base. Punctures very dense but flat, intervening spaces much smaller than punctures. Pubescence whitish, fine, sparse and appressed, with several long erect tactile setae on the sides and on the disc. Scutellum truncate apically. Elytra elongate, smooth dorsally. Punctures large, coarse and dense, getting smaller but not much sparser in the apical third. Intervening spaces irregular but all smaller than the punctures. Pubescence yellowish, fine, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae visible from apices toward basal third. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in the male broadly rounded on apical margin (Fig. 99). Morphological sternite VII in the male short and broad, broadly rounded on apical margin (Fig. 100). Aedeagus pointed, laterally with sparse and very short setae (Figs 102-103). Morphological tergite VII (Fig. 104) - as well as sternite VII - broadly rounded on the apical margin in the female (Figs 105-106).
Sexual dimorphism: Almost not indicated. Females have a slightly more slender profemora than males.
Variability: This species varies in main body colouration from orange to black, and the pale markings of the elytra vary from reddish to yellow. The pale markings of the elytra vary in size; they can also be more or less isolated (interrupted) on the suture. The specimens also significantly vary in body length from 2.50 mm to 3.65 mm (partly from Werner, 1965). The intervening spaces on the head vary strongly in size. In some specimens these are visible and smooth intervening spaces, in other specimens intervening spaces are rugulose and much smaller than the punctures.
Distribution: This species is widely distributed in the Pacific and on some Indian Islands, hitherto recorded as surely known from the Marquesas Islands, Caroline Islands, Cook Islands, Fiji, French Polynesia, Gilbert Islands, Guam Island, Leuantua Atoll (Ontong Java plateau, N of the Solomon Islands), Mariana Islands, Marshall Islands, New Caledonia, Ocean Islands, Palau, Society Islands, Vanuatu, Northern and Eastern Australia, Comoros Islands, India, Indonesia (Borneo, Krakatau, Mentawai, Raja Ampat), Japan (Ryukyu Islands), Kenya (coastal areas), Madagascar, Mascarene Islands (both Mauritius & La Réunion), Sri Lanka, Seychelles, Solomon Islands, Somalia (coastal areas), South African Republic (coastal areas), Tanzania (coastal areas), Thailand, Vietnam.
Remarks: Werner (1965: 261) points to the intervening spaces on the head being smooth and shiny, as large as the punctures. In fact, in many specimens (like Vanuatu's specimen, redescribed above, of Fiji specimens from BMNH) the head and

pronotal disc punctures are extremely dense, not leaving any visible intervening spaces.

Sapintus (s. str.) ***papuus*** (Pic, 1900) (Figs 108-111, map 3, plate 55 figs 1-3)

Lectotype ♀ MSNG [herewith designated]: N.Guinea Dilo Loria VI.VII.90 [printed, black border] / Typus [printed, text red, red border] / papuus Pic [printed, black bor-



Figures 99-107. *Sapintus oceanicus* (LaFerté-Sénectère, 1849a). 99-103: ♂ from Vanuatu. 99 – Tergite VII; 100 – Sternite VII; 101 – Spiculum gastrale; 102 – Aedeagus; 103 – Tegmen of aedeagus. 104-107: ♀♀ specimens. 104 – Tergite VII (Vanuatu); 105 & 106 – Sternite VII (Vanuatu & Santa Isabel Island, Solomon Islands); 107 – Spiculum gastrale (Vanuatu).

der] / Anthicus papuus Pic typus ! [handwritten] / Mus. Civ. Genova [printed].
Paralectotypes 25 specimens [herewith designated]: 20 specimens MSNG: same label as in the lectotype; 1 specimen MNHN: N.Guinea Dilo Loria VI.VII.90 [printed, black border] / type [handwritten] / TYPE [printed, label red] / A. papuus Pic [handwritten]; 1 specimen MNHN: N.Guinea Dilo Loria VI.VII.90 [printed, black border] / type [handwritten] / A. papuus Pic [handwritten]; 3 specimens MNHN: N.Guinea Dilo Loria VI.VII.90 [printed, black border] / type [handwritten].

Measurements, paralectotype ♂: Total body length 3.13 mm, maximum combined width across the middle of elytra 0.95 mm. Head 0.68 mm long, across the eyes 0.66 mm broad, pronotum 0.60 mm long, maximum width 0.58 mm, elytra 1.80 mm long, 0.95 mm broad. Measurements, lectotype ♀: Total body length 3.11 mm, maximum combined width across the middle of elytra 1.02 mm. Head 0.61 mm long, across the eyes 0.69 mm broad, pronotum 0.61 mm long, maximum width 0.56 mm, elytra 1.89 mm long, 1.02 mm broad.
Description: Head black to brown. Prothorax reddish-brown to brown. Elytra brown, with reddish-brown markings in the form of very broad postbasal and preapical transverse spots, both very narrowly interrupted on the suture and not bearing lateral margins. Antennae reddish-brown to brown, two basal antennomeres paler. Maxillary palpi yellowish-brown. Legs brown or yellow with darkened tibiae. Underside uniformly brown to black-brown. Head very densely punctured dorsally, with midsized prominent eyes. Tempora about half the size of the length of an eye, with rounded temporal angles and a very broadly rounded base. Punctures small, very dense and flat. Intervening spaces microstriate and smaller than punctures. Pubescence greyish, fine and dense. Antennae short, reaching the elytral humeri in the male. Second antennomere short, half shorter than the next one in the male. Antennomeres 7-10 thickened distally. Terminal antennomere slightly asymmetric, bluntly conical, indistinctly longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum very densely punctured dorsally, rounded anteriorly, significantly narrower than the head, narrowed postmedium laterally toward base. Punctures large and dense, intervening spaces mostly smaller than the punctures. Pubescence greyish, fine, long and dense, appressed and covering the sculpture of the disc, with separate long erect setae on the sides and the disc. Scutellum broadly rounded apically. Elytra elongate. Punctures large in the basal half, the intervening spaces ranging from smaller than to as large as the punctures. In the apical half, punctures getting smaller and more flat, intervening spaces here mostly larger than punctures. Pubescence greyish, long and dense, appressed. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward middle. Hind wings fully developed. Legs long. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male long, rounded on apical margin (Fig. 108). Morphological sternite VII in male with feeble median excavation on apical margin (Fig. 109). Male aedeagus with tegmen very narrow and strongly prolongated apically (Figs. 110-111).
Sexual dimorphism: Not indicated.
Variability: This species varies in dorsal colouration and in the shape of the pale markings of the elytra, as described above.
Distribution: This species is known from the surrounding areas of Dilo village in Central Province, Papua New Guinea.

Sapintus (s. str.) ***plectilis*** (Pic, 1910) (Figs 112-118, plate 56 figs 7-8)
Type material: Not studied.
Additional material: 2 specimens OUNH: Celeb Wallace / Coll (1830-73) W W Saunders Ex coll. H.E. Cox id.1916 Mrs. Cox / Hope Entomological Collection Ex. Cabinet 6, drw 9.

This redescription is based on a male specimen from Tiammu Shan, Zhejiang, Southern China.
Measurements, ♂: Total body length 2.50 mm, maximum combined width across the middle of elytra 1.00 mm. Head 0.55 mm long, across the eyes 0.53 mm broad, pronotum 0.50 mm long, maximum width 0.45 mm, elytra 1.45 mm long, 1.00 mm broad. Measurements, ♀: Total body length 2.42 mm, maximum combined width postmedium of elytra 0.90 mm. Head 0.57 mm long, across the eyes 0.52 mm broad, pronotum 0.45 mm long, maximum width 0.46 mm, elytra 1.40 mm long, 0.90 mm broad.
Description: Dorsum and venter uniformly yellow or pale yellow-brown, the forebody often orange. Antennae, palpi and legs paler. Elytra in some specimens with an indistinct oval postmedian dark spot on the suture. Head smooth and shiny dorsally, with midsized prominent eyes. Tempora slightly shorter than the eye length, with rounded temporal angles. Base truncate to subtruncate. Punctures large and dense, intervening spaces smaller than

punctures. Pubescence yellowish, fine and sparse. Antennae heavy, in both sexes reaching the elytral humeri. Second antennomere in both sexes as long as the next one. Antennomeres 4-6 in male strongly shortened, 6th antennomere transverse. Antennomeres 7-10 strongly enlarged and thickened, with 7th antennomere the longest and 10th the shortest among the four. Penultimate antennomere in male is short, transverse. Terminal antennomere asymmetric, bluntly conical, twice longer than the penultimate one. In the female, there are no modified antennomeres. Terminal maxillary palpomere somewhat axeform. Pronotum dorsally smooth, broadly rounded anteriorly, narrower than head. Constricted postmedium laterally toward base. Punctures dense and coarse, intervening spaces much smaller than punctures. Pubescence yellowish, fine, long and sparse, appressed, with separate long erect setae on the sides and the disc. Scutellum broadly rounded apically. Elytra elongate ovoid, smooth and shiny dorsally. Punctures large and coarse in the basal half, intervening spaces smaller than punctures. In the apical third, punctures getting finer but not sparser. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae broad, developed in the apical third only. Hind wings fully developed. Legs long and slender. Male mesotarsi as long as mesotibiae. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male excavated on apical margin (Fig. 112). Morphological sternite VII in male short and broad, broadly rounded on apical margin (Fig. 113). Aedeagus of male short, slightly spatulate-like, widened in apical part, with thin prolongate apex (Figs 115-116). Morphological tergite VII in female large, narrowly rounded on apical margin (Fig. 117). Morphological sternite VII in female short and very broad, broadly rounded on apical margin (Fig. 118).

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Figures 108-111. *Sapintus papuus* (Pic, 1900), holotype ♂. 108 – Tergite VII; 109 – Sternite VII; 110 – Aedeagus; 111 – Tegmen of aedeagus.

Sexual dimorphism: Females with antennomeres 7-9 not enlarged and 4-6 not unusually small.

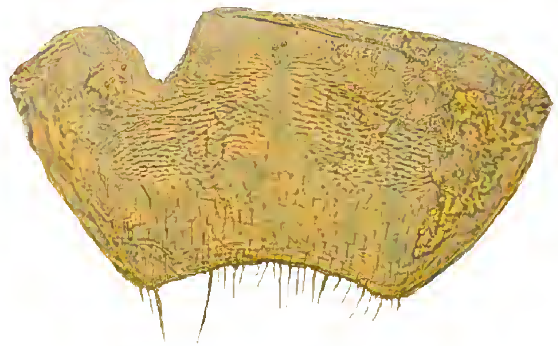
Variability: Some specimens have a weakly defined dark postmedian spot on the suture. Body length varies from 2.20 to 2.80 mm.

Ecology & biology: Young (1984), Hemp (1994) and Hemp & Dettner (2001) listed this species among canthariphilous Anthicidae. This species is easy recognizable among other Oriental *Sapintus*, consequently it is highly possible that it was identified correctly.

Distribution: This species is widely distributed on the Asian mainland and hitherto recorded in Southern and Eastern China, India, Taiwan, Thailand, and Vietnam. Records from Sulawesi are the only from the insular systems of SE Asia. It is not impossible that historical specimens (OUNH) are mislabelled.

Sapintus (s. str.) ***quadrinotatus*** (Pic, 1900) (Figs 119-121, map 3, plate 56 figs 1-2)
Holotype ♂ MSNG: N.Guinea Ighibirei Loria VII.VIII.90 [printed, black border] / Typus [printed, text red, red border] / quadrinotatus Pic [handwritten, black border] / A. quadrinotatus Pic n sp [handwritten] / Mus. Civ. Genova [printed].

Measurements, holotype ♂: Total body length 3.12 mm, maximum combined width immediately behind the middle of elytra 0.99 mm. Head 0.61 mm long, across the eyes 0.61 mm broad, pronotum 0.60 mm long, maximum width 0.51 mm, elytra 1.93 mm long, 0.99 mm broad.
Description: Forebody orange. Elytra yellow or pale orange with brown markings in the form of five narrow and irregularly shaped transverse bands. Antennae and palpi orange, legs slightly paler.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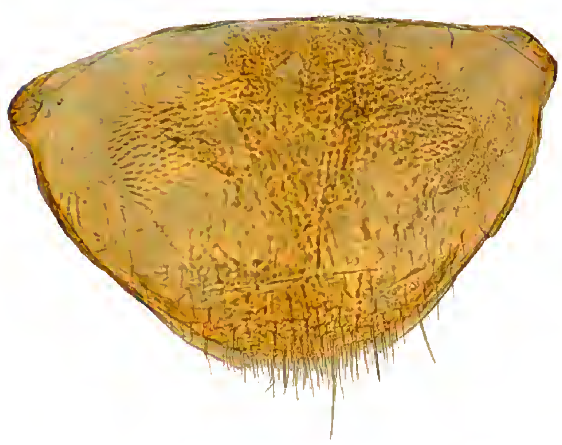
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Figures 112-118. *Sapintus plectilis* (Pic, 1910), specimens from Sapa env., Northern Vietnam. 112-116: ♂. 112 – Tergite VII; 113 – Sternite VII; 114 – Spiculum gastrale; 115 – Aedeagus; 116 – Tegmen of aedeagus. 117-118: ♀. 117 – Tergite VII; 118 – Sternite VII.

Underside uniformly orange. Head smooth dorsally, densely punctured on frons, with very large prominent eyes. Tempora broadly rounded together with base. Punctures irregular, from small to large, dense and very flat. Intervening spaces ranging from smaller than to as large as punctures. Punctures sparser on the vertex, which is smooth. Pubescence whitish, fine and quite dense. Antennae long and slender, reaching over the elytral humeri in the male. Second antennomere in male 1/3 shorter than the next one. Antennomeres 3-8 elongate and slender, slightly thickened distally, 9-10 slightly shortened, thickened distally. Terminal antennomere slightly asymmetric, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum very densely punctured on the disc, smooth and shiny on antero-lateral angles, rounded anteriorly, significantly narrower than the head. Strongly constricted postmedium laterally toward narrow base. Punctures on disc small but very dense and coarse, intervening spaces much smaller than punctures. Pubescence whitish, fine, long and dense, appressed and covering sculpture of disc, with separate long erect setae on the sides and the disc. Scutellum rounded apically. Elytra elongate, smooth dorsally. Humeral angles strongly rounded. Punctures large and sparse in basal half, intervening spaces ranging from as large to two times larger than punctures. In the apical half punctures getting smaller, intervening spaces here mostly larger than punctures. Pubescence yellowish, long and sparse, appressed. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Male metatibiae slightly thickened. Male basal tarsomere of the metathoracic legs longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII and sternite VII were not studied. Aedeagus with narrowly rounded apex (Figs 119-121).

Sexual dimorphism: Female is unknown.

Distribution: This species was originally collected at Ighibieri (= Igibira) village in Western Province, Papua New Guinea. Later, it was recorded from Friedrich-Wilhelm Harbour (Madang Province) and from the surroundings of Port Moresby (Central Province). A record from New South Wales, Australia (Uhmann 2000) seems outside of the species' range and very dubious, and needs further confirmation.

Sapintus (s. str.) ***rugosicollis*** (Pic, 1900) (Plate 56 figs 3-4)

Lectotype ♀ MSNG [herewith designated]: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / Typus [printed, text red, red border] / rugosicollis Pic [handwritten, black border] / A. rugosicollis Pic n sp. [handwritten] / Mus. Civ. Genova [printed].

Paralectotypes 2 specimens MNHN [herewith designated]: Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten] / TYPE [printed, label red] / rugosicollis Pic [handwritten]; Nuova Guinea Fly River L.M.D'Albertis 1876-77 [printed, black border] / type [handwritten].

Measurements, lectotype ♀: Total body length 3.12 mm, maximum combined width across the middle of elytra 1.10 mm. Head 0.57 mm long, across the eyes 0.70 mm broad, pronotum 0.62 mm long, maximum width 0.51 mm, elytra 1.99 mm long, 1.10 mm broad.

Description: Forebody red, elytra black-brown with the preapical area very slightly paler. Antennae brown with basal antennomere pale reddish. Palpi and legs brown, latest with reddish femora. Underside brown, procoxae- and trochanters red. Head very densely punctured dorsally, with large prominent eyes. Tempora 1/3 shorter than the length of an eye, temporal angles rounded. Head base truncate. Punctures small and flat but very dense. Intervening spaces much smaller than punctures. Pubescence white, fine, short and sparse. Antennae slender, reaching slightly over the elytral humeri in

119 120 121

Figures 86-94. *Sapintus quadrinotatus* (Pic, 1900), holotype ♂. 119 – Aedeagus, dorsal view; 120 – Aedeagus, lateral view; 121 – Tegmen of aedeagus, lateral view.

the female. Second antennomere in female almost half shorter than the next one. Antennomeres 3-8 elongate and slender, slightly thickened distally. Penultimate antennomere slightly shortened and indistinctly thickened. Terminal antennomere asymmetric, bluntly conical, 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum very densely punctured dorsally, rounded anteriorly, significantly narrower than the head. Constricted from the anterior third laterally toward the base. Punctures larger than on the head but flat, intervening spaces much smaller than the punctures. Pubescence whitish, fine, short and sparse, appressed. Some hairs look like slender elongate scales, especially near the base of the pronotum, with separate long erect setae on sides and disc. Scutellum triangular. Elytra elongate, densely coarsely punctured dorsally. Punctures large and dense, not or almost not getting smaller toward apices. Intervening spaces irregular in size, smaller than the punctures. Pubescence greyish, short and sparse, appressed. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs long and slender. Female basal tarsomere of the metathoracic legs longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in female broadly rounded on apical margin. Morphological sternite VII in female was not studied.

Sexual dimorphism: Male not studied.

Distribution: This species is only known by the holotype collected by L.M. D'Albertis on the River Fly in the southern lowlands of Papua New Guinea and without precise locality. D'Albertis reached up to 580 miles (~937 km) upriver during his expedition. Consequently, the locus typicus of this species is somewhere between the delta and 937 km of the River Fly course.

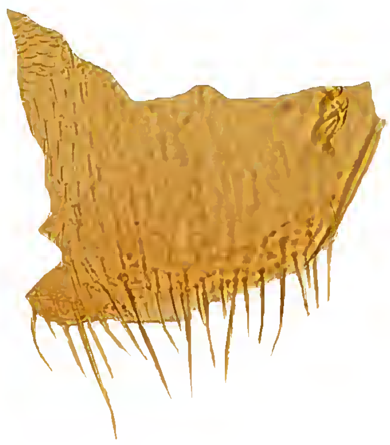
Sapintus (s. str.) ***semirugosus*** (Pic, 1902) (Figs 122-124, plate 57 figs 1-3)

Holotype ♂ HMNH: N. Guinea Biró 1898 [printed] / Stephansort Astrolabe Bai [sic!] [printed] / Momo – [handwritten] typus [printed, text red] 1902 Anthicus semirugosus Pic [handwritten] [label border red] / A. semirugosus Pic n sp. [handwritten, by M.Pic] / Anthicus semirugosus Pic [handwritten] det. M. Pic [printed] Typus ! [handwritten, text red].

Additional material: 1♂ DTC: N. Guinea Biró 1898 [printed] / Stephansort Astrolabe Bai [sic!] [printed] / 3108 [printed] / A. dilensis Pic [handwritten].

Measurements, holotype ♂: Total body length 2.75 mm, maximum combined width across the middle of elytra 0.90 mm. Head 0.61 mm long, across the eyes 0.60 mm broad, pronotum 0.49 mm long, maximum width 0.51 mm, elytra 1.65 mm long, 0.90 mm broad.

Description: Forebody red. Elytra black to reddish brown with orange or yellow markings consisting of a broad postbasal transverse band narrowly interrupted on the suture and a narrower oblique transverse spot in the apical third of each elytron. The upper margin of the preapical spot is not straight. Antennae pale on 3-4 basal antennomeres, rest of antennae darkened. Legs orange or yellow, femora darker than tibiae. Underside with red to reddish brown thorax, brown abdominal ventrites and orange last visible tergite. Head very densely punctured, with midsized prominent eyes. Tempora straight, with rounded temporal angles, slightly shorter than the eye length. Head base truncate. Punctures of different sizes but very dense and flat, intervening spaces much smaller than punctures. Especially on the frons, intervening spaces between large punctures are covered by small and dense punctures. Pubescence yellowish, fine, sparse. Antennae long, reaching over the elytral humeri in the male. Second antennomere slightly shorter than the next one. Antennomeres 3-7 elongate, slightly thickened distally. Antennomeres 8-10 shorter and thickened. Terminal antennomere elongate, conical, pointed, 1/4 longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum very densely punctured dorsally, flattened, broadly rounded anteriorly, narrower than the head. Strongly constricted postmedium laterally toward base. Punctures large and very dense, but flat. Intervening spaces smaller than punctures, rugulose. Pubescence yellowish, fine, sparse and appressed, with several long erect tactile setae on the sides and on the disc. Scutellum triangular. Elytra elongate. Punctures large, coarse and dense, getting smaller and sparser in apical third. Intervening spaces irregular, in the basal part mostly smaller than or as large as the punctures, in the preapical part up to three times larger than the punctures. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae almost complete, visible from apices toward postbasal fourth. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male broadly rounded on apical margin, covered with very long setae (Fig. 122). Morphological sternite



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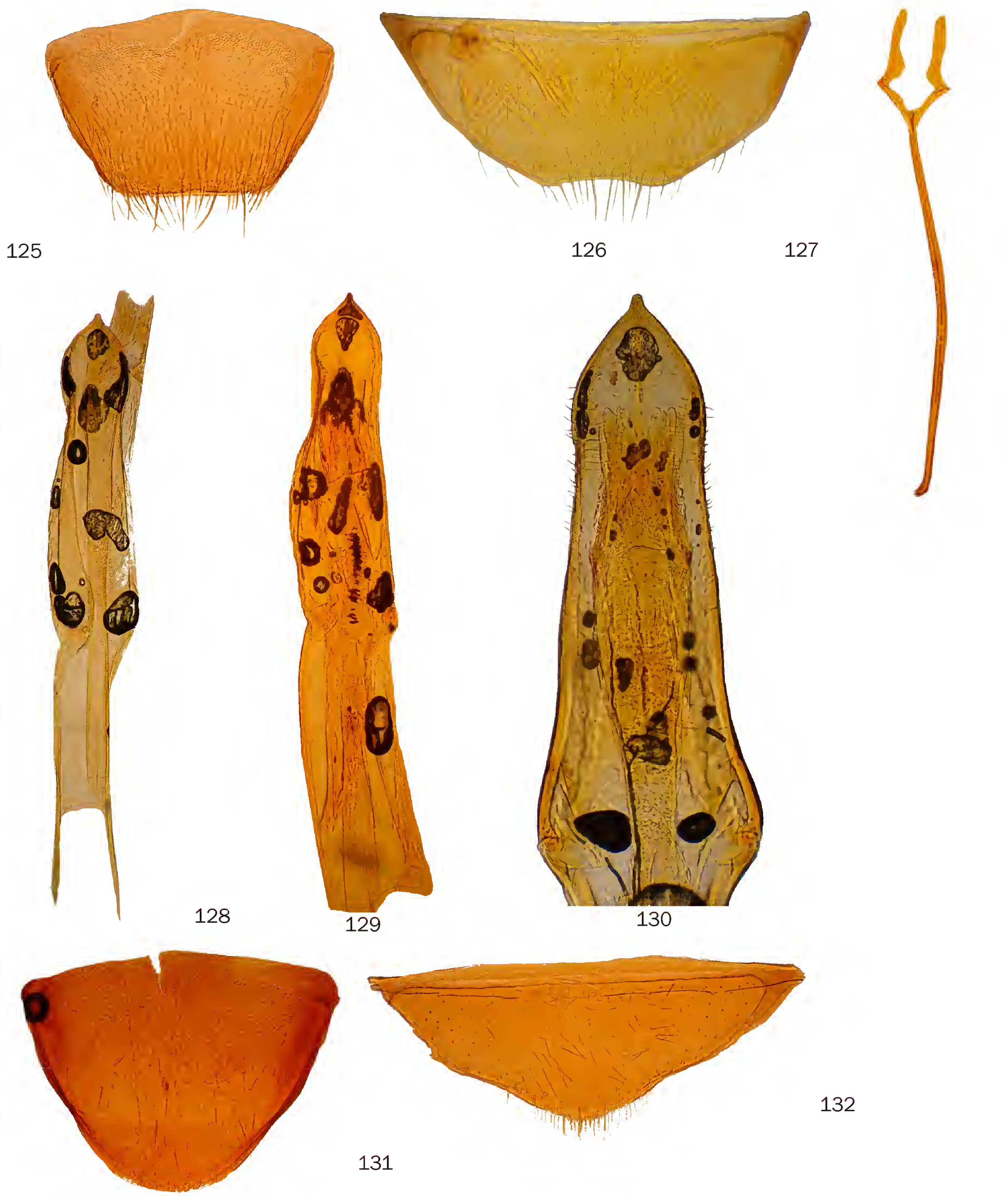
Figures 122-124. *Sapintus semirugosus* (Pic, 1902), holotype ♂. 122 – Tergite VII; 123 – Sternite VII; 124 – Aedeagus.

VII in male broadly rounded on apical margin, covered with very long setae (Fig. 123). Aedeagus with tegmen tapered apically (Fig. 124).
Sexual dimorphism: Female is unknown.
Distribution: This species is only known from the type locality, Stephansort, in Madang Province, Papua New Guinea.

Sapintus (s. str.) ***sexualis* sp. nov.** (Figs 125-132, map 3, plate 57 figs 4-5)
Holotype ♂ NME: W-PAPUA Raja Ampat Pr. Waywesar/ Batanta, 2km E 45'17"S, [sic!] 130°48'06"E 18.I.2004 leg.A.Weigel.
Paratypes 9 specimens. 1♂ & 1♀ NME, 1♂ DTC: same labels as in holotype; 1♂ & 2♀ NME, 1♀ DTC: W-PAPUA Raja Ampat Pr. Waywesar/Batanta bor. 0°45'26"S, 130°46'55"E 13.I.2004 leg.A.Weigel; 1♀ NME: W-PAPUA Raja Ampat Prov. Batanta Isl. bor., Waywesar 0°45'26"S, 130°46'55"E 15.I.2004 leg. A.Skale UWP; 1♀ NME: W-PAPUA Raja Ampat Prov. Batanta Isl. mer., Wallebet 0°54'01"S, 130°39'37"E 18.-21.I.2004 leg. A.Skale; 1 specimen NME: W-PAPUA Manokwari Prov. vic. Mokwam (Siyoubrig), 1400-1800m, 01°06.26'S 133°54.41'E, 24.-28.II.2007 leg. A. Skale; 1 specimen NME, 1 specimen DTC: W-PAPUA Manokwari Prov.24km SSE Manokwari, Warami 01°10.50'S 134°09.16'E, 02.III.2007 leg. A. Skale; 1 specimen NME: W-PAPUA Manokwari Pr. 14km NE Ransiki,Warbiatu (Oransbari), 01°18.25'S 134°14.14'E, 02.III.2007 leg. A.Weigel cut. area; 2 specimens NME: W-PAPUA Manokwari Prov. 18km NE Ransiki, 01°21.05'S 134°12.46'E, 02.-08. III.2007 leg. A. Skale cutting area.

Derivatio nominis: Named from Latin 'sexualis' [female, female sex], because of the distinctly thickened female metatibiae.
Measurements, holotype ♂: Total body length 3.15 mm, maximum combined width across the middle of elytra 0.92 mm. Head 0.68 mm long, across the eyes 0.61 mm broad, pronotum 0.60 mm long, maximum width 0.57 mm, elytra 1.87 mm long, 0.92 mm broad. Measurements, paratype ♀: Total body length 2.41 mm, maximum combined width across the middle of elytra 0.78 mm. Head 0.56 mm long, across the eyes 0.48 mm broad, pronotum 0.45 mm long, maximum width 0.41 mm, elytra 1.40 mm long, 0.78 mm broad.
Description: Forebody brown to orange, head usually darker. Elytra black with pale markings, consisting of an orange broad postbasal transverse band and a broad transverse spot in the apical third of each elytron. Anterior band is bearing the lateral margin of the elytra and is not interrupted on the suture. Posterior spots not bearing lateral margin and are distinctly interrupted on the suture. Antennae and palpi yellow to orange, antennomeres 5-11 usually slightly darkened. Legs yellow with slightly darkened metatibiae. Underside reddish-brown to brown, pro- and mesocoxae yellow. Head opaque, with large prominent eyes, very densely and coarsely punctured. Tempora slightly prolongated, narrowly rounded together with base. Punctures flat, very dense, intervening spaces smaller than punctures. The vertex is much sparser, smooth and shiny. Pubescence yellowish, fine and long. Antennae in both sexes reaching the elytral humeri. Second antennomere in male 1/4 shorter than the next one. Antennomeres 3-7 elongate, slightly thickened distally. Antennomeres 9-10 shortened and stronger, thickened distally. Terminal antennomere tapered 1/4 longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum broadly rounded anteriorly, significantly narrower than the head, strongly constricted postmedium laterally toward narrow base. Very densely and confusedly punctured on disc,

intervening spaces much smaller than the punctures. Antero-lateral angles smooth, dense but not coarsely punctured. Pubescence yellowish, fine, long and dense, appressed, with several long erect tactile setae on the sides and on the disc. Scutellum triangular, narrowly rounded apically. Elytra elongate and slightly widened across the middle, smooth dorsally. Humeri rounded. Postbasal transverse impression feeble. Punctures large, getting smaller in the apical third. Intervening spaces mostly smaller than punctures. Pubescence yellowish, long and dense, suberect, with numerous very



Figures 125-132. *Sapintus sexualis* sp. nov. 125-130: ♂♂ paratypes from Manokwari env., Indonesian New Guinea. 125 – Tergite VII; 126 – Sternite VII; 127 – Spiculum gastrale; 128 & 129 – Aedeagus; 130 – Tegmen of aedeagus. 131-132: ♀ paratype from Manokwari env., Indonesian New Guinea. 131 – Tergite VII; 132 – Sternite VII.

long erect to suberect tactile setae present on the disc. Undersetae directed obliquely laterally. Sutural striae broad, completely developed. Hind wings fully developed. Legs stout. Metatibiae thickened in both sexes, but much stronger in females rather than in males. Basal tarsomere of the metathoracic legs in both sexes longer than the combined length of the remaining metathoracic tarsomeres. Basal tarsomere of the metathoracic legs in both sexes thickened. Morphological tergite VII in male short, trapezoid, truncate or very feebly excavate on apical margin (Fig. 125). Morphological sternite VII in male short and broadly but feebly excavate on apical margin (Fig. 126). Male aedeagus with tegmen slightly widened in apical part, pointed apically and setose laterally in preapical area (Figs 128-130); setation may be absent in certain specimens. Morphological tergite VII in female narrowly rounded and with long setation on apical margin (Fig. 131). Morphological sternite VII in female broadly rounded on apical margin (Fig. 132).

Sexual dimorphism: Metatibiae stronger thickened in the female rather than in male. Antennae comparatively shorter in the female.

Variability: The size and shape of the pale elytral markings vary. Specimens vary in body length from 2.60 to 3.30 mm.

Ecology & biology: Specimens collected in lowland and lower montane (1400-1800 m) rainforests during the daytime.

Differential diagnosis: *Sapintus sexualis* sp. nov. is close to *S. celeripes* sp. nov. (described above; Bird's Neck isthmus of New Guinea, Salawati Island of Raja Ampat Islands), *S. geminus* sp. nov. (described above; Papua New Guinea: Madang Province) and *S. horvathi* (Pic, 1902) (New Guinea & Central Moluccas). The tegmen of the aedeagus is not pointed apically in *S. geminus*, and is not widened preapically in *S. celeripes* and *S. horvathi*.

Distribution: This species is known from Batanta Island (Raja Ampat Islands) and the northern part of Bird's Head peninsula (Indonesian New Guinea).

Remarks: The holotype label has incorrect data on the longitude, with a degree digit of South longitude missing.

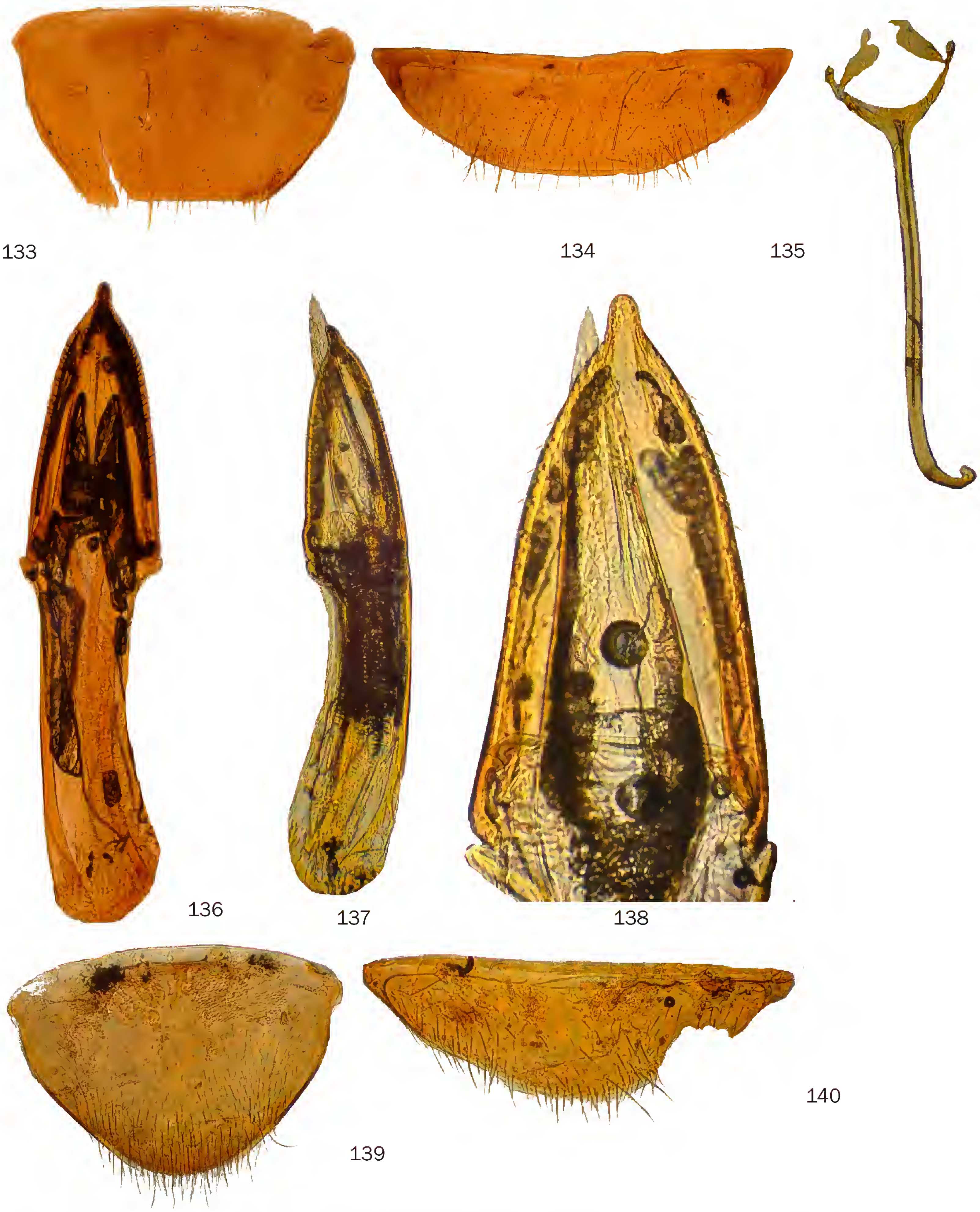
Sapintus (s. str.) ***vexator*** (Werner, 1965) (Figs 133-140, plate 58)

Paratypes 2♂ DCC: GILBERT IS. Buiartum I. Onotoa Atoll VIII-3-1951 [printed] / PacificSciBd. E.T.Moul,Collr. #200 at light [printed] / PARATYPE Anthicus vexator Werner [handwritten] / PARATYPE [printed, label blue] / F.G.Werner collection [printed].

Additional material: 2 specimens OUNH: Jul 1900. Noumea. N. Caledonia. H.M.S.'Ring-arooma'. 1902. / E.M.M.pp.189-203. dd 1928 J.J.Walker / Anthicus oceanicus Laf.; 18 specimens DTC: Vietnam (Central), Nge [sic!] Tinh prov., Cnalo N Vinh, 17.XII.1962, leg. O.L.Kabakov; 4 specimens DTC: Ср. Вьетнам пляж моря Куало 17.12.1963 Кабаков; 1 specimen NME, 1 specimen DTC: THAILAND,S,ca. 8 km E Khao Lak,08°36'36"N 98°14'61"E,plantage Umg.Merlin resort,30.VII.-14.VIII.2007,leg.A.Skale; 4 specimens NME, 1 specimen DTC: S-Thailand, ca. 8km s. Khao Lak, 08°36'36"N 098°14'61"E plantage, Umg. Merlin resort leg. A. Skale, 30.7. - 11.8.2007.

Measurements, paratype ♂: Total body length 3.45 mm, maximum combined width across the middle of elytra 1.20 mm. Head 0.70 mm long, across the eyes 0.70 mm broad, pronotum 0.65 mm long, maximum width 0.60 mm, elytra 2.10 mm long, 1.20 mm broad.

Description: Forebody orange to yellow. Elytra black to brown with orange or yellow markings, consisting of a broad postbasal transverse band not or narrowly interrupted on the suture and a broad, somewhat slightly oblique spot in the apical third of each elytron. Antennae, palpi and legs yellow or pale orange. Underside uniformly yellow or pale orange, with pro- and mesocoxae being somewhat paler. Head densely punctured, with large prominent eyes. Tempora straight, with rounded temporal angles, much shorter than the eye length. Head base slightly concave. Punctures very dense but flat, intervening spaces smaller than punctures, microreticulate. Pubescence yellowish, fine, sparse. Antennae short, barely reaching the elytral humeri in the male. Second antennomere half shorter than the next one. Antennomeres 3-7 elongate, slightly thickened distally. Antennomeres 9-10 shorter and thickened. Terminal antennomere short, conical, pointed, as long as or slightly longer than the penultimate one. Terminal maxillary palpomere broad, somewhat axeform. Pronotum very densely punctured dorsally, flattened, broadly rounded anteriorly, narrower than the head. Constricted laterally postmedium toward base. Punctures very dense but flat, intervening spaces much smaller than punctures. Pubescence yellowish, fine, sparse and appressed, with several long erect tactile setae on the sides and on the disc. Scutellum broadly triangular. Elytra elongate, smooth dorsally. Punctures large, coarse and dense, getting smaller but not much sparser in the apical third. Intervening spaces irregular, mostly smaller than or as large as the punctures. Pubescence yellowish, fine, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae visible from the apices toward the basal third. Hind wings fully developed. Frontal margins of mesepisterna with a couple of long setae directed upwards; these setae are exposed from under the humeri in the dorsal view. Legs long and slender. Male basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male truncate on the apical margin (Fig. 133). Morphological sternite VII in male short and broad, broadly rounded on the apical margin (Fig. 134). Male aedeagus broad



Figures 133-140. *Sapintus vexator* (Werner, 1965). 133-138: ♂♂ from Kualo env., Central Vietnam. 133 – Tergite VII; 134 – Sternite VII; 135 – Spiculum gastrale; 136 & 137 – Aedeagus; 138– Tegmen of aedeagus. 139-140: ♀ from Kualo env., Central Vietnam. 139 – Tergite VII; 140 – Sternite VII.

with apex shortly narrowed, pointed with or without short lateral preapical setae (Figs 136-138). Morphological tergite VII in female narrowly rounded on apical margin (Fig. 139). Morphological sternite VII in female broadly rounded on apical margin (Fig. 140).
Sexual dimorphism: Females have a slightly more slender profemora than males.
Variability: This species varies in body colouration from pale brown to black, and the pale markings of the elytra vary from reddish to pale yellow. Specimens also significantly vary in body length from 2.93 mm to 3.80 mm (Werner 1965). The most important variable character is the density of the punctures on the forebody, especially the pronotum. In specimens from Micronesia punctures are often very fine and dense (intervening spaces much smaller than punctures), but in specimens from continental Asia, pronotal punctures are much larger, with clearly visible microreticulate intervening spaces. The head base is much more distinctly notched medially in certain specimens. The shape of the pronotum is more elongate in certain specimens. An anterior pair of pale elytral spots often takes almost the whole anterior half of the elytra (like in paratypic specimens from Gilbert Islands); anterior spots tending to anastomose across the suture in generally paler coloured specimens, but are distinctly separated on the suture in darker individuals. Lateral setae on the aedeagus can be absent or present (may depend on the age of specimens).
Ecology & biology: Recorded from *Portulaca lutea* Soland. ex G.Forst. (Werner 1965). Collected both at daytime and at light. The species inhabits both natural and antropogenous habitats. It is not recorded from inland or montane areas, distributed mostly along the coast.
Distribution: This species is widely distributed on the Pacific Islands, hitherto recorded from the Caroline Islands, Marshall Islands, Gilbert Islands, Hawaii, and New Caledonia. It is also recorded from Sri Lanka, Vietnam & Thailand. Currently there are no known records from the Indo-Australian transition zone, but it seems obvious that this species occurs in the study region.

Commented species list of *Sapintus* s. str. from the Indo-Australian transition zone

Only original descriptions and references with data from the study area are listed. For distribution of species please refer to maps 2-6.

Anthicinae Latreille, 1819
Anthicini Latreille, 1819
Sapintus Casey, 1895: 732
Type species: *Anthicus pubescens* LaFerté-Sénectère, 1849, by Werner, 1962

Subgenus ***Sapintus*** s. str. Casey, 1895: 732
Type species: *Anthicus pubescens* LaFerté-Sénectère, 1849, by Werner, 1962

Sapintus adonis (Pic, 1900)
References: Pic (1900: 605), as *Anthicus Adonis*; Pic (1911: 31), as *Anthicus Adonis*.
Distribution: Trans-Fly lowlands (southern Papua New Guinea).

Sapintus airi sp. nov.
Distribution: Makira (= San Cristobal, San Cristoval) and Guadalcanal islands (Solomon Islands).

Sapintus albertisi (Pic, 1900)
References: Pic (1900: 605), as *Anthicus Albertisi*; Pic (1911: 31), as *Anthicus Albertisi*; Uhmann (2000: 151), new combination.
Distribution: Trans-Fly lowlands and Papuan Peninsula (Papua New Guinea).

Sapintus alfurus (Pic, 1900)
Pic (1900: 608), as *Anthicus*; Pic (1911: 31), as *Anthicus*.
Distribution: Papuan Peninsula (E Papua New Guinea).

Sapintus celeripes sp. nov.
Distribution: Southern Bird's Neck isthmus of New Guinea, Salawati Island (Raja Ampat Islands).

Sapintus curvitibia sp. nov.
Distribution: Makira Island (= San Cristobal, San Cristoval) (Solomon Islands).

Sapintus dilensis (Pic, 1900)
= *Anthicus dilensis* var. *Csikii* Pic, 1902
= *Sapintus relatus* Bonadona, 1981 [consider new synonymy above]
References: Pic (1900: 607), as *Anthicus*; (Pic 1902: 409) as *Anthicus Ciskii* (var. de *dilensis* ?); Pic (1911: 44), as *Anthicus dilensis* and ? var. *Csikii*; Uhmann (1990: 142), new combination; Uhmann (1995a: 525): Uhmann (2000: 151): Telnov (2006a: 62), new synonymy.
References *S. relatus*: Bonadona (1981: 196).
Distribution: North Moluccas (Halmahera Island), Raja Ampat Islands (Batanta Island, Waigeo

Island), Indonesian Papua (Bird's Head Peninsula, Bird's Neck isthmus, northern coast), Papua New Guinea (Papuan Peninsula, Madang & Morobe Provinces) and Bismarck Archipelago (Lavongai Island, New Britain Island).

Sapintus dyaulensis nom. nov.
References: Bonadona (1981: 201), as *Sapintus propinquus*.
Distribution: Dyaul (= Djaul) Island (Bismarck Archipelago), Indonesian Papua (Bird's Neck isthmus). Record from Thailand (Telnov 1999) is based on misidentified specimen.

Sapintus geminus sp. nov.
Distribution: Adelbert Range (Madang Province, E Papua New Guinea).

Sapintus gemitus sp. nov.
Distribution: Central Sulawesi.

Sapintus gracilicornis (Pic, 1895)
= *Anthicus neoguineensis* Pic, 1900 [consider new synonymy above]
= *Anthicus gracilicornis* v. *semiobliteratus* Pic, 1900 [consider new synonymy above]
= *Sapintus repentinus* Bonadona, 1981 [consider new synonymy above]
References *S. gracilicornis*: Pic (1895: 94), as *Anthicus*; Pic (1911: 51), as *Anthicus*, erroneously mentioned 'Sumbawa' in distribution; Uhmann (1990: 142), new combination; Uhmann (1995a: 525).
References *A. neoguineensis*: Pic (1900: 607), as *Anthicus*; Pic (1911: 63), as *Anthicus*.
References var. *semiobliteratus*: Pic (1900: 607 footnote 1), as *Anthicus gracilicornis* v. *semiobliteratus*; Pic (1911: 51), as var. *semiobliteratus*.
References *S. repentinus*: Bonadona (1981: 199).
Distribution: East Malaysia (Sabah), Indonesia (Kalimantan, Sulawesi), the Philippines (Balabac, Luzon, Tawi-Tawi), New Guinea (both Indonesian & Papua New Guinea). Also reported from islands of Sumbawa (Lesser Sunda Islands, Indonesia) and Banguey (East Malaysia), but without specimens corresponding to these localities.

Sapintus hirtipennis (Pic, 1900)
References: Pic (1900: 604), as *Anthicus*; Pic (1911: 52), as *Anthicus*.
Distribution: Papuan Peninsula (E Papua New Guinea).

Sapintus horvathi (Pic, 1902)
References: Pic (1902: 407), as *Pseudoleptaleus Horváthi*; Pic (1911: 29), as *Leptaleus (Pseudoleptaleus) Horvathi*; Uhmann (1995a: 525), as *Pseudoleptaleus*; Uhmann (2000: 149), as *Pseudoleptaleus*; Telnov (2007: 71), new combination.
Distribution: Morobe Province & Yule Island (near southern coast of Papuan Peninsula, Papua New Guinea), Cenderawasih Bay (Biak & Yapen islands), Central Moluccas (Seram Island), Queensland (North Australia). North Australian record has not been anatomically confirmed.

Sapintus insulanus (Pic, 1900)
References: Pic (1900: 607), as *Anthicus*; Pic (1911: 56), as *Anthicus*; Uhmann (1990: 142), as *Hirticomus*; Uhmann (2000: 150), as *Hirticomus*; Uhmann (2007: 44), as *Hirticolles*.
Distribution: Yule Island (near the southern coast of Papuan Peninsula, Papua New Guinea), Morobe Province (Papua New Guinea). Records by Uhmann (2000, 2007) from Queensland (northern Australia) and Bird's Head Peninsula of New Guinea need further confirmation.

Sapintus insularis (Werner, 1965)
= *Sapintus placitus* Bonadona, 1981 [consider new synonymy above]
References: Werner (1965: 266), as *Anthicus*; Werner (1967: 311-312), as *Anthicus*; Bonadona (1981: 195), as *Sapintus placitus*.
Distribution: Caroline Islands, Marshall Islands, Hawaii, Dyaul (= Djaul) Island (Bismarck Archipelago).

Sapintus javanus (Marseul, 1882a)
= *Anthicus javanus* Marseul, 1882b [duplicative description]
= *Anthicus luteonotatus* Pic, 1913
= *Sapintus sodalis* (Pic, 1895) [consider new synonymy above]
References: Marseul (1882a: 62), as *Anthicus;* Marseul (1882b: 121), as *Anthicus;* Pic (1911: 56), as *Anthicus.*
Distribution: Greater Sunda Islands (Java, Sulawesi, Sumatra, whole of Borneo), southern and eastern China (inclusive Hong Kong), India (whole territory except arid areas on the West), Japan, West Malaysia, Sri Lanka, Taiwan, Thailand, Vietnam, New Guinea (both Indonesian and Papua New Guinea).

Sapintus loriae (Pic, 1900)
References: Pic (1900: 606), as *Anthicus Loriae*;

Pic (1911: 59), as *Anthicus Loriae*.
Distribution: Papuan Peninsula (E Papua New Guinea).

Sapintus macrops sp. nov.
Distribution: Nabire area (northern Bird's Neck isthmus, Indonesian New Guinea).
Sapintus madangensis Uhmann, 1995
References: Uhmann (1995a: 523); Uhmann (2000: 152).
Distribution: Papuan Peninsula and Madang Province (E Papua New Guinea).

Sapintus malayensis (Pic, 1895)
References: Pic (1895: 94), as *Anthicus*; Pic (1911: 60), as *Anthicus*.
Distribution: Sumbawa (Lesser Sunda Islands), Central Sulawesi. All other records based or certainly based on misidentifications.

Sapintus malut sp. nov.
Distribution: North Moluccas (islands of Bacan, Halmahera, Hiri, and Ternate).

Sapintus oceanicus (LaFerté-Sénectère, 1849a)
= *Anthicus oceanicus* LaFerté-Sénectère, 1849b [homonym]
= *Anthicus oceanicus* var. *Françoisi* Pic, 1902 [consider new synonymy above]
= var. *guamensis* Blair, 1942
References: LaFerté-Sénectère (1849a: 70), as *Anthicus Oceanicus*; LaFerté-Sénectère (1849b: 170), as *Anthicus Oceanicus*, homonymy; Blair (1942: 57), as variety *guamensis*; Werner (1965: 261), as *Anthicus*, new synonymy.
Distribution: This species is mainly distributed on Indian and Pacific islands, as also along coastal areas of African, Asian and Australian mainland. Hitherto recorded from Australia (northern coast and Cocos Keeling islands), Comoros Islands, Cook Islands (Rarotonga), Fiji, French Polynesia, Guam, Hong Kong, India (western coast), Indonesia (Borneo, Krakatau, Mentawai Islands, Sulawesi, Sumatra), Japan (Ryukyu Islands), Kenya, Leuantua atoll (Ontong Java plateau N of Solomon Islands), Madagascar, Marquesas Islands, Mascarene Islands (both Mauritius & Reunion), New Caledonia, the Philippines (Luzon, Palawan), Samoa, Seychelles Islands, Society Islands, Somalia, South African Republic, Sri Lanka, Tanzania, Thailand, Vanuatu, Vietnam, numerous Micronesian islands.
Note: Not yet confirtmed but should be present also on New Guinea and Solomon Islands.

Sapintus papuus (Pic, 1900)
References: Pic (1900: 603), as *Anthicus*; Pic (1911: 66), as *Anthicus*; Uhmann (1990: 143), new combination.
Distribution: Papuan Peninsula and Morobe Province (E Papua New Guinea).

Sapintus plectilis (Pic, 1910)
References: Pic (1910: 71), as *Anthicus*; Pic (1911: 67), as *Anthicus*; Uhmann (1983: 204), new combination; Uhmann (1994: 674), mentioned 'Sulawesi' without specimen locality data.
Distribution: Southern and eastern China, India (whole territory except arid areas on the West), Indonesia (Sulawesi), Taiwan, Thailand, Vietnam. Records from Sulawesi possible based on mislabelled specimens.

Sapintus quadrinotatus (Pic, 1900)
References: Pic (1900: 604), as *Anthicus*; Pic (1911: 69), as *Anthicus*; Uhmann (2000: 151), as *Anthicus*.
Distribution: Papuan Peninsula and Madang Province (E Papua New Guinea).
Note: Uhmann (2000) recorded this species from Mount Victoria in New South Wales, Australia. Later, in his review of Australian Anthicidae Uhmann (2007) did not mention this species again. Record from New South Wales seems very dubious for this species and needs further confirmation.

Sapintus rugosicollis (Pic, 1900)
References: Pic (1900: 606), as *Anthicus*; Pic (1911: 71), as *Anthicus*; Uhmann (1990: 143), new combination.
Distribution: Trans-Fly lowlands and Madang Province (Papua New Guinea). Record from Cook Islands (Telnov 1999) is based on misidentified specimens of *S. oceanicus* (LaF.).

Sapintus semirugosus (Pic, 1902)
References: Pic (1902: 410), as *Anthicus*.
Distribution: Madang Province (E Papua New Guinea).

Sapintus sexualis sp. nov.
Distribution: Batanta Island (Raja Ampat Islands), Manokwari area (Bird's Head Peninsula, Indonesian New Guinea).

Sapintus vexator (Werner, 1965)
References: Werner (1965: 264), as *Anthicus*.
Distribution: Caroline Islands, Gilbert Islands, Hawaii, Marshall Islands, New Caledonia, New Heb-

rides, Peninsular Malaysia, the Philippines (Luzon, Panay), Singapore, Sri Lanka, Thailand, Vietnam.

Note: Not yet confirtmed but should be present also on New Guinea and Solomon Islands.

Identification key to *Sapintus* s. str. species from the Indo-Australian transition zone

This original key to adult *Sapintus* from the study area is primarily based on external morphology characters. When necessary, differences in structure of genital organs also being discussed.

1 Elytral pubescence simple, long and erect, without short undersetae. Forebody red to orange, elytra black with orange apical third .... *S. adonis*

- Elytral pubescence double, with dense undersetae arranged obliquely laterally in most species. Dorsal colouration different 2

2 Dorsal body more or less uniformly dark, black or brown, or forebody darker than brown elytra. Appendages dark or pale 3

- Dorsal body generally dark or pale, or distinctly bi- or multi-coloured. Appendages dark or pale 5

3 Head dorsum roughly punctured, with evident smooth intervening spaces. Head with impunctate median longitudinal line .... *S. alfurus*

- Head dorsum very densely punctured, at least on frons, intervening smooth spaces not evident. Head without impunctate median line 4

4 Tempora much shorter than eye, clearly shorter than one third of eye length. Pronotum distinctly widened in anterior half. Elytral punctures small and fine .... *S. insularis*

- Tempora about one third of eye length. Pronotum rounded, barely widened anteriorly. Elytral punctures large and deep .... *S. albertisi*

5 Elytra pale with more than three brown or black irregular transverse bands of various widths, which can be complete or interrupted along suture 6

- Elytra if pale then with less than three transverse brown or black bands 7

6 Male aedeagus tripartite apically .... *S. madangensis*

- Male aedeagus monopartite apically, bluntly pointed .... *S. quadrinotatus*

7 Forebody distinctly paler than uniformly dark elytra 8

- Forebody not or not distinctly paler than general colouration of elytra. Elytra not uniformly dark coloured, pale with dark markings or vice versa 10

8 Tempora about one third of eye length. Pubescence sparse and short on dorsal forebody .... *S. rugosicollis*

- Tempora shorter than one third of eye length. Pubescence on forebody longer and denser 9

9 Punctuation of head consisting of comparatively large punctures with intervening spaces (partly microstriate or micropunctate) being larger than main punctures .... *S. loriae*

- Punctuation of head consisting of small and dense punctures, intervening spaces smaller than punctures .... *S. macrops*

10 Dorsal body uniformly yellow or pale brown, or with darker transverse median or postmedian spot or band on elytra 11

- Dorsal body colouration different 12

11 Elytra usually without dark markings. Pronotal punctuation generally denser with comparatively smaller intervening spaces. Male antennomeres 7-10 derivative (strongly modified: 7^{th}-9^{th} widened and elongated, 10^{th} widened and shortened) .... *S. plectilis*

- Elytra with large irregular median brown spot. Pronotal punctuation generally less dense. Male unknown .... *S. insulanus* (is known only from the female holotype, therefore its correct identification may be difficult)

12 Body small (2.27 mm). Head base distinctly truncate. Male antennomeres 7-10 derivative (strongly modified: 7^{th}-9^{th} widened and elongated, 10^{th} widened and shortened). Elytra with base narrowly dark and two narrow, curved transverse dark bands. Pronotum ovoid .... *S. monstrosiantennatus*

- Without this combination of characters 13

13 Body small (2.2-2.4 mm). Eyes small, tempora about as long as eye length. Head base subtruncate. Pronotum distinctly narrowed posteriad. Dorsal punctuation coarse, at least on pronotum intervening spaces smaller than punctures. Two pale spots on each elytron, postmedian spot smaller than anterior .... *S. javanus*

- Without this combination of characters 14

14 Pronotal punctuation dense and coarse, irregular, intervening spaces therefore also very irregular in size. Head smooth, sparsely punctured. Elytra with dark shoulders, broad dark median transverse band (posterior margin is somewhat rounded in this band) and dark apices. Male aedeagus with narrow and prolongate tegmen apex (Figs 84-85) .... *S. malayensis*

- Without this combination of characters. Pronotal punctuation less coarse and with more regular intervening spaces. Male aedeagus different 15

15 Forebody reddish or yellow, elytra yellow with dark humeri, apices and median transverse band (more or less strongly interrupted on suture). Pronotal disc densely punctured, intervening spaces smaller than punctures 16

- Dorsal body colouration if pale then reddish not yellow or intervening spaces between punctures on pronotal disc at least as large as punctures 17

16 Tempora about as long as eye length. Head base very broadly rounded, subtruncate .... *S. airi*

- Tempora distinctly shorter than eye length. Head base broadly rounded .... *S. hirtipennis*

17 Dorsal punctuation very dense, at least on head and pronotal discs, intervening spaces not evident or smaller than punctures. Dorsal forebody distinctly opaque (species with very dense punctured forebody but smooth intervening spaces considered in both couplets) 18

- Dorsal punctures even when large and dense always with smooth intervening spaces not smaller than punctures. Dorsal forebody more or less smooth 26

18 Metatibiae derivative – distinctly thickened in both sexes. Head base narrower rounded, prolonged posterior to eyes (Plate 57, figs 5, 7). Forebody smooth on intervening spaces, not or slightly opaque. Male aedeagus with tegmen preapically widened (Figs 128-130) .... *S. sexualis*

- Metatibiae simple, if derivative (thickened) than only in females (when also in males, than insignificantly thickened). Head base broadly rounded or truncate, not prolonged. Forebody opaque on intervening spaces (can be partly smooth in *S. celeripes, S. densepunctatus* and *S. vexator*). Male aedeagus different 19

19 Male aedeagus with tegmen strongly constricted and elongate in apical part (Figs 110-111). Forebody dorsal punctuation large and crateriform (also smaller punctures present on head) .... *S. papuus*

- Male aedeagus different. Forebody dorsal punctuation often minute, if larger than punctures not crateriform .. 20

20 Intervening spaces on head dorsum at least partly microreticulate. Head base truncate or almost truncate, with more or less distinct median notch. Variable species with forebody very dense to relatively sparse punctate. Elytra black each with two yellow spots very variably in size. Legs yellow .... *S. vexator*

- Intervening spaces not evident but when evident - not microreticulate. Head base not notched medially 21

21 Head base distinctly rounded 22

- Head base truncate or subtruncate 23

22 Metatibiae derivative in females, distinctly thickened. Forebody red or dark orange. Male aedeagus with tegmen pubescent preapically .... *S. celeripes*

- Metatibiae derivative in both sexes but thickened insignificantly. Forebody black, base of pronotum pale in certain specimens. Male aedeagus with tegmen glabrous .... *S. malut*

23 Punctures on dorsal forebody of two sizes, with sparser large punctures between very dense micropunctures ... . *S. dilensis*

- Punctures on dorsal forebody more or less uniform in size.. 24

24 Forebody smooth on intervening spaces .... *S. densepunctatus*

- Forebody opaque, intervening spaces almost not evident 25

25 Posterior elytral pale spot oval or circular, not or indistinctly prolongate anteriad along suture. Male aedeagus tegmen microsetose laterally. Forebody usually black or brown. Very variable species .... *S. oceanicus*

- Posterior elytral pale spot more cylindrical, aligned obliquely (prolonged anteriorly along suture). Male aedeagus tegmen glabrous. Forebody reddish .... *S. semirugosus*

26 Head base distinctly rounded 27

- Head base truncate or sbtruncate 31

27 Punctuation of dorsal forebody very dense, intervening spaces at least partly much smaller than punctures . 28

28 Metatibiae distinctly derivative – thickened in both sexes or in females only. Femora uniformly coloured 29

- Metatibiae distinctly derivative – thickened in both sexes or in females only. Femora bicoloured - pale in basal, darker in distal half 30

29 Metatibiae distinctly thickened in both sexes. Head base narrower rounded, prolonged posterior to eyes (Plate 57, figs 5, 7). Forebody smooth on intervening spaces, not or slightly opaque. Male aedeagus with tegmen glabrous (Figs 128-130) .... *S. sexualis*

- Metatibiae distinctly thickened only in females, distinctly thickened. Head base comparatively broader rounded. Male aedeagus with tegmen pubescent preapically (Figs 12-13) .... *S. celeripes*

30 Male aedeagus tegmen broadly rounded apically .... *S. geminus*

- Male aedeagus tegmen bluntly pointed apically .... *S. horvathi*

31 Intervening spaces on head dorsum at least partly microreticulate. Head base truncate or almost truncate, with more or less distinct median notch. Variable species with forebody very dense to relatively sparsely punctate. Elytra black each with two yellow spots very variably in size. Legs yellow........ *S. vexator*

- Intervening spaces not microreticulate. Head base not notched medially 32

32 Punctures on dorsal forebody of two sizes, with sparser large punctures between very dense micropunctures .... *S. dilensis*

- Punctures more or less uniformly on dorsal forebody 33

33 Forebody red or orange. Male aedeagus tegmen narrow, pubescent laterally .... *S. gemitus*

- Without this combination of characters 34

34 Pronotum strongly campanulate - widened in anterior half and strongly constricted posteriorly. Pronotal disc with a shallow track of longitudinal impression. Male metatibiae derivative - slightly curved. Antennae very long .... *S. curvitibia*

- Pronotum either cylindrical or slightly campanulate, without evidence of longitudinal impression on the disc. Metatibiae not modified 35

35 Tegmen shorter than phallobase. Tegmen strongly narrowed apically with strongly prolonged apex (Figs 35-36) .... *S. dyaulensis*

- Tegmen about as long as phallobase. Tegmen narrowed apically but with less strongly prolonged apex 36

36 Generally larger species, body length 3.25-5.30 mm. Posterior pale spot of elytra more transverse with anterior margin curved, not straight (this characters is of course variable). Male aedeagus generally more slender, tegmen pubescent laterally (Figs 61-65) .... *S. gracilicornis*

- Generally smaller species, body length about 3.25 mm. Posterior pale spot of elytra ovoid, its anterior margin evenly rounded. Male aedeagus generally stouter, tegmen glabrous (Figs 26-27) .... *S. densepunctatus*

Geographic distribution and endemism in *Sapintus* s. str. from the Indo-Australian transition zone

The highest species diversity (72%, or 22 species of a total of 31) is registered from New Guinea, with another 6 species (19%) being recorded from Sulawesi (Tab. 2). Smaller islands (the Moluccas, the Bismarck Archipelago or Raja Ampat) are represented by lower *Sapintus* species diversity. Unfortunately, the material available for this study is not enough to be able to make final conclusions and only sketches the possible general pattern for this genus in the study region.

Most of the main islands, or insular systems in general, demonstrate high rates of geographical endemism (66% for the Solomon Islands, 59% for New Guinea, 33% for Sulawesi and the North Moluccas). On the other hand, no endemic species have hitherto been recorded from the Bismarck Archipelago, Raja Ampat or the Lesser Sunda Islands, principally due to the lack of material.

New Guinea is widely known for the high level of geographical isolation between different parts of this large island, and also between its geographical features, like peninsulas or montane ridges. An attempt to assess the diversity and endemism of *Sapintus* in various parts of New Guinea is presented in Tab. 3.

The Central Cordillera, (and also the Ramu River valley with the Adelbert & Finisterre mountains) is characterised by the highest species diversity of *Sapintus* on the island. Registered endemism is high in the same areas, plus the southern lowlands (67%, 80% and 75% respectively). Again, the studied material was not enough to be able to make final decisions and my assessment only represent the current state of our knowledge.

Only reliable information was used for this assessment; dubious records were not considered.

Table 2. Diversity and rate of endemism in *Sapintus* species from the Indo-Australian transition zone.

Island Group	**Island / part of an island**	***Sapintus* species registered**	**Rate of endemism**
Bismarck Archipelago	Dyaul (= Djaul)	2	0%
	Lavongai	1	0%
	New Britain	1	0%
Lesser Sunda Islands	Sumbawa	1	0%
North Moluccas (region)		3	33%
	Halmahera	3	0%
	Hiri	1	0%
	Ternate	1	0%
Central Moluccas	Seram	2	0%
New Guinea, island (satellite islands excluded)		22	59%
	Indonesian Papua (Cenderawasih Bay excluded)	8	12%
	Papua New Guinea	15	67%
Cenderawasih Bay Islands	Biak	1	0%
	Yapen	1	0%
Sulawesi, island		6	33%
Sulawesi (North)		2	0%
Sulawesi (Central)		4	50%
Sulawesi (South)		1	0%
Raja Ampat Islands (region)		4	0%
	Batanta	2	0%
	Salawati	2	0%
	Waigeo	2	0%
Solomon Islands (region)		3	66%
	Guadalcanal	1	0%
	Makira (= San Cristobal)	2	50%
	Santa Isabel	1	0%

Table 3. Diversity and endemism of *Sapintus* in the various geographical systems of New Guinea.

Territory	***Sapintus* species registered**	**Rate of endemism**
Bird's Head Peninsula (in total)	3	0%
Arfak & Tamarau Mts.	3	0%
Cenderawasih Bay islands	2	0%
Bird's Neck isthmus	3	33%
Central Cordillera (Papuan Peninsula & Owen Stanley Mts.)	5	60%
North New Guinea: Cyclops Mts.	1	0%
East New Guinea: Finisterre & Adelbert Mts., Ramu River valley (Madang surroundings sensu lato)	5	80%
Southern New Guinea (Trans-Fly, Merauke, Asmat)	4	75%

Species richness and endemism of *Sapintus* s. str. at different altitudes

The first assessments of the role of altitudinal vegetation zones and their possible affect on Anthicidae species diversity were made by Telnov (2011a & b) for Tomoderinae and Macratriinae, respectively. Also, members of *Sapintus* demonstrate some preferences for specific types of vegetation = vertical component (Tab. 4). Data currently available on *Sapintus* are not sufficient to be able to make final decisions. The greatest number of *Sapintus* species is found in the lowland zone (13 species of a total of 31), which is distinctly greater than the species diversity in the lower montane (1 species, *S. monstrosiantennatus* sp. nov.) zone. No species were recorded from the upper montane zone. One species (*S. sexualis* sp. nov.) is not fitting in any of the zones.

Table 4. Number of the Papuan *Sapintus* species recorded for altitudinal zones.

Lowland zone (0-700 m / 200 m zone overlap allowed)	13 species
Lower montane zone (701-1800 m / 200 m zone overlap allowed)	1 species
Species shared in-between lowland & lower montane zones	1 species
Species shared in-between lowland & lower montane zones	1 species
Upper montane zone (2901-3900 m / 200 m zone overlap allowed)	0 species
Species not fitting in any of the zones (altitudinal interval > than 900 m)	1 species
Elevation data deficient	16 species

Annex 1: New descriptions, redescriptions and new records of *Sapintus* s. str. from the Oriental and Australian region

Sapintus (s. str.) ***andreaskopetzi* sp. nov.** (Figs 141-142, plate 59 figs 1-2)

Holotype ♀ NME: **NEPAL P: Seti/D: Bajhang** 12 km NE Chainpur, Talkot Gad S of Talkot, N29°36'17", E81°17'54", 1400m, 28.VI.2009 leg. A.Kopetz riverside #37.

Derivatio nominis: Patronymic. Named after Andreas Kopetz (Erfurt, Germany) - well-known German coleopterist and the first collector of this species.

Measurements, holotype ♀: Total body length 4.98 mm, maximum combined width across the middle of elytra 1.52 mm. Head 1.03 mm long, across the eyes 0.90 mm broad, pronotum 0.95 mm long, maximum width 0.68 mm, elytra 3.0 mm long, 1.52 mm broad.

Description: Dorsal surface black, elytra with two dark orange transverse bands. The anterior one covering almost the whole basal third of the elytra (leaving only a narrow black basal area) is bearing the lateral margins of the elytra and is not interrupted on the suture; the posterior one is almost half as broad as the anterior, situated in the apical third, very narrowly interrupted on the suture and almost bearing the lateral margins of the elytra. Antennae brown with basal antennomere black and terminal - pale brown. Palpi are brown. Femora bicoloured, yellow basally, black distally. Tibiae black, yellowish distally. Tarsi yellowish brown. Underside of head and prothorax black, meso-, metathorax and abdominal ventrites reddish black. Head smooth and shiny, with midsized and moderately prominent eyes. Tempora indistinctly shorter than the eye length, slightly converging toward base, with rounded temporal angles. Head base very broadly rounded and shallowly notched medially. Punctures small, fine and sparse, intervening spaces much broader than punctures. Areas posterior to each eye somewhat more densely punctured than the rest of the head dorsum. Pubescence whitish, fine and sparse. Antennae slender, reaching over the base of the elytra in the female. Second antennomere in female short, about 1/2 the size of the third antennomere. Antennomeres 3-5 elongate and slender, of which the 3rd antennomere is distinctly the longest. Antennomeres 6-9 shorter than previous ones, slightly thickened distally. Penultimate antennomere cylindrical, slightly shorter than the previous one. Terminal antennomere in female elongate, blunt, 1/3 longer than penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum smooth and shiny dorsally, rounded anteriorly, significantly narrower than the head, with a feeble lateral postmedian transverse impression. Punctures vary in size but are generally large, deep and quite dense. Intervening spaces vary in size, ranging from much larger than to nearly as large as the punctures. Pubescence whitish, fine, and sparse. Anterior margin with a line of short dense

setae. Scutellum truncate apically. Elytra strongly elongate, smooth and shiny. Punctures large, deep and dense, irregularly arranged. Punctures getting much more flat in the apical third. Intervening spaces irregular in size, smaller than the punctures in the basal half but slightly larger than the punctures in the apical third. Pubescence yellowish, long and dense, suberect. Undersetae directed obliquely laterally. Sutural striae complete and broad. Hind wings fully developed. Legs very long and slender. Female meso- and metatarsi as long as their tibiae respectively. Female basal tarsomere of the metathoracic legs as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in female narrowly rounded on apical margin (Fig. 141). Morphological sternite VII in female broadly rounded on apical margin (Fig. 142).
Sexual dimorphism: Male is unknown.
Ecology & biology: The holotype was sampled on riverside at an altitude of 1400 m.
Differential diagnosis: This species is similar to several East Palaearctic, Oriental and Papuan species of *Sapintus* - large in size and with pale bands or spots on the elytra, namely *S. binhensis* (Pic, 1922) (Vietnam), *S. cochaeres* (Lewis, 1895) (Japan, Far East of Russia), *S. cruciellus* (Marseul, 1882a) (Indonesia: Java), *S. dyaulensis* Telnov (consider name change above; Bismarck Archipelago & New Guinea), *S. gracilicornis* (Pic, 1895) (widespread in Oriental and Papuan region), *S. hirtisetosus* (Marseul, 1884) (Indonesia: Sumatra, the Philippines: Luzon, Palawan), *S. inspoliatus* Bonadona, 1981 (The Philippines: Tawi-Tawi), *S. litorosus* (Lewis, 1895) (Japan), *S. longehirsutus* (Pic, 1922) (Vietnam), *S. longepilosus* (Pic, 1942) (China, without precise location), *S. marseuli* (Pic, 1892) (Japan, Eastern and Southern China, Nepal, Taiwan, Thailand, Vietnam), *S. nomurai* Nardi, 2004 (Japan: Ryukyu Islands), *S. subrubrocinctus* (Marseul, 1882a) (Indonesia: Sumatra; records from Peninsular Malaysia and Borneo published by Uhmann need confirmation), and *S. triparticornis* (Pic, 1926) (Vietnam). Some of them (*S. hirtisetosus*, *S. longehirsutus*, *S. marseuli*, *S. subrubrocinctus*, *S. triparticornis*) have a red or dark red pronotum or whole forebody. *S. litorosus* is generally pale on the elytra, with dark areas restricted to a median transverse band (interrupted on the suture) and also the black base and apices. The male of this species has modified intermediary antennomeres 4-6 (the male is unknown in *S. andreaskopetzi*). Elytral pubescence in *S. andreaskopetzi* is not as extraordinarily long as in *S. binhensis*, *S. longehirsutus* or *S. longepilosus*. The head base is distinctly truncate in *S. marseuli* and *S. triparticornis*, but broadly rounded in *S. andreaskopetzi*. Punctures of the head are fine and sparse in *S. andreaskopetzi*, not like in any of the afore-listed species (head more coarse/densely punctured in all of them except *S. binhensis* and *S. marseuli*). *S. binhensis* have strongly elongate male antennomeres 7-10; female antennomeres are much less slender than in *S. andreaskopetzi*. This new species is also remarkably large, with holotype's body length almost 5.0 mm - a really rare case in *Sapintus*. *S. cruciellus* differs in having the head base truncate and a denser punctured forebody.
Distribution: Only known from Nepal.

Sapintus (s. str.) ***angulapex* sp. nov.** (Figs 143-145, plate 59 figs 3-4)
Holotype ♀ NHMB: PHILIPPINES, 150 m Palawan, PORT BARTON 14.-18.Dec. 1990 Bolm lgt.

Derivatio nominis: Named from the Latin 'angulus' [angle] + 'apex' [apex, top], because of the dent-like prolongated apices of the elytra.
Measurements, holotype ♀: Total body length 3.42 mm, maximum combined width across the middle of elytra 0.95 mm. Head 0.71 mm long, across the eyes 0.70 mm broad, pronotum 0.70 mm long, maximum width 0.56 mm, elytra 2.01 mm long, 0.95 mm broad.
Description: Dorsum reddish orange, elytra paler


141


142

Figures 141-142. *Sapintus andreskopetzi* sp. nov., holotype ♀. 141 – Tergite VII; 142 – Sternite VII.

with black markings in the form of a broad median transverse band (narrowly interrupted on the suture) and a black preapical spot (leaving extreme apices of the elytra yellow). Legs, palpi and antennae yellow. Underside uniformly reddish orange, trochanters yellow. Head smooth dorsally, with midsized, not very strongly prominent eyes. Tempora almost straight, slightly shorter than the eye length, with rounded temporal angles. Head base very broadly rounded, subtruncate. Punctures are of two sizes. Large punctures are quite deep, irregularly dispersed with intervening spaces ranging from smaller than to larger than these punctures. Small and fine punctures are unevenly dispersed between the large punctures. Pubescence yellowish, short and very fine, dense. Antennae long and slender, reaching postbasal impression of elytra in the female. Second antennomere in female short, half the size of the third antennomere. Antennomeres 3-6 elongate and slender, thickened distally. Antennomeres 7-10 stouter, more thickened, 10th antennomere is the shortest among them. Terminal antennomere asymmetrical, elongate and blunt, twice as long as the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum opaque dorsally, broadly rounded anteriorly, narrower than the head, strongly narrowed postmedium toward base. Punctures vary in size but are generally larger than on the head, dense and coarse, regularly dispersed, with intervening spaces ranging from much smaller than to about as large as the punctures. Intervening spaces densely microreticulate. Also, anterolateral angles of pronotum densely punctate and microreticulate. Pubescence yellowish, short and dense, appressed. Scutellum truncate apically. Elytra strongly elongate, smooth dorsally. Postbasal transverse impression weak but broad and visible. Each sutural angle ends in a long dent (in females only?). Punctures large and deep, irregularly dispersed, getting much finer postmedium. Intervening spaces vary in size, ranging from smaller than to twice as large as the punctures. Pubescence yellowish, comparatively short, fine and dense, appressed, with several very long erect tactile setae on the sides and the disc. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward postbasal impression. Legs long and slender. Female metatibiae slightly thickened in the median part. Female basal tarsomere of the metathoracic legs longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in female broadly rounded on apical margin and covered with dense long setae (Fig. 143). Morphological sternite VII in female broadly rounded on apical margin and covered with dense setae (Fig. 144).

Sexual dimorphism: Male is unknown.

Ecology & biology: Collected at an altitude of 150 m.

Differential diagnosis: This species is very distinctive due to modifications of the elytral apices (only by females?).

Distribution: Only known from Palawan Island (the Philippines).

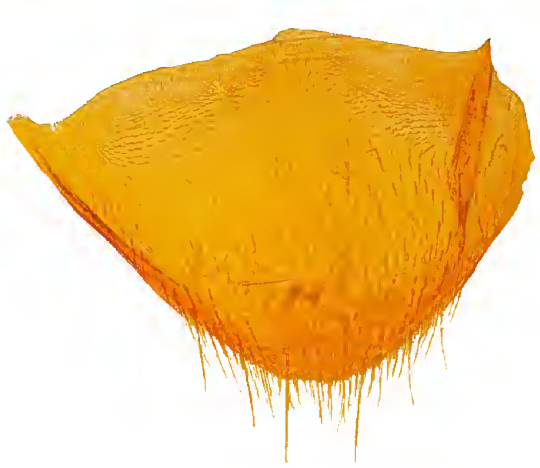
Sapintus (s. str.) ***anguliceps*** **(LaFerté-Sénectère, 1849a)** (Figs 146-151, plate 59 figs 5-6)

= *Anthicus anguliceps* LaFerté-Sénectère, 1849b [duplicative description]

= *Sapintus apicatus* (Fairmaire, 1896) [consider new synonymy above]

= *Sapintus apicatus birmanicus* (Pic, 1907) [consider new synonymy above]

Material: 1 specimen BMNH, Spore / SINGAPORE: C.J.Saunders. B.M.1933-227.; 1 specimen ZIN, ВЬЕТНАМ, горы NW ТХАЙ-НГУЕН, 300 м, 13.9.1962 г., Кабаков; 1 specimen ZIN, 60 км W Винь-Линь, Вьетнам, 100-500 м, Кабаков, 18.III.1963; 9 specimens ZIN, 2 specimens DTC, Ср. Вьетнам, р. Кон Фукун, 9.10.1963, Кабаков; 2 specimens ZIN,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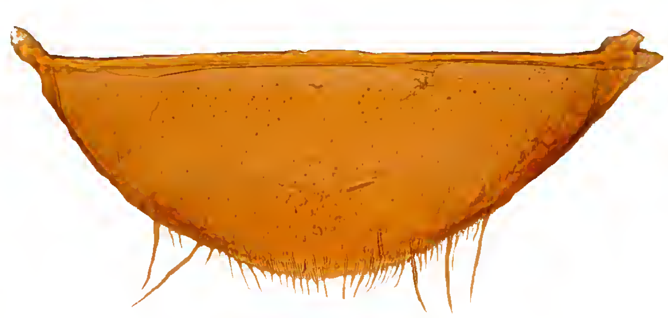
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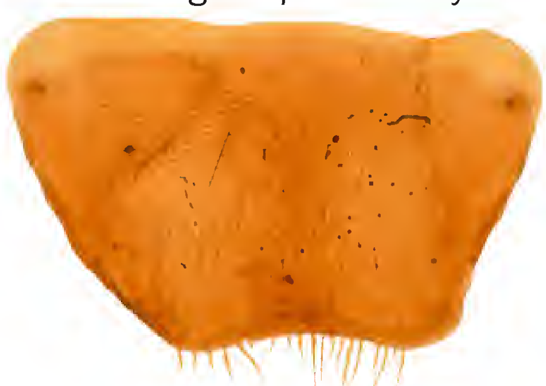
Figures 143-145. *Sapintus angulapex* sp. nov., holotype ♀. 143 – Tergite VII; 144 – Sternite VII; 145 – Spiculum gastrale.

1 specimen DTC, Сев. Вьетнам, 40 км NO Тхайнгуен, 30.10.1963, Кабаков; 2 specimens MHUB, Borneo, Sabah Kinabatangan 22.VIII.2005, LF leg. Mey & Ebert; 1 specimen NME, THAILAND Khao Lak, Hotel Similana, 2 km NE, geklopft U.Schmidt 8.-22.XI.2007; 1 specimen IRSN, Coll. I.R.Sc.N.B. Cambodia, Pursat prov. Phnom Samkos W.S. Pramaoy, forest edge Light trap 16.iv.2005 Leg. K. Smets & I. Var; 2 specimens NME, S-Thailand, ca. 8km s. Khao Lak, 08°36'36"N 098°14'61"E plantage, Umg. Merlin resort leg. A. Skale, 30.7. - 11.8.2007; 56 specimens NME, 5 specimens DTC, INDIA, Tamil Nadu Distr. Vilupparam Auroville, 12°0'N 79°48'E,leg. F. Burger 01.VIII.-05.X.2012; 2 specimens NME, 2 specimens DTC, VIETNAM, N, Ninh Binh Pr. 90 km SW Hanoi Cuc PhuongNP, primat [sic!] rescue centre, 25.IV. / 2012, 190m, 20°14'24"N 109°42'53"E, leg. A. Weigel, light trap.

Remarks: All published records and identifications of *S. anguliceps* made by Uhmann need further confirmation, because this author not studied the type of this species.

Sapintus (s. str.) ***aucklandensis*** **(Werner, Chandler, 1995)**

Material: 1 specimen BMNH, ? NEW ZEALAND / Sharp Coll. 1905-313.; 1 specimen OUNH, Auckland H.Swale / ex. J. J. Walker bequest 1939; 3 specimens OUNH, Nelson NZ-2/02 JJWalker / ex. J. J. Walker bequest 1939; 5 specimens OUNH, 2 specimens DTC, Wellington NZ 8/1902 JJWalker / ex. J. J. Walker bequest 1939; 4 specimens OUNH, Wellington, N.Z. J.J.Walker. Aug. 1902 / ex. J. J. Walker bequest 1939; 1 specimen OUNH, 1 specimen DTC, 15. IX. 1939. N.ZEALAND, Wellington, Paekakariki. G.V.HUDSON. 1010-1940; 10 specimens BMNH, 2 specimens DTC, litter / AK: 12km S Waiuku / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 2 specimens BMNH, litter / AK: TUAKAU 9.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, grass heaps / AK:Auckland Wattle Bay 11.i.1984 / NEW ZEA-



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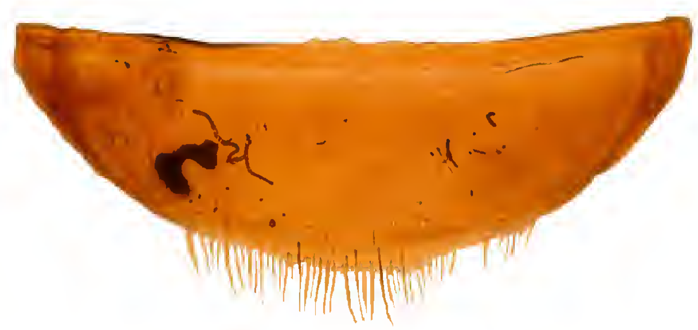

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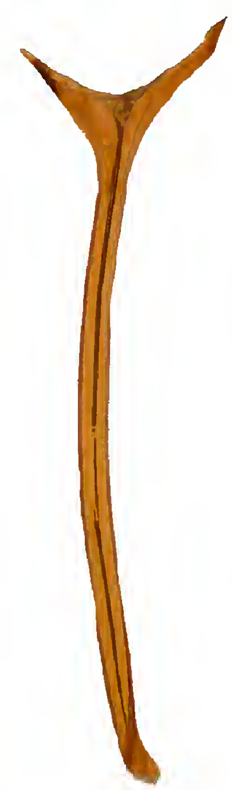

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Figures 146-151. *Sapintus anguliceps* (LaFerté-Sénectère, 1849), ♂♂ specimens from Cambodia and Thailand. 146 – Tergite VII; 147 – Sternite VII; 148 – Spiculum gastrale; 149 – Aedeagus; 150-151 – Tegmen of aedeagus (dorsal & dorso-lateral views).

LAND B.M. 1984-80 P.M.Hammond; 2 specimens BMNH, Tidal refuse / WO:Port Waikato shore debris 12.ii.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen HMNH, NEW ZEALAND, Waikato District, Pirongia Forest, 21.I.1995,Z.Korsós.

Remarks: First records since original description.

Sapintus (s. str.) ***bataviensis*** **(Marseul, 1882a)** (Plate 59 figs 7-8)

= *Anthicus bataviensis* Marseul, 1882b [duplicative description]

Syntype RMNH: de Gavere Batavia [handwritten] / 132a bataviens [handwritten].

Remarks: Genital organs were not studied. These are lot of misidentifications of this species made and published by previous authors. All records of this species outside Java Island (locus typicus) to be considered doubtful, as type material was not studied by earier authors. I give the photographs of this species for the first time.

Sapintus (s. str.) ***bizonellus*** **(Marseul, 1882a)** (Plate 59 figs 9-10)

= *Anthicus bizonellus* Marseul, 1882b [duplicative description]

Syntype RMNH: Hekmeyer Ardjoeno Java or [handwritten] / bizonellus 111a [handwritten].

Remarks: Genital organs were not studied. I give the photographs of this species for the first time.

Sapintus (s. str.) ***botanicus*** **(Pic, 1952)** (Plate 60 figs 1-2)

Holotype MNHN: SAIGON [printed] 27. I. 49 [handwritten] J. BARBIER [printed] / v. botanicus mihi [handwritten].

Remarks: Refer to Telnov (2007c) for the information on nomenclature of this species. I give the photographs of this species for the first time.

Sapintus (s. str.) ***bryanti*** **(Pic, 1911)** [consider new combination above]

Material: 4 specimens NHRS, Ma-landa / Queensl *Mjöberg* / Riksmuseum Stockholm; 1 specimen NHRS: Mt. Tam-bourine / Queensl. *Mjöberg* / Riksmuseum Stockholm; 5 specimens DTC, AUSTR.NSW. Border Ranges N. Pk. Sheep-station Crk.cmpgrnd 375m 6-8.I. 1991 Pollock & Reichert / cantharidin; 2 specimens HMNH, AUSTRALIA, N.S.W. Carai State Forest Kookaburra, 943 m / 31°01'434"S 152°20'288"E 27-28. X. 2000 leg. A. Podlussány.

Remarks: Uhmann (2007: 68) already mentioned New South Wales' locality as 'NSW, Border Ranges, NP'. For some reason I give full locality data for it.

Sapintus (s. str.) ***carolinensis*** (Werner, 1965) (Plate 45 figs 3-4)

Paratype ♀ DCC: KUSAIE, Pukusrik 1 m. [printed] IV-2 [handwritten] –53 J.F.G. Clarke [printed] / Mangrove [handwritten] / light trap [printed] / PARATYPE Anthicus carolinensis Werner [printed] ♀ [handwritten] / PARATYPE [printed, label blue].

Remarks: I give the photographs of this species for the first time.

Sapintus (s. str.) ***cruciellus*** **(Marseul, 1882a)**

= *Anthicus cruciellus* Marseul, 1882b [duplicative description]

Holotype ♀ RMNH: Anthicus 928. bifasciatus cruciellus Java [handwritten] / Hekmeyer Ardjoeno Java or. [handwritten, label circular] / Holotype [printed, label red].

Remarks: This species is described from East Java and remains only known by the holotype (see also Telnov 2006). This species is generally very close to or even conspecific with widespread *S. gracilicornis* (Pic). The holotype of *S. cruciellus* is a female, so it remains impossible to compare the male genitalia of both taxa until the male specimens from the type locality of *S. cruciellus* are available. Antennomeres in *S. cruciellus* holotype are generally shorter than in the typical *S. gracilicornis*. On the other hand, *S. gracilicornis* is not yet confirmed from Java.

Sapintus (s. str.) ***curvatus*** **sp. nov.** (Figs 152-158, plate 60 figs 3-4)

Holotype ♂ NME: THAILAND, Phang-nga Prov., Takuapa distr., Khao Lak 08°37.623'N, 98°15.091'E, 50m 23.08.-02.09.2010, leg. A.Skale.

Paratypes 5 specimens: 2♂ & 1♀ NME, 1♂ DTC, same label as in holotype; 1♀ NME, S-THAILAND, ca 10km e. Khao Lak, 08°39'06"N, 098°17'22"E, Ton Chong Fah Waterfall leg. A. Skale, 03.08.2007.

Derivatio nominis: Named from the Latin 'curvatum' [curved], because of the modified male metatibiae.

Measurements, holotype ♂: Total body length 3.06 mm, maximum combined width across the middle of elytra 0.84 mm. Head 0.61 mm long, across the eyes 0.62 mm broad, pronotum 0.62 mm long, maximum width 0.50 mm, elytra 1.83 mm long, 0.84 mm broad. Measurements, para-

type ♀: Total body length 2.85 mm, maximum combined width across the middle of elytra 0.82 mm. Head 0.58 mm long, across the eyes 0.61 mm broad, pronotum 0.58 mm long, maximum width 0.48 mm, elytra 1.69 mm long, 0.82 mm broad.
Description: Dorsum dark orange, elytra with black markings in the form of a median transverse band (complete or narrowly interrupted on the suture, always bearing the lateral margins of the elytra) and a black apical spot. Legs, palpi and antennae yellow. Underside uniformly orange, trochanters yellow. Head smooth dorsally, with large and prominent eyes. Tempora slightly converged toward base, about a half of the length of the eye, with rounded temporal angles. Head base very broadly rounded, subtruncate. Punctures large and dense, but flat. Intervening spaces ranging from as large as the punctures to smaller than the punctures. Pu-

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Figures 152-158. *Sapintus curvatus* sp. nov. 152-156: Paratype ♂. 152 – Tergite VII; 153 – Sternite VII; 154 – Spiculum gastrale; 155 – Aedeagus; 156 – Tegmen of aedeagus. 157-158: Paratype ♀. 157 – Tergite VII; 158 – Sternite VII.

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bescence yellowish, fine and dense. Antennae long and slender, reaching far over the elytral humeri in the male. Second antennomere in male slightly shorter than third antennomere. Antennomeres 3-8 elongate and slender, slightly thickened distally. Antennomeres 9-10 somewhat shortened, 10th antennomere is the shortest among the antennomeres between 3 and 10. Terminal antennomere slightly asymmetrical, elongate, conical, slightly more than twice the length of the penultimate one in the male. Terminal maxillary palpomere somewhat axeform. Pronotum opaque dorsally, broadly rounded anteriorly, narrower than head, constricted postmedium toward base. Punctures larger than on the head, dense and coarse. Intervening spaces smaller or much smaller than punctures. Also, antero-lateral angles of pronotum densely punctate. Pubescence yellowish, long and dense, appressed. Scutellum rounded apically. Elytra strongly elongate, smooth dorsally. Punctures large, deep and dense, getting smaller postmedium. Intervening spaces vary in size, ranging from smaller than to about the same size of the punctures. Pubescence yellowish, long and dense, suberect, with several extraordinary long erect tactile setae on the sides and the disc. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward postbasal area. Legs long and slender. meso- and metatibiae in both sexes with 5-6 pairs of extraordinary erect setae on outer margin. Internal predistal margin of male metatibiae curved and with callus-like thickening. Basal tarsomere of both male and female metathoracic legs with a brush-like short and dense pubescence on underside, as long as the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male trapezoid, slightly excavated on apical margin (Fig. 152). Morphological sternite VII in male is short, broadly rounded on apical margin (Fig. 153). Aedeagus slender, with pointed and microdentate tegmen (Figs 155-156). Morphological tergite VII in female triangular, narrowly rounded on apical margin (Fig. 157). Morphological sternite VII in female short, broadly rounded on apical margin (Fig. 158).

Sexual dimorphism: Female metatibiae without modifications, only with extraordinarily long setae. Meso- and metathoracic legs setae comparatively shorter in the female than the male.

Variability: Specimens slightly vary in body length, from 2.70 mm to 3.06 mm.

Ecology & biology: No data available.

Differential diagnosis: This species is very specific due to modifications of the male metatibiae and the presence of 5-6 pairs of extraordinarily long setae on meso- and metatibiae in both sexes. Somewhat similar to *S. echinatus* sp. nov. (Indonesian Borneo), due to extraordinary setose meso- and metatibiae, but it clearly differs from it in that the male metatibiae are callus-like and thickened. Also similar to *S. bizonellus* (Marseul, 1882a) (Java) but this species specifically different in head shape and has simple male metatibiae.

Distribution: Only known from southern Thailand (Malay Peninsula).

Sapintus (s. str.) ***dybasi*** (Werner, 1965) (Plate 45 figs 7-8)

Paratype ♀ BMNH: Para-type [printed, label circular, border yellow] / KOROR I. Palau Islands 24Nov. 1947 [printed] / Pacific Sci.Board Ent.Surv.of Micronesia H.S.Dybas leg. [printed] / PARATYPE [printed] ♀ [handwritten] Anthicus dybasi Werner [printed] / PARATYPE [printed, label violet] / Brti.Mus. 1962-[printed] 619. [handwritten]

Remarks: I give the photographs of this species for the first time.

Sapintus (s. str.) ***echinatus* sp. nov.** (Figs 159-163, plate 60 figs 5-6)

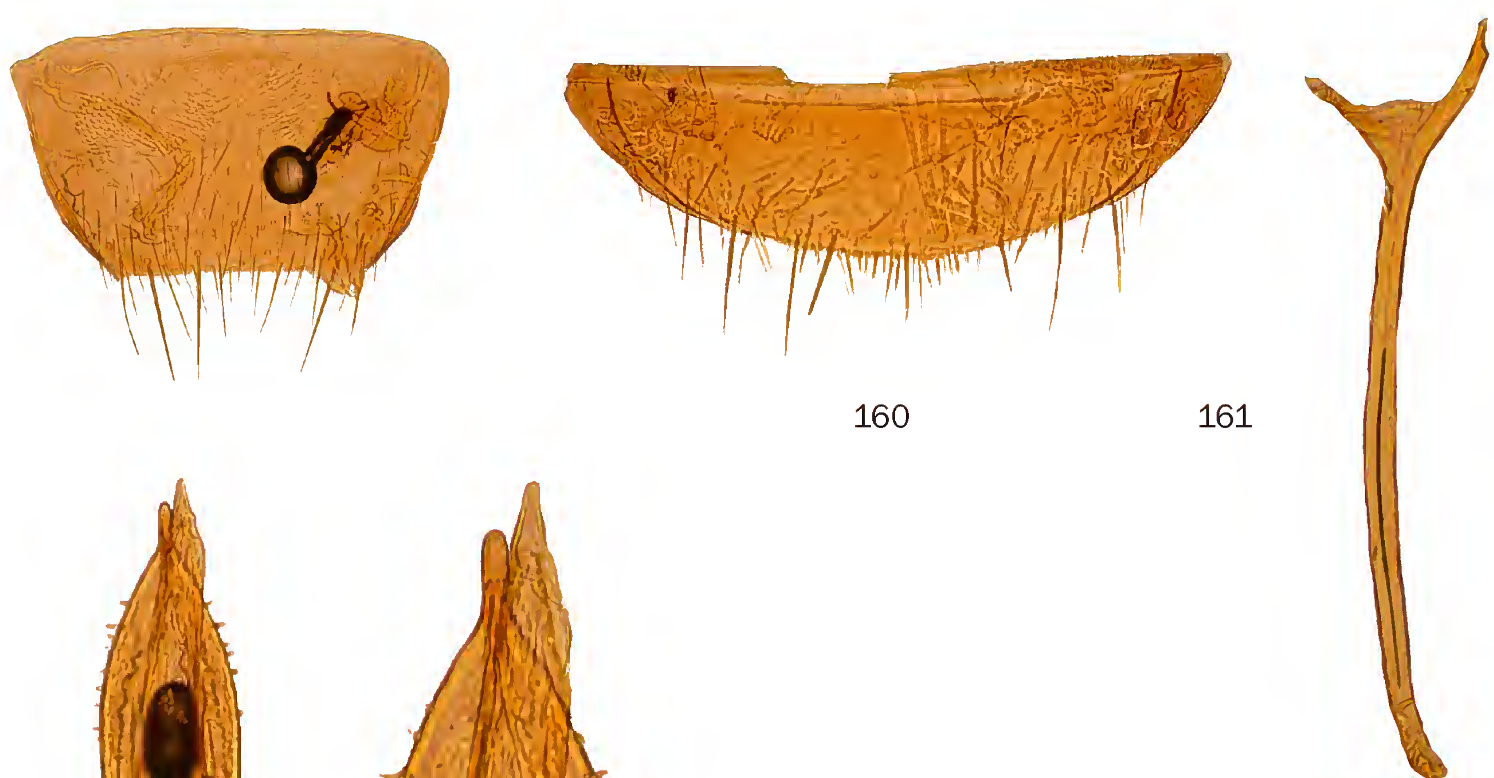
Holotype ♂ NME: **INDONESIA**, central Borneo, Prov. Kalimantan Barat, ~90 km E Putussibau N env., 0°53'N, 112°56'E, 07.I.2009, secondary rainforest, leg. A.Napolov.

Paratypes 16 specimens: 1 specimen BMNH, Borneo, Sabah Danum Valley 4°58'N: 117°47'E At Light June 1999 / BMNH{E} 2005-177 H. Mendel; 3 specimens NME, 4 specimens DTC, same label as in holotype; 2 specimens BMNH, INDONESIA: Borneo Kalimantan Tengah Busang / Rekut confl. 0°03'S, 113°59'E / August 2001 MV light Brendell / Mendel / 'Barito Ulu 2001' BMNH(E) 2001-191; 1 specimen BMNH, BORNEO, Sabah near Gum Gum Lower Kinabatangan June 2005, light trap / BMNH{E} 2005-178 H. Takano & T. Owen-Edmunds; 1 specimen MHUB, Borneo, Sabah Kinabatangan 22.VIII.2005, LF leg. Mey & Ebert; 1 specimen BMNH, BORNEO: Sabah, Danau Girang field stn. 24.vii.2008. W. Simondson / malaise trap. Secondary forest. Forest edge.; 1 specimen NME, 2 specimens DTC, **INDONESIA**, central Borneo, Prov. Kalimantan Barat, ~90 km E Putussibau N env., 0°53'N, 112°56'E, 10.I.2009, secondary rainforest, leg. A.Napolov.

Derivatio nominis: Named from the Latin 'echinatus' [bristly, spiny], because of the presence of extraordinarily long pronotal and elytral tactile setae and long setose tibiae.

Measurements, holotype ♂: Total body length 3.35 mm, maximum combined width across the middle of elytra 1.00 mm. Head 0.70 mm long, across the eyes 0.61 mm broad, pronotum 0.60 mm long, maximum width 0.49 mm, elytra 2.00 mm long, 1.00 mm broad. Measurements, paratype ♀: Total body length 3.34 mm, maximum combined width across the middle of elytra 1.01 mm. Head 0.70 mm long, across the eyes 0.67 mm broad, pronotum 0.64 mm long, maximum width 0.58 mm, elytra 1.95 mm long, 1.01 mm broad.

Description: Dorsum and venter orange to dark red, elytra with black markings. These black markings are variable in size and shape, consisting of a small humeral spot, a broad median transverse band (mostly not bearing the lateral margin of the elytra, interrupted on the suture or complete, posterior margin broadly excavated in the sutural area in case this band is complete), and a broad apical spot (extreme elytral apices are pale in most of the studied specimens). Antennae uniformly orange or dark orange. Legs yellow, in some paratypic specimens meso- and metatibiae orange. Underside orange- or reddish brown with yellow pro- and mesocoxae. Head smooth and shiny dorsally, with midsized prominent eyes. Tempora almost as long as the eye length, with rounded temporal angles. Head base broadly rounded. Punctures large but flat and sparse. Intervening spaces ranging from smaller than to twice as large as the punctures. Pubescence yellowish, long and dense. Antennae long and slender, reaching the postbasal impression of the elytra in the male. Second antennomere in male short, half the size of the third antennomere. Male antennomeres 4-10 elongate and evenly thickened; penultimate antennomeres not shorter and not thicker than preceding ones. Terminal antennomere elongate, bluntly conical, not or slightly longer than the penultimate one. Terminal maxillary palpomere somewhat axeform. Pronotum smooth and shiny dorsally, elongate, rounded anteriorly, significantly narrower than the head, with a feeble lateral prebasal transverse impression. Punctures large, dense and coarse, unevenly distributed, sometimes building continuous rows of 3-4 punctures almost without intervals. Intervening spaces vary in size, from much smaller to smaller than punctures. Pubescence yellowish, long, dense, appressed, with several extraordinary long erect tactile setae on the sides and on the disc. Scutellum



159 160 161 162 163

Figures 159-163. *Sapintus echinatus* sp. nov., paratype ♂. 159 – Tergite VII; 160 – Sternite VII; 161 – Spiculum gastrale; 162 – Aedeagus; 163 – Tegmen of aedeagus.

truncate apically. Elytra strongly elongate, smooth and shiny dorsally. Punctures very large, dense and coarse, getting much smaller and flat in the apical third (in some paratypic specimens punctures are as large and dense in the apical third, similar to the basal part of the elytra). Intervening spaces in basal half much smaller than punctures, the postmedium spaces ranging from as large as to larger than these. Pubescence yellowish, very long and dense, suberect. Numerous extraordinary long erect tactile setae on disc and sides (Plate 63 fig. 6). Undersetae directed obliquely laterally. Sutural striae complete, broad. Hind wings fully developed. Legs long and slender. Outer margin of all tibiae in both sexes with 6-7 pairs of extraordinarily long erect setae. Male protibiae with a weak thickening on median inner margin; distal part of inner margin densely setose. Male basal tarsomere of the metathoracic legs slightly longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male short, trapezoid, weakly excavated on apical margin and long setose (Fig. 159). Morphological sternite VII in male short and broad, broadly rounded on apical margin (Fig. 160). Aedeagus with tegmen pointed apically (Figs 162-163) and setose preapically on sides. Morphological tergite VII in female broadly rounded on apical margin.

Sexual dimorphism: Female antennomeres 4-7 comparatively shorter than in the male, more slender than female antennomeres 8-10. Female antennomere 10 shorter and slightly broader than antennomere 9. Female protibia not or very indistinctly thickened on inner margin.

Ecology & biology: Collected in secondary lowland rainforest, some of the specimens were attracted to light.

Differential diagnosis: This species is similar to several large and long setose Oriental and Wallacean species, for example *S. binhensis* (Pic, 1922) (Vietnam), *S. bizonellus* (Marseul, 1882a) (Java), *S. botanicus* (Pic, 1952) (Vietnam), *S. geminus* sp. nov. [described in this paper] (Sulawesi), *S. longehirsutus* (Pic, 1922) (Vietnam), *S. marseuli* (Pic, 1892) (widely distributed in East Asia), *S. trinotatipennis* (Pic, 1952) (Vietnam). *Sapintus echinatus* sp. nov. is specific primarily due to the presence of two rows of long setae on each tibia and by evenly elongate and thickened male antennomeres 4-10. *Sapintus trinotatipennis* also have similar male antennae, but the pronotum of this species is broader in anterior part and more strongly constricted toward the base; eyes are much larger and male protibiae are not thickened on the inner margin. In *S. binhensis* only antennomeres 7-9 are elongate, but not 4-6. Meso- and metatibiae bear very long setae in this species. *S. curvatus* sp. nov. (Southern Thailand) also have extraordinary setose meso- and metatibiae, but male metatibiae are callus-like and thickened predistally in this species. In *S. bizonellus* male antennomeres 4-10 not elongate nor thickened in this species.

Distribution: Known from West and Central Kalimantan (Indonesian Borneo).

Sapintus (s. str.) ***flavonotatus* (Pic, 1908)** (Figs 164-165, plate 61 figs 6-7)

= *Sapintus barbei* Bonadona, 1978 [consider new synonymy above]

= *Anthicus meritorius* Pic, 1914 [consider new synonymy above]

Holotype ♂ MNHN: Song Luong Blaise IX.02 [handwritten] / .... [text unreadable] / Anthicus Blaisei Pic in litteris [handwritten] / type [handwritten] / flavonotatus Pic type [handwritten].

Material: 1 specimen DTC, THAILAND occ.bor. 24.-28.04.1991 Chom Thong Jan Farkač leg.; 1 specimen DTC, S Vietnam, lam Dong pr., 120 NNE of Ho Chi Minh, Cat Tien National Park, 1-5.VII.1995; 2 specimens NHMB, 1 specimen DTC, LAOS:N-VIENTIANE Prov. Vang-Vieng, 300 m, N18°55'23" E102°26'55", 10-15.v. & 01-06.vi.2001, Jiří Kolibač leg.; 1 specimen DTC, Coll. I.R.Sc.N.B. CAMBODIA Siem Reap, Angkor Thom 26.V.2003 Light trap Leg. J. Constant, K. Smets & P. Grootaert; 2 specimens IRSN, Coll. I.R.Sc.N.B. CAMBODIA, 8Km North of Sre Noi (road to AnlongVaeng) Light trap-29-V-2003 Leg Constant&Smets.

Remarks: I give the photographs of this species for the first time.

Sapintus (s. str.) ***gracilentus* sp. nov.** (Figs 166-172, plate 60 figs 7-8)

Holotype ♂ NME: ВЬЕТНАМ горы NW Бай-туонг у Ланг-тянь 9.2.1963 г. Кабаков.

Paratype ♀ DTC: same label as in holotype.

Derivatio nominis: Named from the Latin 'gracilentus' [slender, elongate], because of the slender body.

Measurements, holotype ♂: Total body length 2.98 mm, maximum combined width across the middle of elytra 0.76 mm. Head 0.71 mm long, across the eyes 0.58 mm broad, pronotum 0.63 mm long, maximum width 0.47 mm, elytra 1.64 mm long, 0.76 mm broad. Measurements, paratype ♀: Total body length 3.13 mm, maximum combined width across the middle of elytra 0.94 mm. Head 0.71 mm long, across the eyes 0.59 mm broad, pronotum 0.67 mm long, maximum width 0.51 mm, elytra 1.75 mm long, 0.94 mm broad.

Description: Dorsum uniformly orange brown, each elytron with a very narrow median transverse black spot and a dark circular sutural spot in the preapical area. Legs, palpi and antennae yellowish. Underside uniformly orange brown, pro- and mesocoxae yellow. Paratypic specimen is teneral, generally pale yellow with very indistinct dark markings on the elytra. Head strongly elongate, smooth dorsally, with small, not prominent eyes. Tempora slightly converging toward base, about as long as the eye length, with rounded temporal angles. Head base rounded and feebly notched in the middle. Punctures fine and flat, larger near the eyes and on the frons, much sparser and smaller on the vertex. Intervening spaces about as large as the punctures on the frons, much larger than the punctures on the vertex. With a narrow and slightly convex median longitudinal impunctured line on the frons. Pubescence yellowish, fine and sparse. Antennae long and slender, in both sexes reaching the postbasal impression of the elytra. Second antennomere in male short, 1/2 the length of the third antennomere. Antennomeres 3-8 elongate and slender, of which 4-8 are thickened. Antennomeres 9-10 shorter than the preceding ones, thickened distally. Terminal antennomere elongate and blunt, two and a half times longer than the penultimate one. Terminal maxillary palpomere slightly axeform. Pronotum opaque dorsally, broadly rounded anteriorly, narrower than the head, strongly constricted postmedium toward base. Punctures large, dense and coarse, intervening spaces much smaller than the punctures. Also, antero-lateral angles of pronotum densely punctate. Pubescence yellowish, fine and long, appressed, with 4-5 very extraordinary long erect tactile setae on the sides. Scutellum truncate apically. Elytra strongly elongate and slender, smooth dorsally. Humeral angles not indicated. Punctures large and deep, irregularly dispersed, getting much finer and sparser postmedium. Intervening spaces vary in size, ranging from smaller than to three times larger than the punctures. Pubescence yellowish, long and sparse, suberect, with several extraordinarily long erect tactile setae on sides and disc. Undersetae directed obliquely laterally. Sutural striae broad, developed from apices toward postbasal impression. Hind wings completely atrophied in both sexes (wingless). Legs long and slender. Male basal tarsomere of the metathoracic legs longer than the combined length of the remaining metathoracic tarsomeres. Morphological tergite VII in male truncate on apical margin and covered with dense long setae (Fig. 166). Morphological sternite VII in male broadly rounded on apical margin and covered with dense setae (Fig. 167). Aedeagus tegmen long pubescent (Figs 169-170). Morphological tergite VII in female broadly rounded on apical margin and covered with dense long setae (Fig. 171). Morphological sternite VII in female broadly rounded on apical margin and covered with dense setae (Fig. 172).

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Figures 165-166. *Sapintus flavonotatus* (Pic, 1908), ♂ specimen from Sre Noi env., Cambodia. 164 – Aedeagus; 165 – Tegmen of aedeagus.

Sexual dimorphism: Antennomeres 4-7 are not thickened in the female like they are in the male. No data available.

Ecology & biology: No data available.

Differential diagnosis: This species is specific due to its slender body, unlike any other known member of the genus. Another important character unique among Oriental and Indo-Australian species is the absence of hind wings.

Distribution: This species is only known from Northern Vietnam.

Sapintus (s. str.) ***hartmanni* sp. nov.** (Figs 173-177 plate 52 fig. 7, plate 60 fig. 9)

Holotype ♂ NME: NEPAL, Prov. Bheri D: Banke, Nepalganj Hotel Kitchen Hut / 140m, NN, N28°04'97" E 81°38'56", on light 23.-25.VI.2011 leg.: M. Hartmann #02.

Derivatio nominis: Patronymic. Dedicated to the first collector, my good friend and respectful colleague, the director of the Naturkundemuseum in Erfurt (Germany), Mr. Matthias Hartmann.

Measurements, holotype ♂: Total body length 2.34 mm, maximum combined width across the middle of elytra 0.75 mm. Head 0.50 mm long, across the eyes 0.51 mm broad, pronotum 0.50


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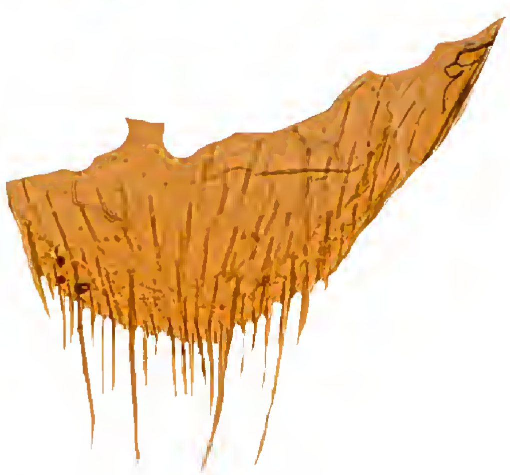
Figures 166-172. *Sapintus gracilentus* sp. nov. 166-170: Holotype ♂. 166 – Tergite VII; 167 – Sternite VII; 168 – Spiculum gastrale; 169 – Aedeagus; 170 – Tegmen of aedeagus. 171-172: Paratype ♀. 171 – Tergite VII; 172 – Sternite VII.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mm long, maximum width 0.49 mm, elytra 1.34 mm long, 0.75 mm broad.

Description: Forebody very dark red, base of pronotum somewhat paler. Elytra black or with large pale markings. These markings consist of a large postbasal yellow-to-orange spot (almost fused together on the suture, bearing the lateral margins of elytra) covering 1/3 of the elytra, and a smaller ovoid oblique preapical spot on each elytron. Antennomeres 2-4 pale, basal and 5th antennomere partly darkened, antennomeres 6-11 black, as is the palpi. Legs yellow. Underside reddish brown with a somewhat darker abdomen. This species is externally very similar to the widely distributed *Sapintus javanus* (Marseul, 1882a) (widely distributed in SE Asia) and *S. latioricollis* (Pic, 1929) (Laos, Vietnam) and can be differentiated by the following characteristics: Male aedeagus generally slender, tetradentate on each side (Figs 176-177) (tridentate in *S. javanus*, simple in *S. latioricollis*). Antennomeres 7-8 in male less elongate, more thickened. Morphological tergite VII in male broadly trapezoid, shallowly excavate on apical margin (Fig. 173). Morphological sternite VII in male very short, broadly rounded on apical margin (Fig. 174).

Sexual dimorphism: Female is unknown.

Ecology & biology: Attracted to light at an altitude of 140 m.

Distribution: This species is only known from south-western Nepal.

Sapintus (s. str.) ***lao* sp. nov.** (Figs 178-182, plate 62 figs 1-2)

Holotype ♂ NHMB, Laos:N-Vientiane Prov., Vang-Vieng, 300 m, N18°55'23" E102°26'55", 10-15.v. & 01-06.vi.2001, Jiří Kolibáč leg.

Paratypes 3 specimens: 1♂ DTC, same label as in the holotype; 1♂ NHMB, Laos: S-Udomxai Prov. Pak Beng, 450 m N 19°53'37", E 101°07'51" 18-27.v.2001 Jiří Kolibáč leg.; 1♂ NHMB, LAO,Phongsaly prov., 21°41-2'N 102°06-8'E, 28.v.-20.vi.2003, PHONGSALY env., ~1500m, Brancucci leg.

Derivatio nominis: Named after Laos, the country of origin of this species.

Measurements, holotype ♂: Total body length 3.12 mm, maximum combined width across the middle of elytra 0.92 mm. Head 0.62 mm long, across the eyes 0.59 mm broad, pronotum 0.60 mm long, maximum width 0.49 mm, elytra 1.90 mm long, 0.92 mm broad.

Description: Dorsum orange or pale orange, each elytron with dark humeri, dark median transverse band prolongated on anterior and broadly excavated on posterior margin, and with dark apical spot (leaving the very apex of elytra pale). Appendages yellow. Underside uniformly orange. Head smooth dorsally, with midsized prominent eyes. Tempora rounded in broad arc together with the base. Puncturation sparse, intervening spaces much larger than punctures. Pubescence yellowish, fine and long, sparse. The antennae long and slender, in male reaching over the anterior third of the elytra. The second antennomere in male 1/4 shorter than the third antennomere. Antennomeres 3-10 elongate and slender, of them 4-10 thickened and elongate-cylindrical. Antennomeres 9-10 slightly shorter than preceding. Terminal antennomere elongate pointed, only 1/5 longer than penultimate one. Terminal maxillary palpomere slightly axeform. Pronotum smooth dorsally, broadly rounded anteriorly, narrower than the head, constricted laterally postmedium. Puncturation large and coarse, intervening spaces (especially on the disc) smooth but much smaller than the punctures. Also anterolateral angles of pronotum are coarse punctate. Pubescence yellowish, fine and long, appressed, with some extraordinary long and erect tactile setae on sides and on the disc. Scutellum truncate apically. Elytra elongate, smooth dorsally. The humeral an-

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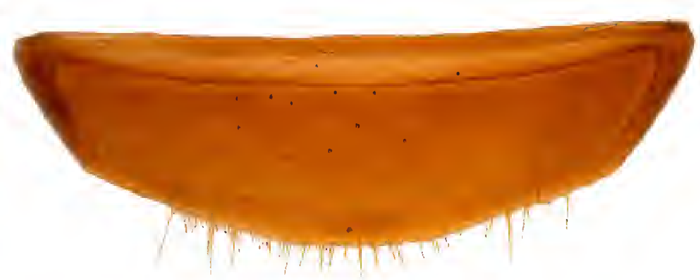

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Figures 173-177. *Sapintus hartmanni* sp. nov., holotype ♂. 173 – Tergite VII; 174 – Sternite VII; 175 – Spiculum gastrale; 176 – Aedeagus; 177 – Tegmen of aedeagus.

gles broadly rounded. Puncturation large and deep in the basal half (larger than on the pronotum), dispersed irregularly but arranged in a single row each side of the suture. Punctures getting much finer and sparser postmedium. Intervening spaces vary in size, smaller than (in basal half) to three times larger than punctures (in posterior half). Pubescence yellowish, very long and dense, suberect, with several extraordinary long erect tactile setae on sides and the disc. Undersetae directed more or less strongly obliquely laterally. Sutural striae broad, completely developed. Hind wings fully developed. Legs long and slender. Male basal tarsomere of the metathoracic legs as long as combined length of remaining metathoracic tarsomeres. Morphological tergite VII in the male truncate and shallowly excavated on apical margin, with few very long setae (Fig. 178). Morphological sternite VII in the male broadly rounded on apical margin (Fig. 179). Aedeagus with strongly prolongate tegmen apex (Fig. 181-182).

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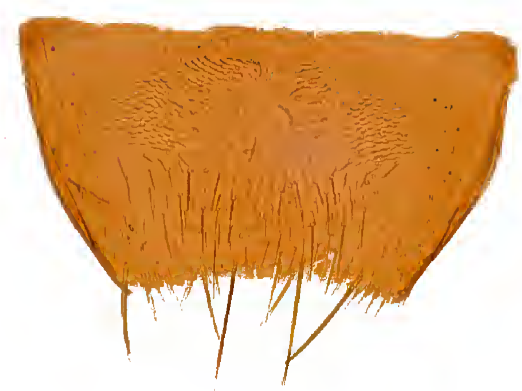
Sexual dimorphism: Female is unknown.
Ecology & biology: Collected at altitudes of 300 & 1500 m.
Differential diagnosis: This species is specific due to elongate and slightly thickened male antennomeres 4-10, as also because of generally slender body and specific elytral colouration. *S. pilipennis* (Pic, 1952) (Thailand, Vietnam) is quite similar in colour, but its body is less elongate and antennomeres 4-10 are simple, not modified. *S. anguliceps* (LaFerté-Sénectère, 1849) (widely distributed in tropical SE Asia) is also similar in colour pattern and dorsal puncturation, but differs in having simple, not modified antennomeres and in different shape of aedeagus.
Distribution: This species is only known from Laos.

Sapintus **(s. str.)** ***latioricollis*** **(Pic, 1929)** [consider new combination above]

Material: 2♂♂ DTC, S Vietnam, Lam Dong pr., 120 NNE of Ho Chi Minh, Cat Tien National Park, 5-6.VII.1995; 1 specimen NHMB, LAOS: S-UDOMXAI Prov. PAK BENG, 450 m N 19°53'37", E 101°07'5 18-27.v.2001 JIŘI KOLIBAČ leg.
Additional Vietnam records published by Telnov (1997, 1998) as *S. sodalis* (Pic).

Remarks: This species is very similar to *S. javanus* (Marseul, 1882a) and *S. hartmanni* sp. nov. (see new description above), but it differs in the simple, non-dentate male aedeagus.



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Figures 178-182. *Sapintus lao* sp. nov., paratype ♂. 178 – Sternite VII; 179 – Tergite VII; 180 – Spiculum gastrale; 181 – Aedeagus; 182 – Tegmen of aedeagus.

Sapintus (s. str.) ***marseuli* (Pic, 1892)** (Plate 62 figs 3-4)

= *Sapintus triparticornis* (Pic, 1926) [consider new synonymy above]

Material: 1 specimen DTC, Vietnam (Central), Thanh Hoa prov., Langchanh, 12.III.1963, leg. O.L.Kabakov; 1 specimen DTC, Vietnam N, Laichan prov., W Sapa, Binhen (500-600m), 28.V-2.VI.1963, leg. O.L.Kabakov.

Remarks: After careful examination of the type specimens of both taxa stored in MNHN, I came to the conclusion that *S. triparticornis* (originally described from Lac Tho, Central Vietnam, as *Anthicus* s. l., moved to *Sapintus* by Telnov (2007c: 34)) is conspecific with the widespread East Asian *S. marseuli* (known from Japan, the eastern parts of China, Taiwan, Thailand, Vietnam.) A record of this species from Nepal needs further confirmation.

Sapintus (s. str.) ***obscuricornis* (Broun, 1880)**

Material: 2 specimens BMNH, New Zealand. Ex Simson.; 4 specimens OUNH, Westport, N.Z. J.J.Walker Nov. 1901 / Anthicus obscuricornis Broun / ex. J. J. Walker bequest 1939; 2 specimens DTC, Westport, N.Z. J.J.Walker Nov. 1901 / ex. J. J. Walker bequest 1939; 2 specimens OUNH, Westport, N.Z. J.J.Walker Nov. 1901 / Anthicus anthracinus Broun; 2 specimens OUNH, Picton, N.Z. J.J.Walker Feb 1902 / ex. J. J. Walker bequest 1939; 2 specimens BMNH, New Zealand. / Sharp Coll. 1905-313.; 2 specimens BMNH, Mouri Creek / New Zealand. / Sharp Coll. 1905-313.

Sapintus (s. str.) ***pellucidipes* (Broun, 1880)**

Material: 1 specimen BMNH, New Zealand. ex. Simson. / 130 / G.C.Champion Coll. B.M.1927-409; 1 specimen OUNH, Wellington Dist. N.Z.N.Id G.V.Hudson / ex. J. J. Walker bequest 1939; 3 specimens OUNH, Waitakerei NZ 5/1902 JJWalker. / Anthicus pellucidipes Broun / ex. J. J. Walker bequest 1939; 1 specimen OUNH, Te Aroha NZ 5/1902 JJW. / ex. J. J. Walker bequest 1939; 1 specimen OUNH, Wellington, N.Z. J.J.Walker. Oct 1902 / Anthicus obscuricornis Broun; 2 specimens OUNH, 2 specimens DTC, Wellington NZ 10/1902 JJWalker / ex. J. J. Walker bequest 1939; 1 specimen BMNH, sedges / Matuka.Res: Bethals 29.x.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 3 specimens BMNH: debris by tidal Creek / AK:Bethells Beach.5.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimens BMNH, AK:Bethells Beach.5.xi.1983 / NEW ZEALAND B.M. 1984-80 / P.M.Hammond; 2 specimens BMNH, litter / AK: TUAKAU 9. xi. 1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimens BMNH, litter / AK:Waitakere Ra. Cascades Kauri PK. 6.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, in agarics / AK: Ahuroa forest reserve 15.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 5 specimens BMNH, 1 specimen DTC, wet litter by stream / AK: Ahuroa forest reserve 15.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen DTC: grass heaps / CL: Kopu 16.xi.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, Kauri forest litter / AK:Waitakere Ra. 30.xi.1983. Nt.Huia / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 2 specimens BMNH, litter / TK:Egmont N.P. Dawson Falls Rd. 550m. 6-7. xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 2 specimens BMNH, shore debris / TK: MANAIA Kaupokorui Beach 7.xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, litter / TK: Everett Pk. 8 km. ENE Inglewood 70m. 8.xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, TK: MOKAU VALLEY 8.xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, litter / WO:Hamilton Gudex's Bush 9.xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 2 specimens BMNH, litter / ND:Waipoua St.F. Waipoua Stm., 120m. 10-11. xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, streamside / AK:Waipoua St. F. Waipoua Stm. 120m. 10-12.xii.1983 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, Under log / AK:Wenderholm Scenic.Res.0-30m I.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimens BMNH, damp litter / AK:Wenderholm Scenic.Res.0-30m I.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimens BMNH, litter / AK:Wenderholm Scenic. Res.0-30m I.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimens BMNH, 1 specimen DTC, Debris by stream / WA:Ruakokoputuna Blue Rock Stm. 16.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, cut grass heaps / WN:LowerHutt garden debris 100m. 17.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 4 specimen BMNH, 1 specimen DTC, forest litter / WA:Tuhitarata Res. Lake Ferry 15m. 16.i.1984 / NEW ZEALAND B.M. 1984-80 P.M.Hammond; 1 specimen BMNH, WN:LowerHutt garden debris 100m. 17.i.1984 100m / NEW ZEALAND B.M. 1984-80 P.M.Hammond.

Sapintus (s. str.) ***pilipennis* (Pic, 1952)** (Figs 183-187, plate 62 fig. 5)

Material: 2 specimens DTC, Vietnam N, 160 km NNW Hanoi, Tuyen Quang prov., 3 km NE from Na Hang, Pac Ban vill. env., 900 m, primary rain forest, 11.VI.1996, leg. A. Napolov; 1 specimen DTC, Vietnam N, 160 km NNW Hanoi, Tuyen Quang prov., 3 km NE from Na Hang, Pac Ban vill. env., 900 m, primary rain forest, 12-14. VI.1996, leg. A. Napolov; 1 specimen DTC, SICHUAN, 4 JUL 1995 JINSHA RIV. VAL. JINJIAN, 1400 m BOLM lgt.; 2 specimens DTC, Vietnam - N, 180 km SSW Hanoi, 40 km SW Thanh Hoa, Ben En National Park, 50 m a.s.l., 23.VII-27.VIII.1998, leg. A.Napolov; 1 specimen NME, THAILAND,S,ca. 10km E Khao Lak,08°39'06"N 98°17'22"E,Ton Chong Fah Waterfall,03.VIII.2007 leg.A.Skale; 1 specimen NME, THAILAND Khao Lak, Hotel Similana, 2 km NE, geklopft U.Schmidt 8.-22.XI.2007.

Remarks: First records since original description. First records from Thailand and Yunnan (China). I give the photograph of this species for the first time.

Sapintus (s. str.) ***pollocki* Uhmann, 1999** (Plate 62 figs 6-7)

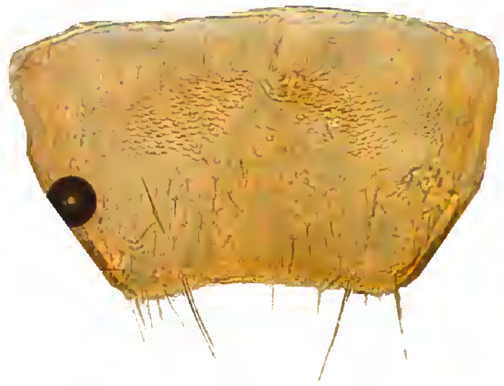
Material: 2 specimens HMNH, AUSTRALIA, 99.I.13. Queensland, Pinnocle village (camping) leg. A. Podlussány; 1 specimen DTC, AUSTRALIA, Queensland Tin Can Bay, 99.I.22. leg. A. Podlussány; 1 specimen HMNH, AUSTRALIA, NT, Mt. Bundey, 144 m, 13°13.5'S,131°8.0E, / 4-7. XI. 2000, leg. A. Podlussány, G. Hangay & I. Rozner.

Remarks: Consider potential synonymy with *S. insulanus* (Pic, 1900) as stated under 'Remarks' in description of *S. insulanus* above. I give the photographs of this species for the first time.

Sapintus (s. str.) ***rarus* (King, 1869)**

= *Sapintus deitzi* Werner, Chandler, 1995 [consider new synonymy above]

Remarks: *Sapintus rarus* have not yet been recorded from New Zealand, but synonymising *S. deitzi* with it adds New Zealand's North Island to the distribution area of this native Australian species. *S. deitzi* was described from the northern surroundings of Auckland (Parakai surroundings, collected by sweeping) and was known only from the locus typicus before. According to Thorpe (personal communication), 'this species is extremely common in the northern North Island of New Zealand (including Auckland), particularly during the cooler months of the year. It occurs in swards of long grass in wasteland areas, and not in natural environments. Sometimes it can reach densities of 20 or more individuals per square metre. This species seem to occur up on grasses ..., and rarely if ever on the ground, even when other anthicids ... are common on the ground under grass clippings in the same area. The grass habitat has been poorly investigated here,



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Figures 183-187. *Sapintus pilipennis* (Pic, 1952), ♂ specimen from Na Hang env., Northern Vietnam. 183 – Tergite VII; 184 – Sternite VII; 185 – Spiculum gastrale; 186 – Aedeagus; 187 – Tegmen of aedeagus.

which is why there are so few literature records'. *Sapintus rarus* is among species, possibly occasionally introduced to New Zealand from Australia, where it occurs in the eastern part of the continent, from Tasmania to Queensland (Telnov; unpublished data).

Sapintus (s. str.) ***siamensis* (Pic, 1914)** (Figs 188-192)

Material: 1 specimen DTC, S Vietnam, Lam Dong pr., 120 NNE of Ho Chi Minh, Cat Tien National Park, 12.VII.1995 / A. Napolov leg.; 1 specimen DTC, Vietnam – N, 180 km SSW Hanoi, 40 km SW Thanh Hoa, Ben En National Park, 50 m a.s.l., 23.VII-27.VIII.1998, leg. A.Napolov; 1 specimen NME, S-Thailand, ca. 8km s. Khao Lak, 08°36'36"N 098°14'61"E plantage, Umg. Merlin resort leg. A. Skale, 30.7. - 11.8.2007; 1 specimen PAC, #1 of 18.vi.12 Wong Tong Lantau. HK; 1 specimen PAC: 11 of 25.IX.12 Lam Tsuen valley H.K.; 1 specimen DTC, 1 specimen PAC, #30 of Sept 2011 Wong Tong Lantau. HK.

Remarks: First records from Hong Kong (and China).

Sapintus (s. str.) ***subopaciceps*** (Pic, 1913) (Figs 193-197, plate 62 figs 8-9) [consider revised status above]

Material: 1 specimen DTC, **INDONESIA**, central Borneo, Prov. Kalimantan Barat, ~90 km E Putussibau N env., 0°53'N, 112°56'E, 02-10.I.2009, secondary rainforest, leg. A.Napolov.

Remarks: I give the photographs of this species for the first time.

Sapintus (s. str.) ***testaceicolor*** (Pic, 1913) (Plate 63 figs 1-2)

Material: 1 specimen DTC, #22 of Apr 2011 Wang Tong Lantan. HK.

Remarks: First record since original description, first record from Hong Kong (and China). I give the photographs of this species for the first time.

Sapintus (s. str.) ***vietnamensis* sp. nov.** (Figs 198-204, plate 63 figs 3-4)

Holotype ♂ NME: VIETNAM N, 180 km SSW Ha Noi, 40 km SW Thanh Hoa, Ben En NP, 50 m, 23.VII-27.VIII.1997,

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Figures 188-192. *Sapintus siamensis* (Pic, 1914), ♂ specimen from Khao Lak env., Southern Thailand. 188 – Tergite VII; 189 – Sternite VII; 190 – Spiculum gastrale; 191 – Aedeagus; 192 – Tegmen of aedeagus.

secondary lowland forest, white light, leg. A.Napolov. Paratypes 13 specimens [10 DTC, 3 NME]: same label as in the holotype.

Derivatio nominis: Names after the country of origin, Vietnam.
Measurements, holotype ♂: Total body length 2.58 mm, maximum combined width across the middle of elytra 0.88 mm. Head 0.53 mm long, across the eyes 0.53 mm broad, pronotum 0.45 mm long, maximum width 0.48 mm, elytra 1.60 mm long, 0.88 mm broad. Measurements, paratype ♀: Total body length 2.56 mm, maximum combined width across the middle of elytra 0.87 mm. Head 0.53 mm long, across the eyes 0.53 mm broad, pronotum 0.47 mm long, maximum width 0.48 mm, elytra 1.56 mm long, 0.87 mm broad.
Description: Dorsum and venter uniformly dark black-brown, in some paratypic specimens elytra are brown, slightly paler than black forebody. Antennae brown with 2 basal antennomeres paler. Palpi brown. Legs brown to yellowish brown, paler than the rest of the body. Head opaque dorsally, with midsized, not very prominent eyes. Tempora almost as long as eye length, with broadly rounded temporal angles. Head base subtruncate. Punctures flat, crateriform, very dense and coarse, intervening spaces glabrous, much smaller than the punctures. Pubescence greyish, very fine and sparse. Antennae short, hardly reaching elytral humeri in both sexes. Second antennomere more or less as long as next one. Antennomeres 7-10 shortened and distinctly thickened, subcircular. Terminal antennomere asymmetric, bluntly conical, almost twice longer than penultimate one. Terminal maxillary palpomere broad, axeform. Pronotum opaque dorsally, broadly rounded anteriorly and the lateral margins distinctly constricted toward narrower base. Punctures like on the head but somewhat coarser, intervening spaces much smaller than


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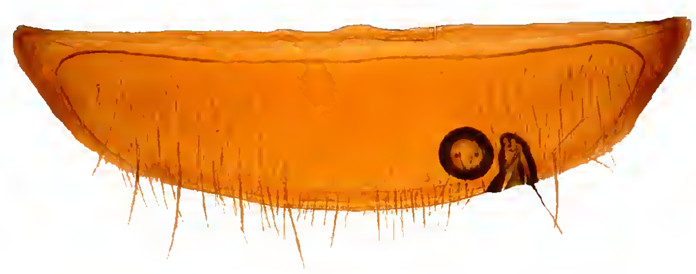
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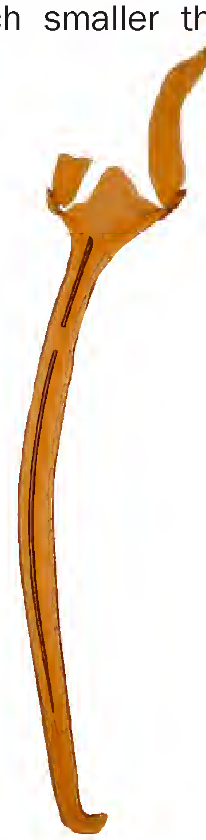
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Figures 193-197. *Sapintus subopaciceps* (Pic, 1913), ♂ specimen from Putussibau env., Indonesian Borneo. 193 – Tergite VII; 194 – Sternite VII; 195 – Spiculum gastrale; 196 – Aedeagus; 197 – Tegmen of aedeagus.

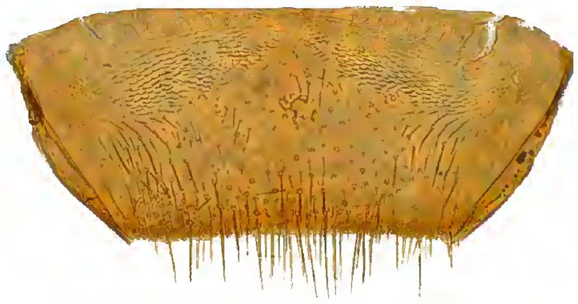
the punctures. Pubescence greyish, very fine, quite dense. Scutellum truncate apically. Elytra elongate, smooth and shiny. Punctures very large and dense in basal half, getting more flat preapically. Intervening spaces irregular, as large as or smaller than punctures. Pubescence yellowish, very fine, quite dense, suberect. Undersetae directed obliquely laterally. Sutural striae broad, developed from the middle toward apices. Hind wings fully developed. Legs slender. Male basal tarsomere of the metathoracic legs as long as combined length of remaining metathoracic tarsomeres. Claws long. Male morphological tergite VII truncate on apical margin (Fig. 198). Male morphological sternite VII short and broad, broadly rounded on apical margin (Fig. 199). Aedeagus with strong basal hooks, tegmen is strongly prolongated and pointed on apex (Figs 201-202). Female morphological tergite VII narrowly rounded on apical margin (Fig. 203). Female morphological sternite VII short and broad, broadly rounded on apical margin (Fig. 204).

Sexual dimorphism: Not indicated.

Ecology & biology: Collected at altitude of 50 m in secondary lowland rainforest, attracted to white light.

Differential diagnosis: This is a typical uniformly coloured *Sapintus*, which is primarily specific due to the shape of aedeagus in combination with opaque forebody and truncate male morphological tergite VII.

Distribution: This species only known from northern Vietnam.



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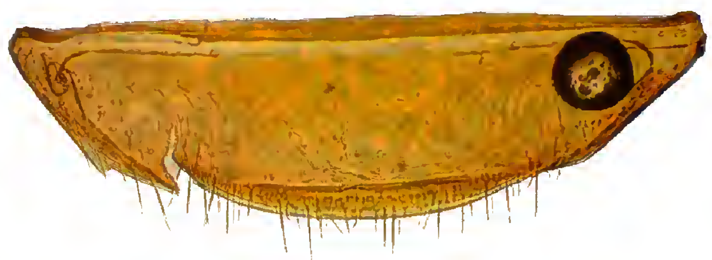

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Figures 198-204. *Sapintus vietnamensis* sp. nov. 198-202: Paratype ♂. 198 – Tergite VII; 199 – Sternite VII; 200 – Spiculum gastrale; 201 – Aedeagus; 202 – Tegmen of aedeagus & penis. 203-204: Paratype ♀. 203 – Tergite VII; 204 – Sternite VII.

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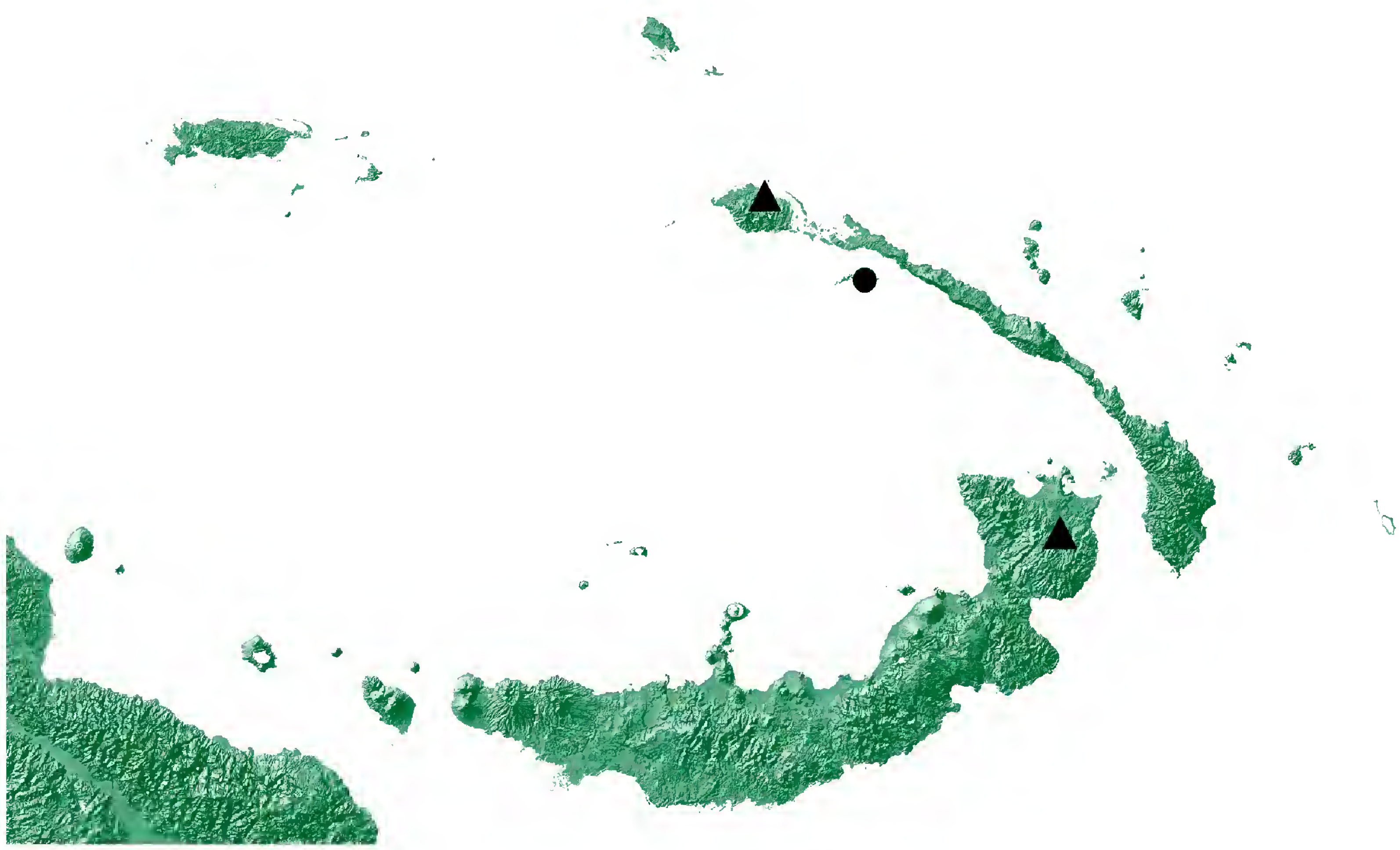
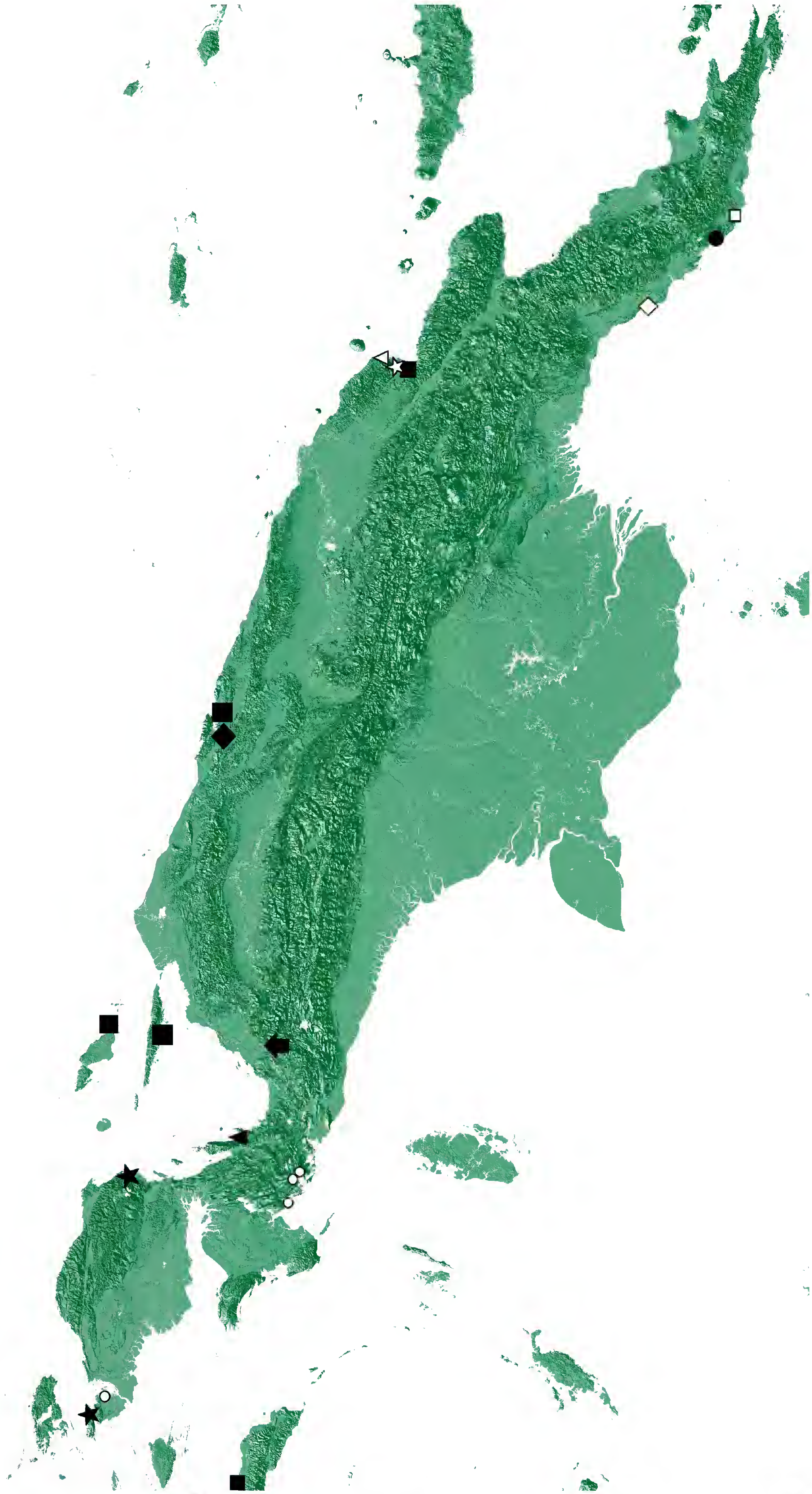


Map 2. Distribution of *Sapintus* species on Bismarck Archipelago. Filled circle – *S. dyaulensis* nom. nov. & *S. insularis* (Werner, 1965); filled triangle – *S. dilensis* (Pic, 1900) (prepared with Arc View 9.0).



Map 3. Distribution of *Sapintus* species on New Guinea. Filled circle – *S. alfurus* (Pic, 1900); circle – *S. celeripes* sp. nov.; filled triangle – *S. densepunctatus* sp. nov.; triangle – *S. geminus* sp. nov.; filled square – *S. horvathi* (Pic, 1902); square – *S. hirtipennis* (Pic, 1900), *S. loriae* (Pic, 1900), *S. papuus* (Pic, 1900) & *S. quadrinotatus* (Pic, 1900); filled rhomb – *S. javanus* (Marseul, 1882a); rhomb – *S. insulanus* (Pic, 1900); star – *S. madangensis* Uhmann, 1995; filled star – *S. sexualis* sp. nov.; filled arrow – *S. macrops* sp. nov. (prepared with Arc View 9.0).

Map 4. Distribution of *Sapintus* species on the Moluccas and Raja Ampat. Filled circle – *S. dilensis* (Pic, 1900); circle – *S. malut* sp. nov.; filled square – *S. horvathi* (Pic, 1902); square – *S. celeripes* sp. nov. & *S. oceanicus* (LaF., 1849a) (prepared with Arc View 9.0).

Map 5. Distribution of *Sapintus* species on Sulawesi. Filled circle – *S. gemitus* sp. nov.; circle – *S. monstrosiantennatus* sp. nov. & *S. malayensis* (Pic, 1895); filled square – *S. malayensis* (Pic, 1895) (prepared with Arc View 9.0).

Map 6. Distribution of *Sapintus* species on Solomon Islands. Circles (both filled & empty) – *S. airi* sp. nov.; empty circle – *S. curvitibia* sp. nov.; triangle – *S. oceanicus* (LaF., 1849a) (prepared with Arc View 9.0).

Taxonomic revision of the Cladonotinae (Orthoptera: Tetrigidae) from the islands of South-East Asia and from Australia, with general remarks to the classification and morphology of the Tetrigidae and descriptions of new genera and species from New Guinea and New Caledonia

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Abstract: A key for the identification of the subfamilies of Tetrigidae is revised. The South-East Asian genera and species of the Cladonotinae are taxonomically reviewed and a key is provided for the identification of the genera. A checklist is given for all genera, species and subspecies. Six new genera, *Boczkitettix* gen. nov., *Devriesetettix* gen. nov., *Ichikawatettix* gen. nov., *Ingrischitettix* gen. nov., *Planotettix* gen. nov., *Willemsetettix* gen. nov., and 36 new species, *Boczkitettix manokwariensis* sp. nov., *Cladonotella riedeli* sp. nov., *Dolatettix hochkirchi* sp. nov., *Dolatettix lehmanni* sp. nov., *Eurymorphopus bolivariensis* sp. nov., *Gestroana bayerriveriensis* sp. nov., *Gestroana cyclopensis* sp. nov., *Gestroana flasbarthi* sp. nov., *Gestroana gressitti* sp. nov., *Gestroana karimuiensis* sp. nov., *Gestroana kleukersi* sp. nov., *Gestroana moanemaniensis* sp. nov., *Gestroana morobensis* sp. nov., *Gestroana mounthagensis* sp. nov., *Gestroana pannosa* sp. nov., *Gestroana sedlaceki* sp. nov., *Gestroana willemsei* sp. nov., *Gestroana yapenensis* sp. nov., *Ichikawatettix detzeli* sp. nov., *Ichikawatettix kleinertae* sp. nov., *Ingrischitettix mountalbilalaensis* sp. nov., *Planotettix astrolabebayensis* sp. nov., *Planotettix biroi* sp. nov., *Planotettix buergersi* sp. nov., *Planotettix cyclopensis* sp. nov., *Planotettix fartmanni* sp. nov., *Planotettix karubakensis* sp. nov., *Planotettix maai* sp. nov., *Planotettix mountbaduriensis* sp. nov., *Planotettix planus* sp. nov., *Planotettix riedei* sp. nov., *Willemsetettix laeensis* sp. nov., *Willemsetettix maai* sp. nov., *Willemsetettix oriomoensis* sp. nov., *Willemsetettix wauensis* sp. nov., *Willemsetettix willemsei* sp. nov., are described. New combinations and revised status include *Boczkitettix borneensis* (Bolívar, 1887) comb. nov., *Devriesetettix dorreus* (Hancock, 1909) comb. nov., *Gestroana bicristulata* (Günther, 1938) comb. nov., *Holoarcus intermedius* (Willemse, 1932) comb. nov., *Holoarcus truncatus* (Hancock, 1909) comb. nov., *Ichikawatettix exsertus* (Günther, 1938) comb. nov., *Piezotettix sulcatus* (Bolívar, 1887) comb. nov. The following new synonyms are established: *Xistrella* Bolívar, 1909 = *Pseudogignotettix* Liang, 1990 syn. nov., *Cladonotella beccarii* (Bolívar, 1898) = *Cladonotella insulana* Willemse, 1961 syn. nov. One new name is proposed: *Holoarcus ferwillemsei* nom. nov.

Key words: Orthoptera, Tetrigidae, Cladonotinae, identification, New Guinea, New Caledonia, Australia, Philippines, Malaysia, Indonesia, taxonomy, revision, new genera, new species, new synonymy, new combinations, new name.

Introduction

There are about 1750 known species within the family of Tetrigidae. They can be located worldwide and populate almost all climatic zones from taiga to rainforest (deserts excluded). The only regional exception is New Zealand where species of Tetrigidae has yet not been found. Tetrigidae can be clearly identified by their pronotum, which typically extends far over the body. This feature is clearly unique and proves the allocation of the species without doubt.

This work examines the Tetrigidae of New Guinea and adjacent islands within the scope of a complete revision of South-East Asian genera of Cladonotinae. The bases for this paper are the works of Günther (1938a) and Blackith (1992). Günther examined the known genera of Cladonotinae except those of the Americas. Blackith later translated and slightly edited Günther's identification key.

A classification of the family of Tetrigidae into subfamilies is difficult and initially poses a big hurdle for the interested entomologist. This work is intended to be a start for better understanding of the subject matter with an identification key for all subfamilies and for the Cladonotinae of this particular region.

So far there are no references to the ecology for the examined species.

Material and methods

This research is based upon an analysis of considerable material of a variety of museums, displaying a multitude of relevant types; as well as, of course, the published literature. During a study trip in 2004 to Papua New Guinea, I was able to examine the fauna of Tetrigidae at different locations.

With the exception of gender and size, males and females of all reviewed species do not show dimorphism and are therefore not treated separately. Colouring may vary considerably within a species; it has however no consequence for diagnosis.

While determining the paratypes, I followed an individual numbering system (e.g. 3/14).

The following measurements are generally recorded:

Pronotum length: in dorsal view in midline from the anterior to the posterior margin (Plate 64 fig. 1).

Pronotum lobe width: in dorsal view the distance between the most extended margins of the ventral projections (Plate 64 fig. 2).

Pronotum height: in lateral view from the ventral margin of the lateral lobes vertical upwords to the dorsal margin of the pronotum (Plate 64 fig. 3).

Postfemur length: in lateral view the greatest length from the tip of the dorso-basal lobe to the end of the knee (Plate 64 fig. 4).

Postfemur width: in lateral view the greatest width (height) (Plate 64 fig. 5).

Tegmen length: in lateral view the length of the hardened part which is in situ visible beneath the pronotum (Plate 64 fig. 6).

Hind wing length: from the base of the visible part of the tegmen to the apex of the hind wing (Plate 64 fig. 7).

Vertex width: in dorsal view between the hind margins of the lateral carinae of the vertex and including the carinae (Plate 64 fig. 8).

Eye width: in dorsal view from just behind the hind margins of the lateral carinae outwards finding the longest diameter (Plate 64 fig. 9).

For most localities I identify the geographical coordinates as well as possible and mark them with square brackets.

Acronyms for scientific collections:

AMS – Australian Museum, Sydney, New South Wales, Australia;
ANIC – Australian National Insect Collection, CSIRO, Canberra City, Australian Capital Territory, Australia;
ANSP – Academy of Natural Sciences, Philadelphia, Pennsylvania, U.S.A.;
BMNH – The Natural History Museum, formerly British Museum (Natural History), London, United Kingdom;
BPBM – Bernice P. Bishop Museum, Honolulu, Hawaii, U.S.A.;
CDT – Collection Dmitry Telnov, Rīga, Latvia;
DORSA – Digitized Orthoptera Specimens Access, hold by the Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany;
HNHM – Hungarian Natural History Museum, Budapest, Hungary;
IRSNB – Institut Royal des Sciences Naturelles de Belgique, Bruxelles, Belgique;
LEMQ – Lyman Entomological Museum, McGill University, Quebec, Canada;
MBBJ – Museum Zoologicum Bogoriense, Bogor, Indonesia;
MCZ – Harvard University, Museum of Comparative Zoology, Cambridge, Massachusetts, U.S.A.;
MHNG – Muséum d'Histoire Naturelle, Geneva, Switzerland;
MNCN – Museo Nacional de Ciencias Naturales, Madrid, Spain;
MNHN – Muséum National d'Histoire Naturelle, Paris, France;
MNSL – Naturkundemuseum, Leipzig, Germany;
MSNG – Museo Civico di Storia Naturale "Giacomo Doria", Genova, Italy;
MZPW (Museum Stettin) – Polish Academy of Science, Museum of the Institute Zoology, Warszawa, Poland (here: Collection of the former Museum Stettin);
NCB-RMNH – Nederlands Centrum voor Biodiversiteit (Dutch Centre for Biodiversity, formerly Nationaal Natuurhistorisch Museum Naturalis), Leiden, he Netherlands;
NHME – Natuurhistorisch Museum, Maastricht, The Netherlands;
NHRS – Naturhistorisca Riksmuseet, Stockholm, Sweden;
NMW – Naturhistorisches Museum Wien, Austria;
NZSI – Zoological Survey of India, National Zoological Collection, Kolkata, India;
OUMNH – University Museum of Natural History, Oxford,

United Kingdom;
QM – Queensland Museum, South Brisbane, Queensland, Australia;
SMSM – Sarawak Museum, Kuching, Sarawak, Malaysia;
SMTD – Staatliches Museum für Tierkunde, Dresden, Germany;
UCDC – University of California, R.M. Bohart Museum of Entomology, Davis, California, U.S.A.;
UMB – Übersee-Museum, Bremen, Germany;
ZFMK – Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany;
ZIN – Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia;
ZMHU – Zoologisches Museum der Humboldt Universität, currently Museum für Naturkunde der Humboldt-Universität zu Berlin, Berlin, Germany;
ZSM – Zoologische Staatssammlung, Munich, Germany.

Morphology

Based on the work of Devriese (1999) I named all necessary morphological characters in the following figures.

Subfamilies

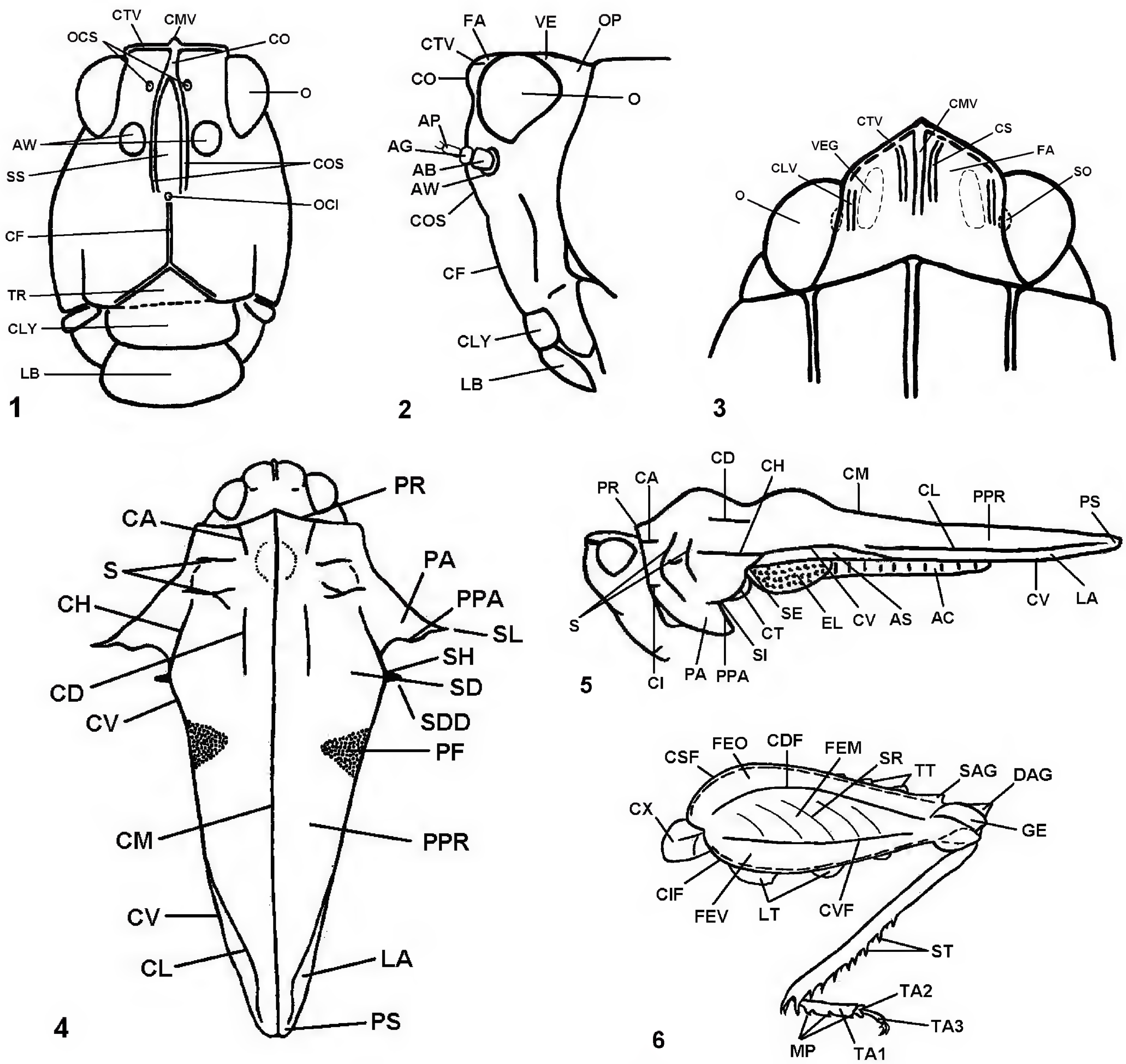
In his epochal work of 1887, Bolívar divided the family of Tetrigidae in 7 sections: Cleostratae, Cladonotae, Scelimenae, Metrodorae, Tettigiae, Batrachideae and Tripetalocerae. Hancock added the Discotettigiae and Bufonidae (1907), as well as the Lophotettigiae (1909) to the Sectiones. A division that despite of its' shortcomings is still in place today. Günther (1939) changed the until then used name Sectio Metrodorae to Sectio Amorphopi. Steinmann withdrew the older systematic categories such as sections and postulates 10 subfamilies instead: Cladonotinae, Scelimeninae, Metrodorinae, Tetriginae, Batrachinae in 1962; Lophotettiginae (1969) and Tripetalocerinae, Discotettiginae and Cleostratinae (1970a); Bufonidinae (1970b). Steinmann postulates the Tetriginae as a synonym of Tetricinae (1970b). Later authors, such as Otte, do not agree and Otte (1997) establishes 11 subfamilies inclusive of the Tetriginae, of which the subfamily of Cassitettiginae was later synonymized (Podgornaja, 2001). Otte does not list the Bufonidinae and falsely postulates the Amorphopinae based on Podgornaja (1986) with only two genera as a separate subfamily. But Podgornaja used 1992 in her identification key the name Metrodorinae for the Amorphopinae.

I use the name Metrodorinae (Type species: *Metrodora rana* Bolívar, 1887) for this subfamily until further revisions may establish a new system.

Podgornaja (1992) did not consider the subfamily of the Bufonidinae and Otte (1997) assigned them to the Tetriginae without providing a reason. I do not agree, since the morphology shows strong deviations. I allocate the Bufonidinae to the Cladonotinae due to their broadened scutellum. To postulate a separate subfamily of Bufonidinae would be inappropriate, because of the multitude of forms in these genera. If one were to establish such a separate subfamily, there would be many more subfamilies of genera with many different pronounced features. A later revision that does not follow the problematic feature of the broadened scutellum would very likely assign the genera differently. The largest number of the to-date described species are found within the Scelimeninae, Metrodorinae and Tettiginae. Allocations to these subfamilies are extremely difficult, since the characteristics used are not specific and very subtle. Discotettiginae (3 genera) and Lophotettiginae (2 genera) are based upon very rare attributes and encompass only few species. The same is valid for Cleostratinae (1 genus) and Tripetalocerinae (3 genera). The division in sections, or today's subfamilies, does in many cases not correspond with the true relationship, which Günther and other authors often remark in their works, and I agree with. Due to the lack of a complete revision however, Günther himself made use of the established allocations. Because of the described shortcomings, a complete revision of the subfamilies would be an important task. However, it poses enormous requirements on the researchers. For those who are studying, or wish to study the tetrigids, it is essential to identify the correct access point to the proper allocations of genera. This enables research of this family in greater depth.

The above explanations lead me to use the system of 9 subfamilies and their definitions:

Batrachideinae Bolívar, 1887
Cladonotinae Bolívar, 1887
Cleostratinae Hancock, 1907
Discotettiginae Hancock, 1907
Lophotettiginae Hancock, 1909
Metrodorinae Bolívar, 1887
Scelimeninae Hancock, 1907
Tetriginae Serville, 1838
Tripetalocerinae Bolívar, 1887



Figures 1-6. Morphological characteristics in Tetrigidae. 1 – Head, frontal view; 2 – Head, lateral view; 3 – Head, dorsal view; 4 – Pronotum, dorsal view; 5 – Pronotum, lateral view; 6 - Hind leg.

Abbreviations: AB – scapus, AC – visible part of hind wings, AG – flagellum, AP – pedicel, AS – infrascapular area, AW – antennal grooves, CA – prozonal carina, CD – interhumeral carina, CDF – dorso-external carina, CF – frontal carina, CH – humero-apical carina, CI – extralateral carina, CIF – ventral margin, CL – internal lateral carina, CLV – lateral carina, CLY – clypeus, CM – median carina, CMV – medial carina, CO – frontal costa, COS – fascial carinae, CS – secondary carina, CSF – dorsal margin CT – lateral shoulder carina, CTV – transverse carina, CV – external lateral carina, CVF – ventro-external carina, CX – coxa, DAG – genicular tooth, EL – tegmen, FA – fastigium, FEM – median external area, FEO – dorsal external area, FEV – ventral external area, GE – knee, LA – lateral area, LB – labrum, LT – lappets, MP – pulvilli, O – eye, OCI – medial ocellus, OCS – superior ocelli, OP – occiput, PA – lateral lobe, PF – posthumeral spot, PPA – posterior margin of lateral lobe, PPR – pronotal process, PR – anterior margin of pronotum, PS – apex, S – sulci, SAG – antegenicular tooth, SD – shoulder, SDD – tubercles of humeral angel, SE – tegminal sinus, SH – humeral angel, SI – ventral sinus, SL – spine of lateral lobe, SO – supraocular lobe, SR – transversal ridge, SS – scutellum, ST – tibia spines, TA1 – metatarsus, TA2 – second segment of tarsus, TA3 – third segment of tarsus, TR – clypeal triangle, TT – lappets, VE – vertex, VEG – fossula.

Key to the subfamilies of the Tetrigidae

The following identification key should enable an allocation to the subfamilies. It is based on the work of Podgornaja (1992).

1 Antennae filiform or thicker, exceptional the segments flattened (but see also in Metrodorinae: *Ophiotettix* and *Andriana*) 2
- All or 2-3 subapical segments considerable broadened and flattened 7
2 The medial ocellus between the eyes (one genus from the Philippines) .... Cleostratinae
- The medial ocellus below the lower margin of the eyes 3
3 Dorsal margin of the anterior and middle femora with a clear furrow .... Batrachideinae
- Dorsal margin of the anterior and middle femora with a well developed carina 4
4 Fascial carina of the frontal costa considerably widened. They enclose a broadened scutellum (broader than the scapus) .... Cladonotinae
- Fascial carina of the frontal costa diverge a little or runs parallel 5
5 The lateral lobes directed downwards and contiguous to the body, arched in different ways (not transverse truncated) .... Tetriginae
- The lateral lobes directed sidewards (in rare cases downwards) as an acute triangle process or an acute spine or a transverse truncated process 6
6 The lateral lobes directed sidewards as an acute triangle process or a long acute spine .... Scelimeninae
- The lateral lobes directed sidewards (in rare cases downwards) as a transverse truncated process .. Metrodorinae
7 Only 2 or 3 subapical segments considerably broadened and flattened or foliaceous .... Discotettiginae
- All antenna segments, with the exception of basal and apikal segments, clearly flattened 8
8 Antenna segments flattened triangularly. Head produced conical .... Tripetalocerinae
- Antenna segments flattend trapezoidal or rhomboidal. Head not produced (two genera from South America) .... Lophotettiginae

Key to the Cladonotinae of South East Asia and Australia

The following genera of Cladonotinae from the Asiatic mainland and other parts of the world were not considered in this key:

Acmophyllum Karsch, 1890 (Africa)
Afrolarcus Günther, 1979 (Africa)
Antillotettix Perez-Gelabert, 2003 (Caribbean)
Aspiditettix Liang, Chen, Li, Chen, 2009 (China)
Astyalus Rehn, 1939 (Africa)
Austrohancockia Günther, 1938 (Indochina, South China, Taiwan)
Bahorucotettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Bidentatettix Zheng, 1992 (China, India, Vietnam)
Choriphyllum Serville, 1838 (Caribbean)
Cladonotus Serville, 1838 (Sri Lanka)
Cladoramus Hancock, 1907 (Africa)
Cota Bolívar, 1887 (Southern America)
Cubanotettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Cubonotus Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Dasyleurotettix Rehn, 1904 (Africa)
Deltonotus Hancock, 1904 (South India, Sri Lanka, China, Vietnam)
Eleleus Bolívar, 1887 (South America)
Fieberiana Kirby, 1914 (East India)
Gibbotettix Zheng, 1992 (China)
Gignotettix Hancock, 1909 (Sri Lanka)
Haitianotettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Hancockella Uvarov, 1940 (South India)
Hippodes Karsch, 1890 (Africa)
Hottettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Microthymochares Devriese, 1991 (Madagascar)
Morphopoides Rehn, 1930 (Africa, Madagascar)
Morphopus Bolívar, 1905 (Africa)
Mucrotettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Oxyphyllum Hancock, 1909 (North India)
Pantelia Bolívar, 1887 (Africa)
Paulytettix Devriese, 1999 (Africa)
Pelusca Bolívar, 1912 (Africa)
Phyllotettix Hancock, 1902 (Caribbean)
Pseudepitettix Zheng, 1995 (China)
Pseudogignotettix Liang, 1990 (China)
Note: The 2 species are based upon the descriptions of larvae. On the drawings of the description plates

of *Pseudogignotettix emeiensis* Zheng, 1995 and *Pseudogignotettix guandongensis* Liang, 1990 the larval stages can be clearly recognized by the missing incision between the antegenicular teeth and the knee of the hind femur. Mr. Storozhenko (by letter) stated, that both species are possibly the last instar of *Xistrella* spec. and I agree with. Herewith I synonymize *Xistrella* Bolívar, 1909 with *Pseudogignotettix* Liang, 1990 **syn. nov.** The descriptions of both species are questionable and require further proof.

Royitettix Devriese, 1999 (Africa)
Sanjetettix Devriese, 1999 (Africa)
Seyidotettix Rehn, 1939 (Africa)
Sierratettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Tettilobus Hancock, 1909 (India, Sri Lanka)
Thymochares Rehn, 1930 (Madagascar)
Tiburonotus Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Trachytettix Stål, 1876 (Africa)
Truncotettix Perez-Gelabert, Hierro, Otte, 1998 (Caribbean)
Trypophyllum Karsch, 1890 (Africa)
Tuberfemurus Zheng, 1992 (China)
Typophyllum Karsch, 1890 (Africa)
Xerophyllum Fairmaire, 1846 (Africa)
Yunnantettix Zheng, 1995 (China)

The following identification key is based upon the key of Günther (1938a).

1 Pronotum with strongly raised median carina, usually with leaf-like compression; dorsal silhouette in profile never with sharp teeth or saw-edged in profile ... 2
- Pronotum never evenly compressed in a leaf-like pattern, median carina in profile not regularly elevated; or: compressed to the thickness of a leaf and produced over the head or with upward projecting processes in the anterior part of the pronotum ... 10
2 Organs of flight present ... 3
- Organs of flight absent ... 4
3 Antennae very long. Brachyptereous. Borneo ... *Paraphyllum* Hancock, 1913
- Antennae very short. Macroptereous. Borneo ... *Stegaceps* Hancock, 1913
4 The elevated foliaceous thin pronotum, seen in profile, with a distinct angle at the highest point of the dorsal line ... 5
- Pronotum with more or less evenly rounded or irregular dorsal silhouetette ... 7
5 The shield-like structure bordering the frontal carena pear-shaped or upright heart-shaped (drawn in Bolívar, 1887, fig. 2a) with the greatest breadth above the mid-point of its length. Highest elevation of the pronotum not exceeding the hind femora, above the mid-coxae. Philippines ... *Hymenotes* Westwood, 1837
- Frontal shield-like structure with the greatest breadth at or below the mid-length (drawn in Bolívar, 1887, fig. 3a; Plate 70, fig. 3) ... 6
6 Highest elevation of the pronotum often behind the hind coxae; the pronotum not exceeding the hind femora. Philippines ... *Hypsaeus* Bolívar, 1887
- Highest elevation of the pronotum before the mid coxae, sometimes even above the head; the pronotum slightly exceeding the hind femora. Philippines ... *Misythus* Stål, 1877 (partim)
7 Dorsal line of the pronotum, seen from above, forked, at least in the anterior half. New Guinea ... 8
- Dorsal line of the pronotum unforked or nearly unforked. Not from New Guinea ... 9
8 In lateral view a well visible frontal horn at the tip of the fastigium (Plate 71 fig. 7). New Guinea ... *Dolatettix* Hancock, 1907
- No frontal horn at the tip of the fastigium. New Guinea ... *Holoarcus* Hancock, 1909
9 Pronotum slightly exceeding the hind femora. Philippines ... *Misythus* Stål, 1877 (partim)
- Pronotum not exceeding the hind femora. Philippines ... *Piezotettix* Bolívar, 1887
10 External lateral carinae emarginated inside. Samoa, New Caledonia ... *Nesotettix* Holdhaus, 1908
- External lateral carinae not emarginated inside ... 11
11 Pronotum and body conspicuously flattened, hind femur more or less inclined with lateral curved lappets. New Guinea and New Caledonia ... 12
- Pronotum and body not conspicuously flattened ... 13
12 Micropronotal. Internal lateral carinae absent. New Guinea ... *Planotettix* gen. nov.
- Brachypronotal. Internal lateral carinae present. New Caledonia ... *Eurymorphopus* Hancock, 1907
13 Very long and macropronotal. Hind wings long ... *Gavialidium* Saussure, 1862

- Short and without long hind wings 14
14 Vertex, seen from above, at least produced in front of the eyes as an evenly broad, distinctly blunt, triangular, or rounded process with distinct transverse carinae. Prozonal carinae very short or almost absent. Vietnam, Borneo and New Guinea .... *Epitettix* Hancock, 1907
- Vertex, seen from above, not a blunt or clearly rounded process produced before the eyes. Lateral carinae short. Transverse carinae absent. Prozonal carinae especially for males long and elevated. Borneo, New Guinea 15
15 Pronotum with a more or less flat surface and one small exaltation of the median carina in line of the shoulders, but without bigger humps 16
- Pronotum not flat, at least in the anterior part often irregular, considerably humpy, or with one or more short, upper multi-peaked ridges on the median carina or with some considerable elevations 18
16 Head exserted over the pronotum, with globular projecting eyes. New Guinea .... *Ichikawatettix* gen. nov.
- Head not exserted. Eyes not conspicuously globular 17
17 Median carina does not reach the posterior margin of the pronotum. Australia .... *Tepperotettix* Rehn, 1952
- Median carina reaches the posterior margin of the pronotum. New Guinea .... *Devriesetettix* gen. nov.
18 Whole pronotum broadly rounded. Median carina nearly absent. New Guinea .... *Bufonides* Bolívar, 1898
- Pronotum not broadly rounded. Medial carina present 19
19 Pronotum, in lateral view, at least backwards to the middle flat or consistently higher rounded 20
- Pronotum at least in the posterior part irregular, considerably humpy, or with one or more shortened, multi peaked ridges on the median carina or with some considerable elevations 24
20 Apex of the anterior margin of the pronotum, seen from above, semicircular. Philippines .... *Diotarus* Stål, 1877
- Apex of the anterior margin of the pronotum, seen from above, consistently pointed cephalad 21
21 Lateral carinae running with a sharp corner to the medial carina. New Guinea .... *Ingrischitettix* gen. nov.
- Lateral carinae running parallel or slightly curved inwards to the medial carina 22
22 Fastigium, in lateral view, visible before the eyes but not projecting foreward. New Guinea ....
.... *Pseudohyboella* Günther, 1938
- Fastigium, in lateral view, projecting foreward 23
23 Small species, pronotum length < 6 mm. New Guinea .... *Willemsetettix* gen. nov
- Large species, pronotum length > 8mm. Borneo, New Guinea .... *Boczkitettix* gen. nov.
24 Anterior margin of the pronotum not or even less produced over the head 25
- The laterally compressed process of the leading edge of the pronotum considerably produced forward and above far beyond the head, in lateral view, irregulary formed. Philippines .... *Misythus* Stål, 1877 (partim)
25 Pronotum at the end, seen from above, acute (or acutely rounded). Anterior region of the pronotum irregularly raised, the posterior region irregularly rugose. Antennal segments very short and thick, at the most three times as long as broad. Borneo, Sumatra and India .... *Potua* Bolívar, 1887
- Pronotum at the end, seen from above, rounded, often bifurcated; mid-antennal segments usually strongly elongated 26
26 From Australia .... *Peraxelpa* Sjöstedt, 1931
- Not from Australia 27
27 Ventral margin of the infrascapular area strongly curved. Sulawesi .... *Tondanotettix* Willemse, 1928
- Ventral margin of the infrascapular area straight or a little curved 28
28 Antennae inserted less than half a diameter of an antennal groove below the lower margin of the eyes. Prozona. Java and New Guinea .... *Cladonotella* Hancock, 1909
- Antennae inserted more than one diameter of an antennal groove below the lower margin of the eyes. New Guinea .... *Gestroana* Berg, 1900

Descriptions

Boczkitettix gen. nov.

Type species: *Boczkitettix borneensis* (Bolívar, 1887) **comb. nov.**
Derivatio nominis: Patronymic. The genus is named after Robert Berthold Boczki, a famous German entomologist and a good friend.

Description: Important characteristics are: anterior border of the fastigium, in lateral view, broadly rounded and projected before the eyes. Scutellum broadened. Antennae inserted below the lower margin of the eyes. Pronotum tectiform with a low leaf-like part at the dorsal margin. Anterior process of the pronotum extending over the head; dorsal margin of the pronotum slowly descending posteriorly, with just a minimal concave area on each side of the median carina. Furcation of the dorsal line of the pronotum, seen from above, closed, only in the anterior part a very narrow furcation visible. Posterior process of the pronotum narrow and slightly rounded. Infrascapular area with a low concave part above the mid-femora. Brachypronotal. Flight organs absent. Last article of the tarsi conspicuously shorter than the first.

Differential diagnosis: The type species does not belong to *Dolatettix* Hancock, 1907. *Boczkitettix* gen. nov. does not have a well visible frontal horn on the tip of the fastigium. The pronotal crest is low and nearly tectiform but not foliaceous. The dorsal line of the pronotum is unforked or nearly unforked in *Boczkitettix* gen. nov. Even in *Holoarcus* Hancock, 1909 and *Piezotettix* Bolívar, 1887 the furcation of the dorsal line of the pronotum is well visible and the pronotum is conspicuously foliaceous. *Diotarus* Stål, 1877 is related to *Boczkitettix* gen. nov. but this genus has a broadly obtuse posterior apex of the pronotum. In *Boczkitettix* gen. nov. it is small and rounded. The new genus is very closely related to *Deltonotus* Hancock, 1904, but the species of *Deltonotus* Hancock, 1904 are micropronotal. The anterior apex of pronotum in frontal view in *Deltonotus* Hancock, 1904 is slightly broader than in *Boczkitettix* gen. nov. *Willemsetettix* gen. nov. is closely related to *Boczkitettix* gen. nov., but the species are smaller and the anterior apex of the pronotum is straight or extending slightly above the head (only *Willemsetettix laeensis*). In *Boczkitettix* gen. nov. the anterior apex of the pronotum is reaching the anterior border of the eyes or is extending over the head.

Distribution: Borneo and New Guinea.

Boczkitettix borneensis **(Günther, 1935) comb. nov.** (Plate 65 figs 1, 3, 5)

Dolatettix borneensis Günther, 1935 [description].

Holotype ♂ MBBJ, MALAYSIA: Borneo, H. C: Siebers.

Allotype ♀ SMTD, MALAYSIA: Borneo, Midden O. Borneo, 17.X.1925. H. C. Siebers.

Additional material: 1♀ NHME, MALAYSIA: N. Borneo, Bettotan, Nr. Sandakan, 3.VIII.1927.

Boczkitettix manokwariensis **sp. nov.** (Plate 65 figs 2, 4, 6-9)

Holotype ♀ BPBM, WEST PAPUA: Manokwari [0°52'S 134°05'E], 75 m, 19.VII.1957, leg. D. Elmo Hardy.

Paratypes ♂ (1/3) BPBM, WEST PAPUA: Manokwari [0°52'S 134°05'E], 75 m, 18.VII.1957, leg. D. Elmo Hardy, deposited in ZFMK; ♂ (2/3) BPBM, WEST PAPUA: Manokwari [0°52'S 134°05'E], 75 m, 21.VII.1957, leg. D. Elmo Hardy, deposited in NCB-RMNH; ♂ larva (3/3) BPBM, WEST PAPUA: Manokwari [0°52'S 134°05'E], 75 m, 24.VII.1957, leg. D. Elmo Hardy, deposited in BMNH.

Derivatio nominis: The species is named after the type locality.

Measurements, holotype ♀: Pronotum length 11.05 mm, pronotum lobe width 5.46 mm, pronotum height 3.9 mm, postfemur length 8.84 mm, postfemur width 3.45 mm, vertex width 1.26 mm, eye width 0.72 mm. Paratypes ♂♂: pronotum length 8-8.71 mm, pronotum lobe width 4.35 mm, pronotum height 2.85-3.15 mm, postfemur length 6.56-6.88 mm, postfemur width 2.9 mm, vertex width 0.98-1.02 mm, eye width 0.56-0.64 mm.

Description, holotype ♀: Head lower than the pronotum. Fastigium, in dorsal view, triangularly projecting before the eyes. Fossulae shallow. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved inwards, not reaching the medial carina. In lateral view visible before the eyes. Medial carina in the posterior part obsolete, initiated in line of the anterior margin of the eyes, arched and projected before the eyes. Frontal costa, in lateral view, visible before the whole eyes. Fascial carinae in lateral view slightly arched before the antenna. Scutellum, in frontal view, broader than an antennal groove. Furcation of the frontal costa above the superior ocelli, in a line of the middle of the eyes. Eyes, in dorsal view, drop-shaped, touching the anterior margin of the pronotum. Their dorsal margin lower than the fastigium. Antennae short. Upper margin of the antennal grooves in line with the lower margin of the eyes. Pronotum arched, rugose with some short carinulae and tubercles. Pronotum, in frontal view, tectiform. The anterior apex of the pronotum extending over the head until the frontal border of the eyes. Median carina extending to the anterior border. Prozonal carinae very short. Infrascapular area broad, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota curved laterally. In dorsal view, the lateral lobes angular with a very short and truncated posterior part. Pronotal process surpassing the middle of hind femora, seen from above, the posterior margin straight. The posterior apex of the pronotum flat. Between the external lateral carinae and the median carina concave. Tegmen and hind wings absent. Ventral margin of the anterior and middle femora slightly undulated, the dorsal margin straight. The ventral margin of the middle femora with some short hairs. The second segment of the tarsus short. Hind femora stout (2.5x longer

than wide). Genicular teeth and antegenicular teeth small. The dorsal margin of the hind femora finely serrated. Posttibia brown with two white bands. Last article of the tarsi conspicuously shorter than the first. Pulvilli short and obtuse. The third pulvilli shorter than the sum of the first and second. The male with the same characteristics but smaller.
Differential diagnosis: The anterior apex of the pronotum, in lateral view, of *Boczkitettix manokwariensis* does not reach the anterior margin of the head. The apex of *Boczkitettix borneensis* is extending over anterior margin of the head.
Distribution: Only known from the type locality from the north-east of New Guinea.

Bufonides Bolívar, 1898

Type species: *Bufonides antennatus* Bolívar, 1898.
Differential diagnosis: *Bufonides* Bolívar, 1898 is easily identified by the characteristically broadly rounded pronotum. The median carina is absent and the anterior border of the pronotum is extended in a horn above the head. The tegminal and ventral sinuses are absent. It is possibly related to *Diotarus* Stål, 1877 or *Misythus* Stål, 1877 (Günther 1934). Further research is required to determine the correct allocation.

Bufonides antennatus Bolívar, 1898 (Plate 66)

Lectotype ♂ MSNG, PAPUA NEW GUINEA: Nuova Guinea, [Western Prov.?], Fly River, 1876-77, leg. L. M. D'Albertis.
Paralectotypes 1♀ (1/3) MSNG, PAPUA NEW GUINEA: Nuova Guinea, [Western Prov.?], Fly River, 1876-77, leg. L. M. D'Albertis; 1♂ larva (2/3) MSNG, WEST PAPUA: Paumomu River, Loria, XI – XII.1892; 1♀ (3/3) MNCN, WEST PAPUA: Paumomu River, Loria, XI – XII.1892, no. 160.
The lectotype and the paralectotypes are designated for the first time.
Additional material: 13♀, 8♂, 1♀ larva, 1♂ larva BPBM, PAPUA NEW GUINEA: [Western Highlands Prov.], Fly River, Kiunga [6°07'S 141°18'E], 35 m, VIII.1969, leg. J. & M. Sedlacek.

Measurements lectotype ♂: Pronotum length 9.36 mm, pronotum lobe width 5.2 mm, pronotum height 3.77 mm, postfemur length 6.63 mm, postfemur width 2.86 mm, vertex width 0.72 mm, eye width 0.8 mm. Paralectotype 1/3 ♀: pronotum length 10.14 mm, pronotum lobe width 5.98 mm, pronotum height 4.81 mm, postfemur length 7.67 mm, postfemur width 3.38 mm, vertex width 0.88 mm, eye width 0.82 mm.
Descripion and differential diagnosis: see Hinton (1940).
Distribution: *Bufonides antennatus* is found in the south of New Guinea.
Note: I did not examine the specimens from Kokoda and from Mt. Tafa (leg. Cheesman) in BMNH but think that the specimens from Kokoda are the holotype and the paratypes of *Bufonides uvarovi* Hinton, 1940. I did not examine the ♂ from the Mamberamo River (Museum Buitenzorg) but think that Günther's (1936) identification is questionable because he was incorrect with the allocation of several specimens of *Bufonides antennatus*, *Bufonides sellatus* and *Bufonides uvarovi.* Both are only found in the south of New Guinea and not at the Mamberamo River in north-east of New Guinea.

Bufonides sellatus Hinton, 1940

Holotype ♀ BMNH, WEST GUINEA: Humbolt Bay Dist., Puksuam Dist., West of Tami River [Jayapura Area, Walckenaer Bay], 06.1937, leg. W. Stüber.
Paratype ♀ BMNH, WEST GUINEA: Humbolt Bay Dist., Puksuam Dist., West of Tami River [Jayapura Area, Walckenaer Bay], 06.1937, leg. W. Stüber.
Additional material: WEST PAPUA: 1♂, 1♀ BPBM, Geelvink Bay, Nabire [3°22'S 135°28'E], 1962, leg. Sedlacek/Gressitt; 1♀ ZSM, Cyclops-Mountains, Jayapura, Sentani [2°36'S 140°37'E], 300 m, 19.-21. IX.1990, leg. A. Riedel; 1♀, 1♀ larva BPBM, Cylcops Mountains, Ifar [2°34'S 140°31'E], 300-500 m, VI.1962, leg. Sedlacek/Gressitt; 1♀ NCB-RMNH, [Jayapura Area], Ampas, Bewani R.-territ. [3°30'S 140°50'E], 200 m, 1939, leg. W. Stüber; 1♀, 1♂ NCB-RMNH, Hollandia [Jayapura], VII.1938, leg. L. J. Toxopeus ; 2♂ BPBM, Bodem 11 km SE of Oberfaren [1°58'S 138°44'E], 100 m, 17.VII.1959, leg. T. C. Maa ; 1♂ BPBM, Genjam 40 km W of Hollandia [2°46'S 140°12'E], 100-200 m, 1.–10. III.1960, leg. T. C. Maa; 1♀, 1♂ NCB-RMNH, Bernhard Camp B [3°29'S 139°13'E], 100 m, 7. and 10.IV.1939, leg. L. J. Toxopeus ; 1♀ NCB-RMNH, Brunbeek, 17.V.1910, leg. P. v. Kampen.
PAPUA NEW GUINEA: 1♀ larva, 3♂ larvae SMTD, [West Sepik Prov.] Toricelli Gebirge, 600-780 m, leg. Schlaginhaufen (*Bufonides antennatus* det. Günther); 1♀ BPBM, [Western Prov.], Feramin [5°10'S 141°40'E], 1450 m, 29.VIII.1963, leg. R. Straatman; 1♀ larva UMB, [East Sepik Prov.], April River, Kupfer-Camp, 50 km SW Ambunti, 5.III.1973, leg. Hohmann; 1♀ BPBM, [East Sepik Prov.] Sepik District, Wewak [3°33'S 143°38'E], 300-500 m, 26.VI.1961, leg. J. L. & M. Gressitt; 1♀ BPBM, [East Sepik Prov.] Torricelli Mountains, Mobitei, 750 m, 16.–22.IV.1959, leg. W. W. Brandt; 1♀ OUMNH, [East Sepik Prov.], Lager am Lehmfluss (Nr. 327) [4°43'S 144°07'E], 12.V.1913,

leg. S. Bürgers; 1♀ ZMHU, [East Sepik Prov.], Hauptlager bei Malu (Nr. 242) [4°13'S 142°49'E], 19.I.1913, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 1♀ larva ZMHU, [East Sepik Prov.], Hauptlager bei Malu (Nr. 247) [4°13'S 142°49'E], 27.I.1913, leg. S. G. Bürgers; 2♀ ZMHU, [East Sepik Prov.], Hauptlager bei Malu (Nr. 248) [4°13'S 142°49'E], 28.I.1913, leg. S. G. Bürgers (1x *Bufonides antennatus* det. Günther); 1♀ ZMHU, [East Sepik Prov.], Hauptlager bei Malu (Nr. 308) [4°13'S 142°49'E], III.1913, leg. S. G. Bürgers (DORSA: BXbufantF04) (*Bufonides antennatus* det. Günther); 1♀ ZMHU, [East Sepik Prov.], Mäanderberg (Nr. 388) [4°07'S 141°40'E], 1.-10.VII.1913, leg. S. G. Bürgers; 1♀ ZMHU, [East Sepik Prov.], Mäanderberg (Nr. 396) [4°07'S 141°40'E], 10.-20.VII.1913, leg. S. G. Bürgers; 1♀ HNHM, [East Sepik Prov.], Mäanderberg (Nr. 396) [4°07'S 141°40'E], 10.-20.VII.1913, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 1♀ ZMHU, [East Sepik Prov.], Mäanderberg (Nr. 402) [4°07'S 141°40'E], 21.-30.VII.1913, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 2♀ ZMHU, [East Sepik Prov.], Lager am Rosensee (Nr. 259) [4°22'S 142°43'E], 10.II.1913, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 1♀, 1♂ ZMHU, [East Sepik Prov.], Quelllager (Nr. 128) [4°32'S 142°41'E], 13.-6. VIII.1912, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 2♂ ZMHU, [East Sepik Prov.], Standlager am Aprilfluss (Nr. 200) [4°32'S 142°29'E], 29. - 30.X.1912, leg. S. G. Bürgers (*Bufonides antennatus* det. Günther); 2♀ larvae ZMHU, 1♂ larva SMTD, [East Sepik Prov.], Regenberg (Nr. 330) [4°32'S 142°29'E], 550 m, 8.-15.V.1913, leg. S. G. Bürgers (DORSA: ♂= BXbufantM01; *Bufonides antennatus* det. Günther); 1♂ ZMHU, [East Sepik Prov.], Kaiserin Augusta Flussexpedition (Nr.112), leg. S. G. Bürgers (*Bufonides antennatus* det. Günther).

Description and differential diagnosis: See Hinton (1940).
Distribution: Found in the north of New Guinea from Nabire in the west to the upper Sepik River system in the east.

Bufonides uvarovi Hinton, 1940

Holotype ♂ BMNH, PAPUA NEW GUINEA: [Cenral Prov.], Kokoda [8°39'S 147°15'E], 1200 ft., VI.1933 (leg. L. E. Cheesman).
Paratypes 5♀, 6♂ BMNH, PAPUA NEW GUINEA: [Cenral Prov.], Kokoda [8°39'S 147°15'E], 1200 ft., IV., V., VIII, IX, X.1933 (leg. L. E. Cheesman). All specimens have the label "*Bufonides antennatus* Bol., K. Gunther det." (Hinton, 1940).
Additional material: PAPUA NEW GUINEA: 1♀, 1♂ SMTD, [Central Prov.], Kokoda [8°39'S 147°15'E], 1200 ft. IX.1933, leg. L. E. Cheesman (*Bufonides antennatus* det. Günther); 1♀ larva BPBM, [Central Prov.], Kokoda [8°39'S 147°15'E], 400 m. 22.III.1956, leg. J. L. Gressitt; 1♀ BPBM, [Morobe Prov.], Morobe Dist., Wau (M.V. Light Trap) [7°20' 146°43'], 1200 m, 29.-30.IX.1963, leg. J. Sedlacek; 1♀, 1♀ larva, 1♂ larva BPBM, [Northern Prov.], Kokoda-Pitoki [8°55'S 147°44'E], 450 m, 23. + 24.III.1956, leg. J. L. Gressitt; 1♀ UMB, [Northern Prov.], Lejo, 15 km WNW Popondetta, 25.V.1973, leg. Hohmann; 1♂ AMS, [Northern Prov.], Mt. Lamington District, VII.1927, leg. C. T. McNamara; 1♀ ANIC, [Northern Prov.], N. Distr., Managalese area, ca. 2500-3000 ft., VIII.1964, leg. R. Pullen; 1♀ ANIC, [Northern Prov.], N. Distr., Mai-u R., SW of Wanigela, VII.1972, leg. R. Pullen; 1♂ ANIC, [Northern Prov.], Popondetta [8°46'S 148°14'E], III.1961, leg. A. Catley; 1♀ ANIC, [Northern Prov.], Popondetta [8°46'S 148°14'E], 22.I.1962, leg. A. Catley; 4♀, 2♂ BPBM, [Northern Prov.], Popondetta (Light Trap) [8°46'S 148°14'E], 25 m, VI.1966, leg. Shanahan-Lippert.

Description and differential diagnosis: see Hinton (1940).
Distribution: Found only in the east of Papua New Guinea.

Cladonotella Hancock, 1909

Type species: *Cladonotella gibbosa* (Haan, 1842).
The genus was established by Hancock, to include two species formerly attributed to the genus *Cladonotus* Saussure, 1862 by Bolívar: *Cladonotella gibbosum* (Haan, 1842) and *Cladonotella beccarii* (Bolívar, 1898). Günther (1938a) designates *Cladonotella gibbosa* (Haan, 1842) as the genotype. The types have been lost.
Description: The plump and wingless species of the genus *Cladonotella* Hancock, 1909 have a high elevated and swollen pronotum between the shoulders. The lateral lobes curved strongly lateraly. They are rounded or acute but do not have as a long spine as *Tettilobus*. The genicular and antegenicular teeth are relatively large. The lateral faces of the hind femora are covered with humps (in *Cladonotella beccarii* (Bolívar, 1898) only one). The dorsal and ventral margin of the anterior and middle femora with two lappets at least (in *Cladonotella beccarii* (Bolívar, 1898) only one on the ventral margin).
Differential diagnosis: Very closely related to *Gestrona* but the species of *Cladonotella* Hancock, 1909 are more plump, the prozonal carinae have a greater distance, wider than the distance between the supraocular lobes. *Cladonotella* Hancock, 1909 has a heart-shaped or nearly heart-shaped

elevation on the pronotum and in the posterior third of the pronotum no lengthwise elevation. *Gestroana* Berg, 1900 never has a heart-shaped elevation on the pronotum. The pronotum has a compressed high and spinous elevation up to the posterior third or a bimodal pronotum: in the anterior part bigger and in the posterior part smaller at least minimally compressed elevation lengthwise. *Cladonotella* Hancock, 1909 is also closely related to *Potua* Bolívar, 1887. The antennae of *Potua* Bolívar, 1887 are in comparison to *Cladonotella* Hancock, 1909 distinctly short. *Potua coronata* Bolívar, 1887 has no conical rounded humps on the outside of the hind femora, but the bands on the outside are thick. The ventral margin of the anterior femora only with one lappet. *Potua coronata* Bolívar, 1887 is covered densely with short hairs, *Cladonotella* Hancock, 1909 is not. *Austrohancockia* Günther, 1938 is also related to *Cladonotella* Hancock, 1909. But in this genus the pronotum is not only elevated but broadened laterally.
Distribution: Java and New Guinea.

***Cladonotella beccarii* (Bolívar, 1898)** (Plate 67 figs 1, 3, 5)
Cladonotella insulana Willemse, 1961 **syn. nov.** (Plate 67 figs 2, 4, 6)
Cladonotella beccarii: Holotype ♀ MSNG, WEST PAPUA: Ramoi [NW Doberai Pen., Lowland], II.1875, leg. O. Beccari.
Additional material: 1♀ ZSM, WEST PAPUA: Manokwari, Gn. Meja, ca. 300 m, 23.-24.IX.1990, leg. A. Riedel; 2♀ OUMNH, NEW GUINEA, leg. Wallace.

Measurements, holotype ♀: Pronotum length 8.71 mm, pronotum lobe width 5.59 mm, pronotum height 4.68 mm, postfemur length 5.72 mm, postfemur width 2.73 mm, vertex width 1.3 mm, eye width 0.48 mm. ♀ ZSM: pronotum length 9.52 mm, pronotum lobe width 5.92 mm, pronotum height 4.9 mm, postfemur length 5.76 mm, postfemur width 2.72 mm, vertex width 1.4 mm, eye width 0.49 mm.

Cladonotella insulana: Holotype ♂ NCB-RMNH, WEST PAPUA: Waigeo, 3.VIII.1948, leg. M. A. Lieftinck.
Paratype ♀ NCB-RMNH, WEST PAPUA: Waigeo, 3.VIII.1948, leg. M. A. Lieftinck.
Willemse designates the holotype and the allotype from a series of three specimens. I did not find the types in NCB-RMNH but I located the third specimen (♂) with the same data as the types.
Additional material: 1♂ NCB-RMNH, WEST PAPUA: Waigeo, 3.VIII.1948, leg. M. A. Lieftinck.

Differential diagnosis: I have had the opportunity to examine the holotype of *Cladonotella beccarii* (Bolívar, 1898) from Genova. Willemse did not see this specimen but he gives a redescription of the genus. The description of Willemse (1961), his pictures, and the examination of the third specimen with the same data as the types shows clearly in all characteristics that *Cladonotella insulana* Willemse, 1961 is a synonym of *Cladonotella beccarii* (Bolívar, 1898). In his work Willemse (1961) gives two drawings of a specimen of *Cladonotella beccarii* (Bolívar, 1898). He was incorrect. It is a new species from West Papua (Rattan Camp): see *Gestroana willemsei* sp. nov.
Distribution: Only found on Waigeo.

***Cladonotella gibbosa* (Haan, 1842)** (Plate 68 figs 1-6)
Holotype ♂ NCB-RMNH, INDONESIA: Japonia, leg. von Siebold.
It is not "Japonia" but Java (Günther 1938a). The type is lost and I did not find him at NCB-RMNH.
Additional material: 1♂ ANSP, INDONESIA: Java, C. Besser, VIII.1940, leg. R. F. Sternitsky; 1♀ SMTD, INDONESIA: Java, Soekaboemi, leg. Overdijkink (*Potua coronata* det. Günther); 1♀ SMTD, INDONESIA: Java, G. Pantjar, 500 m, 11.-14.12.1913, leg. M. A. Lieftinck (*Potua coronata* det. Günther).

Measurements ♀ SMTD (G. Pantjar): Pronotum length 9.39 mm, pronotum lobe width 5.44 mm, pronotum height 3.95 mm, postfemur length 5.6 mm, postfemur width 2.4 mm, vertex width 1.15 mm, eye width 0.45 mm. ♂ ANIC: pronotum length 9.1 mm, pronotum lobe width 5.46 mm, pronotum height 4.16 mm, postfemur length 6.11 mm, postfemur width 2.6 mm, vertex width 1.1 mm, eye width 0.52 mm.
Distribution: Java.

***Cladonotella interrupta* (Bolívar, 1898)** (Plate 68 figs 7-9)
Holotype ♀, MSNG: INDONESIA: Giava [Java], Tcibodas, X.1874, leg. O. Beccari.
Additional material: 2♂, NCB-RMNH: INDONESIA: Java. 1♀, SMTD: INDONESIA: Java.

Measurements, holotype ♀: Pronotum length 7.67 mm, pronotum lobe width 4.68 mm, pronotum height 2.86 mm, postfemur length 4.81 mm, postfemur width 1.95 mm, vertex width 0.9 mm, eye width 0.44 mm. ♂♂ NCB-RMNH: pronotum length 6.56-7.04 mm, pronotum lobe width 4.5-4.75 mm, pronotum height 2.17-2.25 mm, postfemur length

4.5-4.9 mm, postfemur width 2.05 mm, vertex width 0.9 mm, eye width 0.43 mm.
Distribution: Java.

***Cladonotella riedeli* sp. nov.** (Plate 69 figs 1, 3, 5)
Holotype ♀, ZSM, WEST PAPUA: Jayawijaya-Prov., Samboka, upper Kolff River, ca. 200 m, 10.-14.X.1996, leg. A. Riedel.

Derivatio nominis: Patronymic. The species is named after the collector Dr. Alexander Riedel.
Measurements: Pronotum length 10.67 mm, pronotum lobe width 7.12 mm, pronotum height 6.24 mm, postfemur length 6.64 mm, postfemur width 2.8 mm, vertex width 1.54 mm, eye width 0.61 mm.
Description: Unique species with a high elevation of the pronotum and long spines on the outside of the hind femora. Head lower than the pronotum. Fastigium not reaching the frontal margin of the eyes. Visible part of the vertex short, with shallow fossulae. Anterior border of the fastigium straight. Transverse carinae obsolete. Lateral carinae very short, only like a short horn in line of the middle of the eyes. Vertex broad, 2.5x broader than an eye. Median carina or dorsal end of the frontal costa like a small horn, in lateral view, visible above the eyes. Frontal costa, in lateral view, visible in all parts before the eyes but not arched. Fascial carinae strongly arched before the antennae. Frontal costa in frontal view broad. Furcation of the frontal costa above the superior ocelli, in line of the middle of the eyes. Superior ocelli above the lower margin of the eyes. Eyes subcircular. Their dorsal margin below the fastigium, almost touching the anterior margin of the pronotum. Upper margin of the antennal grooves in line with the lower margin of the eyes. Antennae longer (about 4 mm), their flagellum with 15 articles, no. 13 white and no. 14 light brownish. Pronotum a little shorter than the body, irregular with a high broad elevation in the anterior half. Elevation of the pronotum in frontal view strongly broadened upwards to the humeral angle. A second elevation, in lateral view, above the middle of the infrascapular area. Between the elevations a deep sulcation. The whole pronotum rugose, coverd with smaller and larger spines. Anterior border of the pronotum straight. Median carina visible in all parts. The anterior margin forming a little horn. Pronzonal carinae short and straight. Their distance (1.8 mm) longer than the vertex width. Humeral angeles angular. Interhumeral carinae absent. Infrascapular area broad and with two light parts, reaching the end of the pronotum. Ventral sinus and internal lateral carinae absent. Lateral lobes slightly curved laterally, the apex acute and the posterior margin truncate. Pronotal process not reaching the knees, seen from above, the apex curved deeply concave. Flight organs absent. Anterior and middle femora slender, the dorsal and ventral margin and the outside with lobes and spines. Middle femora without hairs. Second segment of the tarsus short. Hind femora swollen and stout (2.4x longer than wide). The dorsal and median external area with long spines. The dorsal margin with one lobe. Hind tibia brown with a light antegenicular band. Antegenicular teeth long and acute. Genicular teeth large and broader than the antegenicular teeth. Last article of the tarsi nearly as long as the first. First and second pulvilli short and spinose, the third pulvilli as long as the sum of the first and second.
Differential diagnosis: Easy to identify by the special elevation of the pronotum and the long spines on the outside of the hind femora.
Distribution: Only found in one location at the upper Kolff River.

Key to species of *Cladonotella* Hancock, 1909

1 Elevation of the pronotum in frontal view strongly broadened upwards to the humeral angels .... *Cladonotella riedeli* sp. nov.
- Elevation of the pronotum in frontal view not or only slightly broadened upwards to the humeral angles 2
2 Medial carina, in lateral view, visible before the eyes as a frontal horn 3
- Medial carina, in lateral view, not visible before the eyes .... *Cladonotella interrupta* (Bolívar, 1898)
3 Lobes on the dorsal margin of the hind femur rounded; pronotal process with humps. West Papua .... *Cladonotella beccarii* (Bolívar, 1898)
- Lobes on the dorsal margin of the hind femur acute; pronotal process with bands. Java .... *Cladonotella gibbosa* (Haan, 1842)

***Devriesetettix* gen. nov.**
Type species: *Devriesetettix dorreus* (Hancock, 1909) **comb. nov.**

Derivatio nominis: Patronymic. The genus is named after Henrik Devriese, a famous Belgian orthopterologist and scientist in the Tetrigidae.
Description: Eyes not exserted above the fastigium and the pronotum. Vertex 2x broader than an eye, slightly broadened from the supraocular lobes to the frontal margin. Anterior border of the fastigium straight. Lateral carinae, in frontal view, going downwards and reaching the medial carina/frontal costa. Broadened scutellum. Antennae inserted under the lower margin of the eyes. Infrascapular area narrow. Posterior margin of the pronotum broadly rounded. Flight organs absent. Hind femur slender.
Differential diagnosis: The type species *Devriesetettix dorreus* was originally described as *Mazarredia dorrea*. Günther (1938a) added this species to *Tondanotettix* Willemse, 1928. The type species of this genus is *Tondanotettix brevis* (Haan, 1842) from Tondano (Sulawesi) and deposited in Leiden (NCB-RMNH), where I examined the holotype and took pictures (plate 69 figs 2, 4, 6). I agree with Günther (1938a), that this species does not belong to *Mazarredia* with the type species *Mazarredia gemella* (Bolívar, 1887). But it does not belong to *Tondanotettix* Willemse, 1928 either. It is possibly closely related to *Devriesetettix* gen. nov. It is different in that by the lateral carinae (they curved back and does not reach the medial carina in *Tondanotettix* Willemse, 1928), the slender hind femora, the rounded apex of the pronotum and especially the infrascapular area. In *Tondanotettix* Willemse, 1928 the ventral margin of the infrascapular area is conspicuously concave, in *Devriesetettix* gen. nov. it is straight. *Devriesetettix* gen. nov. is related to *Tepperotettix* Rehn, 1952 from Australia, but it differs by the prozonal carinae. In *Tepperotettix* Rehn, 1952 they are curved outwards to the back. The fastigium of *Tepperotettix* Rehn, 1952 is tapering to the frontal margin and the posterior apex of the pronotum is furcated.
Distribution: Only known by the holotype of *Devriesetettix dorreus* from West Papua, Dorey.

***Devriesetettix dorreus* (Hancock, 1909) comb. nov.** (Plate 69 figs 2, 4, 6)
Mazarredia dorrea Hancock, 1909 [description].
Tondanotettix dorreus (Hancock, 1909) [Günther (1938a): new combination].
Holotype ♀, OUMNH, WEST PAPUA: Dorey, leg. Wallace.

Measurements ♀: pronotum length 6.63 mm, pronotum lobe width 4.0 mm, pronotum height 2.4 mm, postfemur length 5.68 mm, postfemur width 2.0 mm, vertex width 0.94 mm, eye width 0.42 mm (I examined the holotype).
Description, diagnosis and distribution: See above under *Devriesetettix* gen. nov.

***Diotarus* Stål, 1877**
Type species: *Diotarus verrucifer* Stål, 1877.
Diagnosis: The genus *Diotarus* Stål, 1877 can be easily identified by the tectiform pronotum and the anterior margin of the pronotum. It is, seen from above, extending above the head. The apex is semicircular. This genus needs to be revised by examining further material from the Philippines and of the type material. Günther (1938a) provides a good intoduction to the four known species
Distribution: Found only on the Philippines.

***Diotarus galeatus* Bolívar, 1887**
Lectotype ♀ MNMS, PHILLIPINES: Norzagaray Bulusan, leg. Mazarredo.
Paralectotype ♀ MNMS (?), PHILIPPINES: Montes de Angat, leg. Maeso (after Bolívar, 1887).
I have not examined any of type specimens.

***Diotarus ikonnikovi* Bey-Bienko, 1935** (Plate 70 figs 1, 3, 5)
Holotype ♂ ZIN, PHILLIPINES: Los Banos, leg. N. Ikonnikov.
I have not examined the holotype.
Paratype ♂ NHME, PHILLIPINES: Los Banos, 15.V.1917, leg. N. Ikonnikov.

***Diotarus pupus* Bolívar, 1887**
Syntypes ♀ & ♂ MNMS, PHILLIPINES: Luzon, Camarines sur, leg. Mazarredo.
I have not examined any of type specimens.

***Diotarus verrucifer* Stål, 1877** (Plate 70 figs 2, 4, 6)
Holotype ♂ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12932).

***Dolatettix* Hancock, 1907**
Type species: *Dolatettix spinifrons* Hancock, 1907.
Diagnosis: *Dolatettix* Hancock, 1907 is closely related to *Holoarcus* Hancock, 1909. Both genera are the only ones from New Guinea with a pronotum formed as a foliaceous pronotal crest. *Dolatettix*

Hancock, 1907 is distinguished from *Holoarcus* Hancock, 1909, in lateral view, by a very well visible frontal horn (plate 71 fig. 7). The three species of *Dolatettix* Hancock, 1907 are, in comparison to the *Holoarcus*-species with a pronotum length of minimal 15 mm, small or very small. The pronotum length of the *Dolatettix* species is under 12 mm.
Distribution: Three species found in the north and west of Papua New Guinea.

***Dolatettix hochkirchi* sp. nov.** (Plate 71 figs 2, 4, 6, 8)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [East Sepik Prov.], Wewak [3°33'S 143°38'E], 2-20 m, 13.X.1957, leg. J. L. Gressitt.

Paratypes 1♀, 1♂ BPBM, PAPUA NEW GUINEA: [East Sepik Prov.], Amok [3°35'S 142°57'E], 165 m, 6.I.1960, leg. T. C. Maa, 1♀ (2/2) deposited in ZFMK.

Derivatio nominis: Patronymic. The species is named after Dr. Axel Hochkirch, a famous German orthopterologist.
Measurements holotype ♀: Pronotum length 7.15 mm, pronotum lobe width 3.9 mm, pronotum height 5.07 mm, postfemur length 6.11 mm, postfemur width 2.6 mm, vertex width 0.96 mm, eye width 0.52 mm. Paratype 1/2 ♀: pronotum length 7.12 mm, pronotum lobe width 3.51 mm, pronotum height 4.25 mm, postfemur length 5.05 mm, postfemur width 2.35 mm, vertex width 1 mm, eye width 0.5 mm. Paratype 2/2 ♂: pronotum length 6.37 mm, pronotum lobe width 3.51 mm, pronotum height 4.25 mm, postfemur length 5.05 mm, postfemur width 2.35 mm, vertex width 0.9 mm, eye width 0.5 mm.
Description: Very small, brachypronotal and wingless species with a foliaceous pronotal crest. Head lower than the pronotum. Fastigium not projecting before the eyes, only the frontal horn of median carina is at eye-level. Anterior border of the fastigium rounded. Vertex convex with one concave part near the eyes and a second near the medial carina, much broader than an eye. Transverse carinae obsolete. Lateral carinae short. Medial carina not elevated. Fossulae shallow. Frontal costa, in lateral view, extended in a frontal horn at the tip of the fastigium, ventrad slightly projected before the eyes. Fascial carinae in lateral view, arched before the antenna. Scutellum in frontal view very broad, much broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little under the middle of the eyes. Superior ocelli in line of the lower third of the eyes. Eyes suboval, touching the anterior margin of the pronotum. Their dorsal margin much below the fastigium. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Antennae with 14 segments. Pronotum tectiform with a foliaceous pronotal crest, the margin (median carina), in lateral view, arcuate and smooth, in dorsal view very narrow (♀♀ 0.08 + 0.1 mm, ♂ 0.1 mm) with a inconspicuous depression. Anterior border of the pronotum extending over the head. Pronotum rugose, covered with impressed dots and some small carinulae and longer strips at the pronotal process. Prozonal carinae very short and straight, little elevated. Humeral angles and interhumeral carinae absent. Infrascapular area broad with a concave part above the beginning of the middle femora. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, not contiguous to the body. Pronotal process short, not reaching the knees of the hind femora, seen from above, broadly truncated with a convex central part. Tegmen and hind wings absent. Anterior and middle femora medium broad. The anterior femora with two ventral lappets. The middle femora with undulating borders, dorsal with one small lappet and some short hairs. The second segment of the tarsus short. Hind femora rather stout (2.3x longer than wide). The dorso- and ventro-external carina without tubercles. The ventro-external carina in dorsal view with an arch. Genicular teeth medium sized. Antegenicular teeth relatively large, larger than Genicular teeth. 2 small sawteeth on the dorsal margin before the antegenicular teeth. The posttibia dark brown with two white bands, the lower one inconspicuous. Pulvilli acute. Oviscapt elongated. Colour brownish with white and black parts on the pronotal crest. A larger black spot above the middle of the infrascapula area. Pronotum, head and legs covered with brownish organic material.
Sexual dimorphism: The male differs only by the smaller size and form of the pronotal process with a short triangularly excised apex from the female.
Differential diagnosis: The new species is clearly recognised as a species of the genus *Dolatettix* Hancock, 1907 by the frontal horn on the fastigium. It differs from *Dolatettix spinifrons* Hancock, 1907 by the arcuate and smooth pronotal crest and shortness.
Distribution: Only found on the northcoast of Papua New Guinea in the area of Wewak.

***Dolatettix lehmanni* sp. nov.** (Plate 71 figs 3, 5)

Holotype ♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.] Regenberg [4°52'S 144°07'E], 8.-15.V.1913, Kaiserin-Augusta-Flussexpedition Nr. 338, leg. Bürgers

Derivatio nominis: Patronymic. The species is named after Dr. Arne Lehmann, a famous German orthopterologist.
Measurements holotype ♀: Pronotum length 8.19 mm, pronotum lobe width 3.9 mm, pronotum height 5.07 mm, postfemur length 6.11 mm, postfemur width 2.6 mm, vertex width 0.96 mm, eye width 0.52 mm.
Description: Small, wingless species with a foliaceous pronotal crest. Head lower than pronotum. It matches *Dolatettix hochkirchi* sp. nov. in all morphological details but is a little larger. *Dolatettix lehmanni* sp. nov. has no black spot on the pronotal process above the infrascapular area. The width of dorsal margin of the pronotal crest is 0.45 mm.
Differential diagnosis: The new species is clearly recognised as a species of the genus *Dolatettix* Hancock, 1907 by the frontal horn on the fastigium. It differs from *Dolatettix spinifrons* Hancock, 1907 by the arcuate and smooth pronotal crest and shortness. It is very similar to *Dolatettix hochkirchi* sp. nov. but differs by the 4-5x broader margin of the pronotal crest and the absence of a black spot above the infrascapular area. *Dolatettix lehmanni* sp. nov. is a little larger than *Dolatettix hochkirchi* sp. nov.
Distribution: Only found in one location in the south of the Sepik system.
Note: The specimen was incorrectly identified by Günther as *Dolatettix spinifrons* Hancock, 1907.

***Dolatettix spinifrons* Hancock, 1907** (Plate 71 figs 1, 7)
Holotype ♀ ANSP, PAPUA NEW GUINEA: [Central Prov.], Moroka [9°25'S 147°41 E], 2000 ft, 1891, leg. Anthony.
Additional material: 1♀ UMB, PAPUA NEW GUINEA: [Northern Prov.], Popondetta, Lejo Station, 12 km W Popondetta, 12.V.1973, leg. Hohmann.

Measurements ♀ UMB: Pronotum length 11.44 mm, pronotum lobe width 4.08 mm, pronotum height 6.3 mm, postfemur length 7.2 mm, postfemur width 3.12 mm, vertex width 1.06 mm, eye width 0.6 mm. The dorsal margin of the pronotum is nearly straight and not as undulated as the holotype. In comparision with the Holotype the fascial carinae are more projected before the antenna. There is more research required to determine whether this is a new species or not.
Note: I did not have access to the following specimen from Günther (1938b): 1♀ BMNH: Kokoda, 400 m, IX.1933, leg. L.E. Cheesman.

***Epitettix* Hancock, 1907**
Type species: *Epitettix punctatus* Hancock, 1907.
Distribution: Madagascar (locality needs confirmation), India, Vietnam, Indonesia, New Guinea.

***Epitettix dammermanni* Günther, 1939**
Holotype ♀ SMTD, INDONESIA: [Java], Idjen, Blawan, 950 m, 7.VI.1924, leg. Dammerman.

Distribution: Java.

***Epitettix elytratus* Günther, 1939**
Holotype ♀ NZSI, INDIA: Darjeeling Distr., Kalimpong, 200-1500 m, 1.IV-31.V.1915, leg. Gravely.

Distribution: Only found at the type locality in India.

***Epitettix emarginatus* (Haan, 1842)** (Plate 72, figs 1-4, 7-8)
Holotype ♀ NCB-RMNH, NEW GUINEA: N. Guinea.
I found the Holotype at NCB-RMNH and labelled it. The specimen has a typical round label given by the author Haan.
Additional material: 1♂ BPBM, WEST PAPUA: Vogelkop, Bomberi, sweeping, 700-900 m, 6.+7.VI.1959, leg. T. C. Maa; 1♂ BPBM, WEST PAPUA: Vogelkop, S.coast of Bomberai, Fak Fak [2°55'S 132°18'E], 10–100 m, 11.VI.1959, leg. T. C. Maa.
Note: It is somewhat uncertain whether these two males are in fact *Epitettix emarginatus* since they are a smaller. Further research is required.

Distribution: Found in the west of West Papua.

***Epitettix fatigans* Günther, 1938**
Holotype ♂ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Lordberg [4°50'S 142°29'E], 1000m, 29.-30. XI.1912, leg. S. G. Bürgers (DORSA: BXepifatHTF).
Paratype ♂ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Regenberg [4°52' 144°07'E], 550m, 8.-15.V.1913, leg. S. G. Bürgers (DORSA: BXepifatPM1).
Note: The labels of holotype and paratype were switched around when the photographs were taken. The specimens are described correctly in the publication.

Distribution: Only found at the type localities in the upper Sepik River system.

***Epitettix humilicolus* Günther, 1938** (Plate 72 figs 5-6, 9)
Holotype ♂ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Standlager bei Malu [4°13'S 142°49'E], III.-

IV.1912, leg. S. G. Bürgers (Dorsa: BXepihumHTM).
Additional material: 1♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Hauptlager bei Malu (Nr. 107) [4°13'S 142°49'E], 3.VIII.1912, leg. S. G. Bürgers.

Distribution: Only found at the type locality at the upper Sepik River.

Epitettix lativertex **Günther, 1938**
Holotype ♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Lordberg [4°50'S 142°29'E], 2.-4.XII.1912, leg. S. G. Bürgers (DORSA: BXepifatHTF).

Distribution: Only found at the type locality at the upper Sepik River.

Epitettix punctatus **Hancock, 1907**
Type ♂ SMSM, MALAYSIA: Borneo, Kuching.

Distribution: Only found on Borneo.

Epitettix **(?)** ***spheniscus*** **Günther, 1974**
Syntypes ♂♂ MNHN, MADAGASCAR: Namoraka.

Distribution: Only found on Madagascar.

Epitettix striganovae **Storozhenko, 2012**
Holotype ♀ ZIN, VIETNAM: Lam Dong Prov., environs of Long Lanh, Biu Doup, Nui Ba Nature Reserve, 12°10'N 108°40'E, 1400-1900 m, 1.-22.IV.2008, leg. D. Fedorenko.
Paratype ♂ ZIN, VIETNAM: Lam Dong Prov., environs of Long Lanh, Biu Doup, Nui Ba Nature Reserve, 12°10'N 108°40'E, 1400-1900 m, 1.-22.IV.2008, leg. D. Fedorenko.

Distribution: Only found at the type locality in Vietnam.

Epitettix tamilus **Günther, 1939**
Holotype ♀, NZSI: INDIA: Kerala, Cochin [Kochi], forest tramway.

Distribution: Only found near Kerala in India.

Epitettix tumidus **Günther, 1938**
Holotype ♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Etappenberg [4°38'S 142°28'E], 16.-18.XI.1912, leg. S. G. Bürgers (DORSA: BXepilatHTF).

Distribution: Only found at the type locality at the upper Sepik River.

Eurymorphopus **Hancock, 1907**
Type species: *Eurymorphopus cunctatus* (Bolívar, 1887).
Diagnosis: *Eurymorphopus* Hancock, 1907 is closely related to *Planotettix* gen. nov. The two *Eurymorphopus*-species are brachypronotal, the *Planotettix*-species are micropronotal. In *Planotettix* gen. nov., the internal lateral carina is lost. In *Eurymorphopus* Hancock, 1907 the internal lateral carina is clearly visible.
Distribution: Two species only found on New Caledonia.

Eurymorphopus bolivariensis **sp. nov.** (Plate 73 figs 1, 3, 5)
Holotype ♀ MHNG, NEW CALEDONIA.

Derivatio nominis: Patronymic. The species is named after Ignacio Bolívar.
Measurements: Pronotum length 6.8 mm, pronotum lobe width 4.35 mm, pronotum height 1.62 mm, postfemur length 4.45 mm, postfemur width 1.53 mm, vertex width 0.6 mm, eye width 0.4 mm.
Description: Head not exerted above the pronotum. Fastigium projecting before the eyes. Anterior border of the fastigium straight. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved inwards. Medial carina not elevated. Fossulae obsolete. Frontal costa, in lateral view, arched before the upper half of the eye. Fascial carinae, in lateral view, not arched before the antenna. Scutellum, in frontal view broad, a little broader than an antennal groove. Furcation of the frontal costa above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the fastigium. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum flattened, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. Prozonal carinae parallel or curved a little outwards towards the anterior border of the pronotum. Humeral angles and interhumeral carinae absent. Internal lateral carinae nearly straight. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process short, not reaching the end of the knees of the hind femora, seen from above, broadly truncated, posteriorly with a spine in the extension of the median carina. Tegmen and hind wings absent. The dorsal margin of the anterior and middle femora

undulating. The ventral margin with three lappets and without hairs. The second segment of the tarsus short. Hind femora slender (3x longer than wide). The ventro-external carina with one small lappets curved laterally. Genicular- and antegenicular teeth not visible. Posttibia brown with two white bands. Pulvilli obtuse. Colour from above in the anterior half light brown, in the posterior half brown.
Differential diagnosis: *Eurymorphopus bolivariensis* differs from *Eurymorphopus cunctatus* by the projection of the fastigium.
Distribution: New Caledonia.

***Eurymorphopus cunctatus* (Bolívar, 1887)** (Plate 73 figs 2, 4, 6)
Syntype ♂ IRSNB, NEW CALEDONIA: leg. Hanckar.
I only examined the syntype from IRSNB but did not have access to the syntype from NMW.

Measurements: Pronotum length 5.04 mm, pronotum lobe width 3.25 mm, pronotum height 1.4 mm, postfemur length 4.1 mm, postfemur width 1.29 mm, vertex width 0.54 mm, eye width 0.36 mm.
Differential diagnosis: Günther (1972) reported about two specimens in bad condition from MNHM. But Günther did not examine a syntype of *Eurymorphopus cunctatus* and only referred to Kaltenbach who compared the specimen from Vienna with the description of Günther. The distinguishing mark of the two specimens is the furcation of the frontal costa: between the superior ocelli but below the ventral margin of the eyes. This is a unique feature and if he is correct, postulating a new species should be considered. Further research is necessary.
Distribution: New Caledonia.

***Gavialidium* Saussure, 1862**
Type species: *Gavialidium crocodilum* (Saussure, 1862)
Note: Storozhenko (2011) transferred the genus with the following two species to the Cladonotinae.
Distribution: South-East-Asia from India to New Guinea.

***Gavialidum crocodilum* Saussure, 1862**
Syntypes 3♀, 6♂ MHNG, SRI LANKA: Kaduganawa.

Distribution: Sri Lanka.

***Gavialidum philippinum* Bolívar, 1887**
Lectotype ♀ MNMS, PHILIPPINES.

Distribution: Philippines.

***Gestroana* Berg, 1898**
Type species: *Gestroana discoidea* Bolívar, 1898.
The genus was established by Bolívar 1898 under the name *Gestroa* with the type species *Gestroa discoidea*. Bolívar missed that Pini (1876) had established the name for the still valid genus of Mollusca. Berg (1898) established the homonymy and renamed the genus to *Gestroana* Berg, 1900.
Description: Small micropronotal species without flying organs. The antennae inserted deeply below the lower margin of the eyes. Along the line of the median carina sometimes bizarre growth of the pronotal crest. Antegenicular teeth in most species relatively large.
Diagnosis: Closely related to *Cladonotella* Hancock, 1909. But the species of *Cladonotella* Hancock, 1909 are larger and just have some growth at the entire of the anterior part of the pronotum and not only just at the median carina.
Distribution: Endemic of New Guinea. Most species found in the mountains.

***Gestroana bicristulata* (Günther, 1938) comb. nov.** (Plate 74 fig. 1)
Cladonotella bicristulata Günther, 1938 [description]
Holotype ♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Quelllager (Nr. 128) [4°32'S 142°41'E], 13.-16. VIII.1912, leg. Bürgers (DORSA: BXclabicHTF).

Differential diagnosis: In all characteristics the species belongs to *Gestroana* Berg, 1900 and not to *Cladonotella* Hancock, 1909. The pronotal crest of the small species is narrow and bimodal with a distinct emargination above the mid femora.
Distribution: Only found in one location at the upper Sepik River.

***Gestroana baiyerriveriensis* sp. nov.** (Plate 74 fig. 2, plate 76 fig. 1, plate 78 fig. 1)
Holotype ♀, BPBM: PAPUA NEW GUINEA: [Western Highlands Prov.], Baiyer River [5°32'S 144°09'E], 1150 m, 18.X.1958, leg. J. L. Gressitt.

Derivatio nominis: The species is named after the type locality.
Measurements: Pronotum length 6.89 mm, pronotum lobe width 3.68 mm, pronotum height 2.4 mm, postfemora lost, vertex width 0.84 mm, eye width 0.36 mm.
Description: Rather small micropronotal species.

Fastigium not reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the vertex a little lower than the posterior half. Fossulae deep. Vertex 2.3x broader than an eye. Transverse and secondary carinae absent. Lateral carinae short and curved inwards. Medial carina starts near the anterior border of the fastigium, a little lamellate. Frontal costa, in lateral view, not arched and not visible in front of the eyes. Fascial carinae, in lateral view, arched before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with one higher elevation in the anterior half and one lower elevation in the posterior part. Laterally two elevations as smaller humps above the middle femora. The first elevation starts at the end of the prozona. The median carina slightly increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona existing only as a short dot at the anterior margin. Prozonal carinae straight and, in lateral view, arched. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow and reaching the end of the pronotum, the dorsal margin with two nearly straight sections in the middle and posterior third. Lateral lobes strongly curved laterally. In dorsal view rounded and curved posteriorly. Flight organs absent. The dorsal margin of the 9 tergite without any tubercles. Ventral margin of the anterior and middle femora with lobes or undulated. Middle femora ventral with some short hairs. Second segment of tarsus short.
Differential diagnosis: Specific for this species is the infrascapular area with two nearly straight sections in the middle and posterior third of the dorsal margin.
Distribution: Only found in the location of Baiyer River.

***Gestroana cyclopensis* sp. nov.** (Plate 74 fig. 3, plate 76 fig. 2, plate 78 fig. 2)
Holotype ♀ BPBM, WEST PAPUA: Cyclops Mountains, Ifar [2°34'S 140°31'E], 300-500 m, 23.-25.VI.1962, leg. J. Sedlacek.

Derivatio nominis: The species is named after the type locality.

Measurements: Pronotum length 4.16 mm, pronotum lobe width 3.92 mm, pronotum height 2.96 mm, postfemur length 4.16 mm, postfemur width 1.44 mm, vertex width 1.08 mm, eye width 0.38 mm.
Description: Rather small micropronotal and wingless species with a wide vertex and a serrulate pronotal crest. Fastigium reaching the frontal margin of the eyes. Anterior half of the Vertex a little lower than the posterior half. Fossulae deep. Vertex 2.8x broader than an eye. Transverse and secondary carinae absent. Lateral carinae short and straight. The upper margin curved outwards, in lateral view, visible above the eyes. Medial carina starts in line with the supraocular lobes, strongly elevated and lamellate. In lateral view visible above the eyes. The whole frontal costa in lateral view visible before the eyes. Fascial carinae in lateral view slightly arched before the antennae. Scutellum in frontal view very broad, broader than an eye. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with one high pronotal crest in the anterior half. The pronotal crest starts vertically increasing at the posterior margin of the prozona. The median carina slightly descending posteriorly, with one spine near the apex. Some spines and lappets on the pronotum. Anterior border of the pronotum slightly concave between the prozonal carinae. Prozonal carinae longer, straight and spiny. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally, rounded and saw-toothed. Pronotal process surpassing the middle of the hind femora. The apex seen from above broadly concave. Flight organs absent. The dorsal margin of the 7., 8. and 9. tergite with 2 longer spines, the 10. tergite with two longer spines side by side. Dorsal and ventral margin of the anterior and middle femora with 2-3 acute lobes. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora slightly slender (2.9x longer than wide). The dorsal and median external area with high and broad elevations. Hind tibia brownish with a light antegenicular band. Genicular- and antegenicular teeth large and serrulate, the antegenicular teeth larger than the Genicular teeth. Last article of the tarsi a little shorter than the first. First and second

pulvilli short and acute, the first tiny. The third acute pulvilli longer than the sum of the first and second.
Differential diagnosis: Specific for this species are the vertical increasing serrulate pronotal crest, the relatively broad vertex, the large elevations on the hind femora and the spines on the last tergites.
Distribution: Only found in the Cyclops Mountains.

***Gestroana discoidea* Berg, 1898** (Plate 75 figs 4-5, plate 76 figs 3-4, plate 78 figs 3-4)

Holotype ♂ MSNG, PAPUA NEW GUINEA: Nuova Guinea, [Western Prov.], Fly River 1876-77, leg. L. M. D'Albertis.
Note: The specimen is labelled with an old "Typus"-label. The label "Sintipo" is from Mercedes París (1994). But I think this specimen is the Holotype.
Paratypes 1♀ (1/2) MNCN, PAPUA NEW GUINEA: Nuova Guinea, [Western Prov.], Fly River 1876-77, leg. L. M. D'Albertis (Cat. Tipos no. 159); 1♂ (2/2) MSNG, PAPUA NEW GUINEA: Nuova Guinea, [Western Prov.], Fly River 1876-77, leg. L. M. D'Albertis.
Note: The specimens are labelled as "Sintipo" and "Syntypus". The label "Sintipo" is from Mercedes París (1994). But I think both specimens are paratypes.
Additional material: 2♀, 4♂ BPBM, PAPUA NEW GUINEA: [Western Prov.], Fly River, Olsobip [5°23'S 141°32'E], 400-600 m, VIII.1969, leg. J. & M. Sedlacek.

Measurements holotype ♂: Pronotum length 4.8 mm, pronotum lobe width 3.9 mm, pronotum height 3.9 mm, postfemur length 4.75 mm, postfemur width 1.9 mm, vertex width 0.94 mm, eye width 0.42 mm. Paratype 1/2 ♀: pronotum length 6.37 mm, pronotum lobe width 4.42 mm, pronotum height 4.55 mm, postfemur length 5.59 mm, postfemur width 2.21 mm, vertex width 1.1 mm, eye width 0.5 mm. Paratype 2/2 ♂: pronotum length 4.75 mm, pronotum lobe width 3.9 mm, pronotum height 3.5 mm, postfemur length 4.85 mm, postfemur width 1.85 mm, vertex width 1.02 mm, eye width 0.4 mm.
Differential diagnosis: Easy to identify by the high, rounded and serrated pronotal crest.
Distribution: Found in the south of New Guinea in the Fly River area.

***Gestroana flasbarthi* sp. nov.** (Plate 74 fig. 6, plate 76 fig. 5, plate 78 fig. 5)

Holotype ♂ BPBM, PAPUA NEW GUINEA: [Southern Highlands Prov.], Dimifa, SE of Mt. Giluwe [6°05'S 143°41'E], 2200 m, 12.X.1958, leg. J. L. Gressitt.
Paratype 1♂ (1/1) BPBM, PAPUA NEW GUINEA: [Western Highlands Prov.], 11 km S of Mt. Hagen (town), 2200-2300 m, 21.V.1963, leg. J. Sedlacek, deposited in ZFMK.
Derivatio nominis: Patronymic. The species is named after Jochen Flasbarth, the former president of the Naturschutzbund Deutschland and the former president of the German Umweltbundesamt.
Measurements holotype ♂: Pronotum length 3.84 mm, pronotum lobe width 3.36 mm, pronotum height 2.16 mm, postfemur length 4.4 mm, postfemur width 1.68 mm, vertex width 0.84 mm, eye width 0.42 mm. Paratype ♂ (1/1): pronotum length 4 mm, pronotum lobe width 3.28 mm, pronotum height 2.48 mm, postfemur length 4.64 mm, postfemur width 1.44 mm, vertex width 0.88 mm, eye width 0.46 mm.
Description holotype ♂: Rather small micropronotal and wingless species. Fastigium nearly reaching the frontal margin of the eyes. Anterior half of the vertex a little lower than the posterior half. Fossulae moderately deep. Vertex 2x broader than an eye. Lateral and secondary carinae nearly rounded, reaching the median carina. Lateral carinae curved strongly inwards. Secondary carinae curved transverse back to the medial carina. Medial carina starts near the anterior border of the fastigium, a little lamellate. In lateral view not visible above the eyes. Frontal costa not elevated. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with one higher elevation in the anterior half and one lower elevation in the posterior part. Laterally two elevations as smaller humps above the middle femora. The first elevation starts at the anterior margin of the prozona. The median carina not increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Prozonal carinae longer and a little lamellate and arched. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area a little broader, in dorsal view slightly undulating, reaching the end of the pronotum. Lateral lobes strongly curved laterally, rounded. Pronotal process reaching the middle of the hind femora, the apex seen from above truncated, slightly concave. Flight organs absent. The dorsal margin of the 9. tergite with 4 and more separated tubercles, the 10. tergite with two longer spines. Ventral margin of the anterior and middle femora with 2-3 smaller

lobes, the dorsal margin undulated. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora stout (2.5-2.6x longer than wide). The dorsal and median external area with some rounded elevations, the ventro-external carina with one lobe curved outwards. The ventral margin of the hind femora with small lobes. Hind tibia brownish. Genicular teeth and antegenicular teeth medium sized, rounded. Last article of the tarsi shorter than the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second. Colour brownish with some lighter parts.

Differential diagnosis: Specific for this species is the anterior elevation of the pronotum. The elevation starts at the anterior margin of the prozona.

Distribution: Only found in higher mountain regions between Mt. Hagen and Mt. Giluwe.

Gestroana gressitti **sp. nov.** (Plate 74 fig. 7, plate 76 fig. 6, plate 78 fig. 6)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Chimbu Prov.], Karimui [6°30'S 144°51'E], Malaise Trap, 2.-3. VI.1961, leg. J. L. Gressitt.

Derivatio nominis: The species is named after the collector J. Linsley Gressitt.

Measurements holotype ♀: Pronotum length 4.55 mm, pronotum lobe width 3.77 mm, pronotum height 2 mm, postfemur length 5.12 mm, postfemur width 1.74 mm,
vertex width 0.7 mm, eye width 0.5 mm.

Description holotype ♀: Rather small micropronotal and wingless species. In most characteristics like *Gestroana flasbarthi*. But the scutellum of *Gestroana gressitti* is slightly narrower. The vertex is only 1.4x broader than an eye. The first elevation starts at the posterior margin of the prozona. The apex of the pronotal process seen from above is rounded convex. The dorsal margin of the 9. tergite with 2 very small tubercles and the 10. tergite without longer spines only with two tubercles like a tiny dot. Hind femora more slender (2.9x longer than wide). The outside of the hind femora only with one rounded hump in the dorsal external area. The ventro-external carina without a lobe. Genicular teeth and antegenicular teeth a little smaller and serrated.

Differential diagnosis: Closely related to *Gestroana flasbarthi*. However, due to the above described differences, I do not identify this specimen as the unknown female of *Gestroana flasbarthi*. Further examination of material, especially of males from the region of Karimui and females from the Mt. Giluwe and Mt. Hagen region, is necessary to make a decision.

Distribution: Only found at Karimui.

Gestroana karimuiensis **sp. nov.** (Plate 74 figs 9-10, plate 76 figs 8-9, plate 78 figs 8-9)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Chimbu Prov.], Karimui [6°30'S 144°51'E], 1080 m, 11.-12. VII.1963, leg. J. Sedlacek.

Paratypes ♀ (1/4) BPBM, PAPUA NEW GUINEA: [Chimbu Prov.], Karimui [6°30'S 144°51'E], South of Goroka, 1000 m, 7.VI.1961, deposited in ZFMK; ♂ (2/4) BPBM, PAPUA NEW GUINEA: [Chimbu Prov.], Karimui [6°30'S 144°51'E], 1080 m, 8-10.VII.1963, leg. J. Sedlacek, deposited in NCB-RMNH. 2♂ larvae (3/4 + 4/4) BPBM, PAPUA NEW GUINEA: [Chimbu Prov.], Karimui [6°30'S 144°51'E], South of Goroka, 1000 m, 7.VI.1961, leg. J. L. & M. Gressitt.

Derivatio nominis: The species is named after the type locality.

Measurements, holotype ♀: pronotum length 4.81 mm, pronotum lobe width 4.29 mm, pronotum height 3.95 mm, postfemur length 5.2 mm, postfemur width 2 mm, vertex width 1.06 mm, eye width 0.46 mm. Paratype ♀ (1/2): pronotum length 4.56 mm, pronotum lobe width 3.92 mm, pronotum height 4.29 mm, postfemur length 5.85 mm, postfemur width 2.08 mm, vertex width 1.14 mm, eye width 0.5 mm. Paratype ♂ (2/2): pronotum length 4.56 mm, pronotum lobe width 3.92 mm, pronotum height 3.36 mm, postfemur length 4.8 mm, postfemur width 1.84 mm, vertex width 0.96 mm, eye width 0.44 mm.

Description, holotype ♀: Small micropronotal and wingless species with serrulate and acute pronotal crest. Fastigium not reaching the frontal margin of the eyes. Anterior half of the Vertex a little lower than the posterior half. Fossulae deep. Vertex 2.3x broader than an eye. Transverse and secondary carinae absent. Lateral carinae short and curved inwards. In lateral view the lateral carinae minimally visible above the eyes. Medial carina starts near the anterior border of the fastigium, not lamellate. In lateral view not visible above the eyes. The frontal costa, in lateral view, not arched and visible before the eyes. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes touching the anterior margin of the pronotum.

Antennae inserted a little more than 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum in lateral view with one high and acute pronotal crest in the anterior half. The margin of the pronotum serrulate, in the posterior half with longer spines. The pronotum starts increasing at the posterior margin of the prozona. The dorsal margin of the pronotal crest with a distinct depression above the beginning of the hind femora. Some spines on the pronotum. Anterior border of the pronotum straight. Prozonal carinae short, straight and spiny. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, the dorsal margin with a distinct arch before the posterior third. Lateral lobes strongly curved laterally, rounded and saw-toothed. Pronotal process surpassing the middle of the hind femora. The apex seen from above broadly concave. Flight organs absent. The dorsal margin of the 9. tergite with 2 longer spines, the 10. tergite with two spines side-by-side. Dorsal and ventral margin of the anterior and middle femora undulated. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora slightly slender (2.6x longer than wide). The dorsal and median external area with some small spiny elevations. The ventro-external carina with a small spiny lobe. Hind tibia brownish with a light antegenicular band. Genicular teeth smaller and acute. Antegenicular teeth large and serrulate. Last article of the tarsi as long as the first. First and second pulvilli short and obtuse. The third acute pulvilli longer than the sum of the first and second. The male a little smaller but with the same characteristics as the female.

Differential diagnosis: Specific for this species is the increasing serrulate and spiny pronotal crest with a distinct depression posteriorly.

Distribution: Only found at Karimui.

***Gestroana kleukersi* sp. nov.** (Plate 75 fig. 1, plate 77 fig. 1, plate 79 figs 1, 9)

Holotype ♀ NCB-RMNH, WEST PAPUA: Araucaria Camp [3°30'S 139°11'E], 800 m, 2.III.1939, Neth. Ind.-American New Guinea Expedition, leg. L. J. Toxopeus.

Derivatio nominis: Patronymic. The species is named after Roy Kleukers, a famous Dutch orthopterologist and my good friend.

Measurements: Pronotum length 4.42 mm, pronotum lobe width 3.9 mm, pronotum height 2.47 mm, postfemur length 5.2 mm, postfemur width 1.43 mm, vertex width 0.8 mm, eye width 0.42 mm.

Description: Rather small micropronotal species with deeply inserted antennae and slender hind femora. Fastigium not reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the vertex a little lower than the posterior half. Fossulae moderately deep. Vertex nearly 2x broader than an eye. Lateral and secondary carinae nearly u-shaped. Lateral carinae short and curved inwards, in lateral view visible above the eyes. Medial carina at the anterior margin nearly absent. Frontal costa in lateral view a little arched before the eyes. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 2x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum in lateral view with three elevations. One, in the anterior half, the second above the middle of the infrascapular area, and the third at the posterior end of the pronotum. Between the first and second elevation a broadly u-shaped depression. The first elevation starts behind the posterior end of the prozona. No humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona reaching the anterior margin. Prozonal carinae straight. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally and quadratic. The apex of the pronotum seen from above concave. Flight organs absent. The dorsal margin of the 9. tergite with small tubercles. Ventral and dorsal margins of the anterior and middle femora with 2-3 lobes. Middle femora ventral without short hairs. Second segment of tarsus short. Hind femora slender (3.6x longer than wide). The dorsal and median external without rounded elevations. Ventro-external carina with two lobes curved outwards. The ventral margin of the hind femora with small lobes. Hind tibia brownish with lighter areas. Genicular- and antegenicular teeth small and acute. Last article of the tarsi nearly as long as the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second.

Differential diagnosis: Specific for this species are the deeply inserted antennae and the slender hind femora.

Distribution: Only found at the type locality in the northwest of West Papua.

Gestroana moanemaniensis **sp. nov.** (Plate 75 fig. 2, plate 77 fig. 2, plate 79 fig. 2)

Holotype ♂ BPBM, WEST PAPUA: Wisselmeren, Moanemani, Kamo V. [3°55'S 136°15'E], 1500 m, 15.VIII.1962, leg. J. Sedlacek.

Derivatio nominis: The species is named after the type locality.

Measurements: Pronotum length 3.9 mm, pronotum lobe width 3.25 mm, pronotum height 1.9 mm, postfemur length 4.16 mm, postfemur width 1.69 mm, vertex width 0.78 mm, eye width 0.34 mm.

Description: Rather small micropronotal and wingless species. Fastigium not reaching the frontal margin of the eyes. Anterior half of the Vertex not lower than the posterior half. Fossulae deep. Vertex nearly 3x broader than an eye. Lateral and secondary carinae nearly rounded, reaching the median carina. Lateral carinae curved strongly inwards. Secondary carinae curved transverse back to the medial carina. Medial carina starts near the anterior border of the fastigium, a little lamellate. In lateral view not visible above the eyes. Frontal costa not elevated. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view moderately broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum in lateral view with one arched elevation in the anterior half and two laterally smaller humps above the middle femora. The first elevation starts at the posterior end of the prozona. The median carina not increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona existing only as a short dot at the anterior margin. Prozonal carinae longer and a little lamellate. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area smaller, reaching the end of the pronotum. Lateral lobes strongly curved laterally, slightly rounded, posterior margin truncate. Pronotal process extending over the middle of the hind femora, the apex, seen from above, truncated without any sulcation. Flight organs absent. The dorsal margin of the 9. tergite with 3 tubercles, the middle broader and obtuse. Ventral and dorsal margin of the anterior and middle femora with 2-3 lobes. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora stout (2.5x longer than wide). The dorsal and median external area with some rounded elevations. The ventral margin of the hind femora with small lobes. Hind tibia brown with a light antegenicular band. Genicular teeth medium sized, rounded. Antegenicular teeth broad and rounded. Last article of the tarsi a little shorter than the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second. Colour brownish. The paraproctum of the genital with two slightly curved titillators. The apex of the titillators conical and obtuse.

Differential diagnosis: Characteristic combination of morphological elements: lower arched anterior elevation of the pronotum, three separate elevations of the pronotum, median carina flattened in the posterior half, relatively large and broad antegenicular teeth and three specific tubercles on the posterior margin of the 9 tergite.

Distribution: Only found in one place near Moanemani.

Gestroana morobensis **sp. nov.** (Plate 75 fig. 3, plate 77 fig. 3, plate 79 fig. 3)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Mt. Kaindi [7°21'S 146°41'E], 2350 m, 11.IX.1968, leg. J. Sedlacek.

Paratypes 1♀ (1/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Mt. Kaindi [7°21'S 146°41'E], 2350 m, 11.IX.1968, deposited in NCB-RMNH; 1♀ (2/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Wau, Big Wau Creek, 1200-1500 m, IX.1965, leg. J. & M. Sedlacek, deposited in ZFMK; 1♀ (3/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Wau, Edie Creek [7°21'S 146°40'E], 2100-2300 m, 3.X.1964, leg. J. Sedlacek, deposited in BMNH; 1♀ (4/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Wau Subdist., 30-35 km ESE Kaisenik, 1600-2290 m, 5.X.1974, leg. J. L. Gressitt, deposited in IRSNB; 1♀ (5/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Bulldog Road, 40 km S. Wau, 2700-2800 m, 22.-31.V.1969, deposited in MSNG; 1♀ (6/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Mt. Missim, E. Wau [7°13'S 146°49'E], 2800 m, 22.-30. IV.1968, leg. J. L. Gressitt, Rice, R. C. A. & J. Sedlacek, deposited in ZMHU; 2♀ (7/10+8/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Bulolo Vatut [7°15'S 146°37'E], 700-800 m, 1.-7.VI.1969, leg. J. Sedlacek, 7/10 deposited in ANIC and 8/10 deposited in MNCN; 1♂ larva (9/10) BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Wau, 1150-1250 m, 17.II.1966, leg. J. Sedlacek; 1♀ larva (10/10) BPBM, PAPUA NEW GUINEA: [Central

Prov.], Mt. Chapman, 7°19'S 145°48'E, 2000 m, 5.V.1966, leg. J. L. Gressitt.

Derivatio nominis: The species is named after the type locality.
Measurements, holotype ♀: Pronotum length 5.07 mm, pronotum lobe width 4.16 mm, pronotum height 2.6 mm, postfemur length 5.2 mm, postfemur width 1.82 mm, vertex width 1 mm, eye width 0.36 mm. Paratypes ♀♀ (1/8-8-8): Pronotum length 4.8-5.44 mm, pronotum lobe width 3.76-4.48 mm, pronotum height 2.08-2.56 mm, postfemur length 4.48-5.12 mm, postfemur width 1.68-1.84 mm, vertex width 0.8-0.88 mm, eye width 0.34-0.44 mm.
Description: Rather small micropronotal species with an elevated medial carina at the tip of the fastigium. Fastigium reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the Vertex not lower than the posterior half. Fossulae deep. Vertex nearly 3x broader than an eye. Lateral and secondary carinae nearly u-shaped, not reaching the median carina. Lateral carinae curved strongly inwards. Secondary carinae approximately obsolete. Medial carina starts near the anterior border of the fastigium, strongly elevated and broadly. In lateral view visible above the eyes. Frontal costa not elevated. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view moderately broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with one elevation in the anterior half and two lateral elevations above the middle femora. The first elevation starts at the posterior end of the prozona. The median carina slightly increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona absent. Prozonal carinae longer and lamellate. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area broader, the dorsal margin strongly undulated, reaching the end of the pronotum. Lateral lobes strongly curved laterally and slightly rounded. Pronotal process extending to the middle of the hind femora, the apex seen from above truncated and sulcated in the middle. Flight organs absent. The dorsal margin of the 9. tergite without any tubercles. Ventral margin of the anterior and middle femora with 2-3 longer and broader lappets, the dorsal margins with lobes. Middle femora ventral without short hairs. Second segment of tarsus short. Hind femora moderately stout (2.8x longer than wide). The dorsal and median external area and the ventro-external carina with some different rounded elevations. The ventral margin of the hind femora with small lobes. Hind tibia brownish with lighter sections in the upper half. Genicular teeth medium sized, rounded. Antegenicular teeth medium sized, broad and acute. Last article of the tarsi shorter than the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second. Colour brownish with some lighter sections on the infrascapular area and the posterior part of pronotum.
Differential diagnosis: Specific for *Gestroana morobensis* is the lamellate medial carina, in lateral view broadly visible above the eyes and the undulated dorsal margin of the infrascapular area. Only *Gestroana cyclopensis* sp. nov. has a medial carina visible above the eyes in lateral view. But this species has a height and serrulate pronotal crest.
Distribution: Found on different places in Morobe Province and at Mt. Chapman in Central Province.

***Gestroana mounthagensis* sp. nov.** (Plate 75 fig. 4, plate 77 fig. 4, plate 79 fig. 4)
Holotype ♂ BPBM, PAPUA NEW GUINEA: [Western Highlands Prov.], Tomba, slopes of Mt. Hagen [5°50'S 144°01'E], 2450 m, 23.V.1963, leg. J. Sedlacek.

Derivatio nominis: The species is named after the type locality.
Measurements Holotype ♂: pronotum length 4.4 mm, pronotum lobe width 3.6 mm, pronotum height 2.32 mm, postfemur length 4.4 mm, postfemur width 1.76 mm, vertex width 0.88 mm, eye width 0.46 mm.
Description: Rather small micropronotal and wingless species. Fastigium not reaching the frontal margin of the eyes. Anterior half of the Vertex not lower than the posterior half. Fossulae deep. Vertex nearly 2x broader than an eye. Lateral and secondary carinae nearly rounded, not reaching the median carina. Lateral carinae curved strongly inwards. Secondary carinae curved transverse back to the medial carina. Medial carina starts near the anterior border of the fastigium, a little lamellate and forming a short ridge. In lateral view not visible above the eyes. Frontal costa between medial carina and scutellum absent. Fascial carinae, in lateral view, a little arched

before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa absent. The scutellum is open upwards. Superior ocelli slightly under the line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Antennae short, with 3 lighter articles. Pronotum, in lateral view, with one arched elevation in the anterior half and one lower elevation in the posterior half. The first elevation starts at the posterior end of the prozona. The median carina is slightly increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona existing only as a very small dot at the anterior margin. Prozonal carinae longer and a little lamellate. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area smaller, reaching the end of the pronotum. Lateral lobes strongly curved laterally and rounded. Pronotal process extending to the middle of the hind femora, the apex seen from above truncated without any sulcation. Flight organs absent. The dorsal margin of the 9. tergite with 4 very small tubercles. The dorsal margin of the 10. tergite with 2 tubercles. Ventral and dorsal margin of the anterior and middle femora undulated. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora stout (2.5x longer than wide). The dorsal and median external area with some rounded elevations. The ventro-external carina with a bigger and a smaller lobe. The ventral margin of the hind femora with small lobes. Hind tibia brown with two light bands. Genicular teeth medium sized, rounded. Antegenicular teeth broad and rounded. Last article of the tarsi shorter than the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second. Colour brownish.

Differential diagnosis: Similar to *Gestroana moanemaniensis* and *Gestroana willemsei*. But the posterior part of the prozona of *Gestroana mounthagensis* is increasing and not flattened.

Distribution: Only found on Mt. Hagen.

***Gestroana pannosa* sp. nov.** (Plate 75 fig. 5, plate 77 fig. 5, plate 79 fig. 5)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Eastern Highlands Prov.], Purosa, 20-26 km SE Okapa [6°39'S 145°32'E], 1800-2020 m, 28.VIII.1964, leg. J. & M. Sedlacek.

Derivatio nominis: Named because of the long lappets at the ventral margin of the anterior and middle femora (Latin: "pannus").

Measurements: Pronotum length 4.4 mm, pronotum lobe width 4.16 mm, pronotum height 2.16 mm, postfemur length 4.4 mm, postfemur width 1.76 mm, vertex width 2.4 mm, eye width 0.34 mm.

Description: Rather small micropronotal species with long lappets at the ventral margin of the anterior and middle femora. Fastigium not reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the Vertex lower than the posterior half, covered with small tubercles. Fossulae deep. Vertex 2x broader than an eye. Lateral and secondary carinae nearly u-shaped, not reaching the median carina. Lateral carinae curved inwards. Secondary carinae almost obsolete. Medial carina existing only as a short and low ridge at the anterior margin in transition to the frontal costa. Frontal costa in lateral view not arched and not visible in front of the eyes. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view moderately broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum in lateral view with two elevations, the posterior not as high as the anterior elevation. The first elevation starts at the posterior end of the prozona. In line of the lateral lobes in dorsal view three separate humps side by side. The second elevation starts above the beginning of the hind femora. Between the elevations is a broadly u-shaped depression. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina extending to the anterior border. Prozonal carinae straight. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally broadly rounded. Pronotal process extending to the middle of the postfemur, the apex, seen from above, truncated and a little emarginated. Flight organs absent. The dorsal margin of the 8. and 9. tergite in extension of the posterior edges of the pronotum with two distinct tubercles curved posteriorly. Ventral margin of the anterior and middle femora with 2-3 long lappets, the dorsal margins with bigger lobes. Middle femora ventral with short hairs. Second segment of tarsus short. Hind femora stout (2.5x longer than wide). The dorsal and median external area and the ventro-external carina with some rounded elevations. The ventral margin of the hind femora with small lobes. Hind tibia uniformly brown with a lighter antegenicular band. Genicular teeth medium sized and rounded. Antegenicular teeth relatively large and rounded. Between genicular- and antegenicular teeth a small lappet – perhaps the real antegenicular teeth. Last article of the tarsi nearly as long as the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of the first and second.

Differential diagnosis: Specific for *Gestroana pannosa* are the long lappets on the ventral margin of the anterior and middle femora. Even *Gestroana yapenensis* sp. nov. and *Gestroana morobensis* sp. nov. have similar long lappets. But in dorsal view the apex of the pronotal process is different: narrow and rounded in *Gestroana yapenensis*, triangularly sulcated in *Gestroana morobensis* and slightly concave in *Gestroana pannosa*.

Distribution: Only found in Purosa near Okapa.

Gestroana sedlaceki **sp. nov.** (Plate 75 fig. 6, plate 77 fig. 6, plate 79 fig. 6)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Eastern Highlands Prov.], Purosa, 20-26 km SE Okapa [6°39'S 145°32'E], 1800-2020 m, 28.VIII.1964, leg. J. & M. Sedlacek.

Derivatio nominis: Patronymic. The species is named after the collector Josef Sedlacek.

Measurements: Pronotum length 4.8 mm, pronotum lobe width 4.16 mm, pronotum height 2.72 mm, postfemur length 5 mm, postfemur width 2.15 mm, vertex width 0.94 mm, eye width 0.4 mm.

Description: Rather small micropronotal species. Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the Vertex lower than the posterior half, covered with small tubercles. Fossulae moderately deep. Vertex 2x broader than an eye. Lateral and secondary carinae nearly u-shaped, not reaching the median carina. Secondary carinae almost absent. Medial carina existing only as a short elevation at the anterior margin in transition to the frontal costa, not visible in lateral view. Frontal costa in lateral view not arched and not visible in front of the eyes. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view broad. Furcation of the frontal costa above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes touching the anterior margin of the pronotum. Antennae inserted more than 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with two elevations, increasing posteriorly. The first one starts at the posterior end of the prozona. The second one is above the beginning of the hind femora. Between the elevations is a u-shaped depression. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina ends at the frontal border with a small tubercles. Prozonal carinae short and straight. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally broadly rounded, the posterior margin truncated. Pronotal process not extending beyond the middle of the postfemur, the apex, seen from above, truncated and a little concave. Flight organs absent. The dorsal margin of the 9. tergite at the posterior margin with a series of small tubercles (like a denture). Dorsal and ventral margin of the anterior and middle femora with lobes, middle femora ventral with hairs. Second segment of tarsus short. Hind femora stout (2.3x longer than wide). The dorsal and median external area with some elevations. The ventral margin of the hind femora with lobes. Hind tibia uniformly brown. Genicular teeth medium sized. Antegenicular teeth relatively large and rounded. Last article of the tarsi nearly as long as the first. First and second pulvilli short and spinose, the third pulvilli as long as the sum of the first and second.

Differential diagnosis: Relatively short and broad pronotum with a u-shaped depression of the median carina. Pronotum increasing posteriorly. Found at the same location as *Gestroana pannosa* but definitely a different valid species. E.g. *Gestroana sedlaceki* does not have such long lappets on the ventral margin of the anterior and middle femora. *Gestroana pannosa* has only 2 distinct tubercles on the upper margin of the 9 tergite.

Distribution: Only found in the location of Purosa.

Gestroana willemsei **sp. nov.** (Plate 75 figs 7-8, plate 77 figs 7-8, plate 79 figs 7-8)

Holotype ♂ NCB-RMNH, WEST PAPUA: Rattan Camp [3°30'S 139°09'E], 1200 m, 18.II.1939, leg. L. J. Toxopeus.

Paratypes 5♀, 3♂ (1/10-8/10) NCB-RMNH, WEST PAPUA: Rattan Camp [3°30'S 139°09'E], 1200 m, 18.II.1939, leg. L. J. Toxopeus; 1♂ (9/10) ZSM, West

Papua, Jajawijaja-Prov., Anggruk, Tanggeam [4°16'S 139°24'E], 1500-1800 m, 28.-29.IX.1991, leg. A. Riedel. 1♂ larva [?] (10/10) NCB-RMNH, WEST PAPUA: Rattan Camp [3°30'S 139°09'E], 1200 m, 18.II.1939, leg. L. J. Toxopeus.

Derivatio nominis: Patronymic. The species is named after an outstanding orthopterologist Cornelis Willemse.

Measurements, holotype ♂: Pronotum length 6.37 mm, pronotum lobe width 5.2 mm, pronotum height 3.8 mm, postfemur length 6.5 mm, postfemur width 2.73 mm, vertex width 1.12 mm, eye width 0.44 mm. Paratypes ♀♀: Pronotum length 6.76-7.54 mm, pronotum lobe width 5.85-5.98 mm, pronotum height 3.8-4.29 mm, postfemur length 6.89-7.54 mm, postfemur width 2.86-3.12 mm, vertex width 1.12-1.3 mm, eye width 0.42-0.54 mm. Paratypes ♂♂: Pronotum length 5.98-6.5 mm, pronotum lobe width 4.55-5.2 mm, pronotum height 2.8-3.64 mm, postfemur length 5.2-6.24 mm, postfemur width 2.08-2.6 mm, vertex width 0.96-1 mm, eye width 0.46-0.5 mm.

Description, holotype ♂: Rather small micropronotal and wingless species. Fastigium nearly reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the Vertex not lower than the posterior half. Fossulae deep. Vertex nearly 2.5x broader than an eye. Lateral and secondary carinae nearly u-shaped, not reaching the median carina. Lateral carinae curved strongly inwards. Secondary carinae almost obsolete. Medial carina existing only as a short elevation at the anterior margin in transition to the frontal costa, not visible in lateral view. Frontal costa not elevated. Fascial carinae in lateral view arched before the antennae. Scutellum in frontal view moderately broad. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum in lateral view with one elevation in the anterior half and two lateral elevations above the middle femora. The first elevation starts at the posterior end of the prozona. The increase of the elevation, in lateral view, is concave. The median carina not increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona in lateral view slightly increasing to the anterior border. Prozonal carinae longer and straight. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally, slightly rounded. Pronotal process extending behind the middle of the hind femora, the apex, seen from above, truncated and slightly sulcated in the middle. Flight organs absent. The dorsal margin of the 8 tergite without one broader tubercle in the middle. Dorsal and ventral margin of the anterior and middle femora with lobes, middle femora ventral with hairs. Second segment of tarsus short. Hind femora moderately stout (2.7x longer than wide). The dorsal and median external area and the ventro-external carina with some rounded elevations. brown with a light antegenicular band. Genicular teeth small and rounded. Antegenicular teeth large, broad and acute. Last article of the tarsi nearly as long as the first. First and second pulvilli very short, the first nearly absent. The third pulvilli as long as the sum of the first and second. All pulvilli acute. All paratypes with the same characteristics. The male a little smaller. The paraproctum of the genital with two curved titillators. The apex of the titillators broadly obtuse.

Differential diagnosis: Specific for *Gestroana willemsei* is the concave increase of the anterior elevation of the pronotum in lateral view.

Distribution: Two localities in the mountains of the Jayawijaya Province.

***Gestroana yapenensis* sp. nov.** (Plate 74, fig 8, plate 76, fig 7, plate 78, fig 7)

Holotype ♀ BMNH, WEST PAPUA: Japen, Central Range, Mt. Oud, Camp 3, 3500 ft, XI.1938, leg. L. E. Cheesman.

Derivatio nominis: The species is named after the type locality the island of Yapen.

Measurements: Pronotum length 5.59 mm, pronotum lobe width 4.16 mm, pronotum height 2.34 mm, postfemur length 4.42 mm, postfemur width 1.82 mm, vertex width 1.06 mm, eye width 0.4 mm.

Description: Rather small micropronotal species with a narrow and rounded apex of the pronotum. Fastigium not reaching the frontal margin of the eyes, the anterior border nearly straight. Anterior half of the vertex a little lower than the posterior half. Fossulae moderately deep. Vertex more than 2x broader than an eye. Lateral and secondary carinae nearly u-shaped, not reaching the median carina. Lateral carinae short. Secondary carinae approximately obsolete. Medial carina and frontal costa above the fascial carinae absent.

Fascial carinae, in lateral view, arched before the antennae. Scutellum in frontal view moderately broad, circular. Fascial carinae above the scutellum narrow and straight. Furcation of the frontal costa slightly above the superior ocelli. Superior ocelli in line of the lower margin of the eyes. Eyes subcircular, their dorsal margin not extending above the fastigium. Eyes not touching the anterior margin of the pronotum. Antennae inserted about 1x deeper than the diameter of an antennal groove below the lower margin of the eyes. Pronotum, in lateral view, with one elevation in the anterior half and two lateral elevations above the middle femora. The first elevation starts a little behind the posterior end of the prozona. The median carina slightly increasing posteriorly. Some smaller humps on the pronotum. Anterior border of the pronotum straight. Median carina in the prozona almost absent. Prozonal carinae short and straight. Humeral angles, interhumeral carinae and internal lateral carinae absent. Infrascapular area narrow, reaching the end of the pronotum. Lateral lobes strongly curved laterally, rectangular. Pronotal process extending to the start of the knee, the apex seen from above narrow and rounded. Flight organs absent. The dorsal margin of the 9. tergite without any tubercles. Ventral margin of the anterior and middle femora with 2-3 longer lappets, the dorsal margins undulated. Middle femora ventral without short hairs. Second segment of tarsus short. Hind femora stout (2.4x longer than wide). The dorsal and median external area with some rounded elevations. The ventral margin of the hind femora with small lobes. Hind tibia consistently brownish. Genicular teeth medium sized and acute. Antegenicular teeth relatively large and acute. Last article of the tarsi nearly as long as the first. First and second pulvilli short and obtuse, the third obtuse pulvilli as long as the sum of first and second.

Differential diagnosis: Characteristic for *Gestroana yapenensis* are the long lappets on the ventral margin of the anterior and middle femora (like *Gestroana pannosa* sp. nov.). Specific is the absence of the medial carina.

Distribution: Only found in the mountains of the island of Yapen.

Key to species of *Gestroana* Berg, 1900

1 Antennae inserted 2x deeper than the diameter of an antennal groove below the lower margin of the eyes ... *Gestroana kleukersi* sp. nov.
- Antennae inserted 1x deeper as the diameter of an antennal groove under the lower margin of the eyes ... 2

2 Apex of the pronotal process seen from above curved broadly concave ... 3
- Apex of the pronotal process seen from above nearly straight or slightly notched or emarginated or rounded ... 5

3 Large humps on the outside of the hind femora ... *Gestroana cyclopensis* sp. nov.
- Only small tubercles on the outside of the hind femora ... 4

4 Elevation of the pronotal crest starts at the anterior margin of the pronotum ... *Gestroana discoidea* (Bolívar, 1898)
- Elevation of the pronotal crest starts at the posterior end of the prozona ... *Gestroana karimuiensis* sp. nov.

5 Anterior and middle femora ventral with 2-3 long lappets ... 6
- Anterior and middle femora ventral with smaller lobes or undulated ... 8

6 Apex of the pronotal process seen from above narrow and rounded ... *Gestroana yapenensis* sp. nov.
- Apex of the pronotal process seen from above broader and not rounded ... 7

7 Apex of the pronotal process seen from above slightly concave ... *Gestroana pannosa* sp. nov.
- Apex of the pronotal process seen from above straight with a triangularly furcation in the middle ... *Gestroana morobensis* sp. nov.

8 Middle and posterior third of the dorsal margin of the infrascapular area straight. ... *Gestroana bayerriveriensis* sp. nov.
- Middle and posterior third of the dorsal margin of the infrascapular area straight, at least partial arched or undulated ... 9

9 Antegenicular teeth distinctly large and like a lappet, nearly 2x broader than the Genicular teeth ... 10
- Antegenicular teeth small, nearly as broad as the Genicular teeth ... 12

10 Pronotum in lateral view with two elevations; between the elevations a u-shaped depression ... *Gestroana sedlaceki* sp. nov.

- Pronotum in lateral view with one elevation in the anterior half; in the posterior half flattened or slightly increasing 10
10 Median carina in lateral view in the posterior half undulated and increasing .... *Gestroana mounthagensis* sp. nov.
- Median carina in lateral view in the posterior half flattened 11
11 Elevation of the median carina and the lateral elevations as three separate elevations .... *Gestroana moanemaniensis* sp. nov.
- Elevation of the median carina and the lateral elevations as one connected elevation .... *Gestroana willemsei* sp. nov.
12 In lateral view the pronotum with two nearly identical high elevations .... *Gestroana bicristulata* (Günther, 1938)
- In lateral view the pronotum with two elevations, the posterior dinsticly lower than the anterior elevation 13
13 Outside of the hind femora with several rounded elevations..................................... *Gestroana flasbarthi* sp. nov.
- Outside of the hind femora with only one elevation .... *Gestroana gressitti* sp. nov.

***Holoarcus* Hancock, 1909**

Type species: *Holoarcus altinotus* Hancock, 1909.

Holoarcus altinotus is a valid species and *Holoarcus* Hancock, 1909 is a valid genus. Hancock established the genus with the type species *Holoarcus altinotus* and included *Piezotettix arcuatus*, Haan, (= *Holoarcus arcuatus* (Haan, 1842)) and *Piezotettix sulcatus* (Stål, 1877) (= *Piezotettix sulcatus* (Bolívar, 1887) comb. nov.) in this new genus. *Holoarcus arcuatus* belongs to this genus and in this paper I allocate *Piezotettix sulcatus* again as part of the genus *Piezotettix* Bolívar, 1887. Günther (1934) synonymized *Holoarcus* Hancock, 1909 with *Dolatettix* Hancock, 1907 but in 1979 he again split them up in *Dolatettix* Hancock, 1907 and *Holoarcus* Hancock, 1909. Otte (1997) declares *Holoarcus* Hancock, 1909 as a synonym of *Dolatettix* Hancock, 1907 and *Holoarcus altinotus* as a synonym of *Holoarcus arcuatus*. Both allocations are not correct, since both are valid genera and valid species as Günther (1979) had already stated. According to my research I concede with Günther's allocations.

Diagnosis: *Holoarcus* Hancock, 1909 is well characterized by the foliaceous pronotal crest. The smaller species of *Dolatettix* Hancock, 1907 are distinguished from *Holoarcus* Hancock, 1909 in lateral view by a very clearly visible frontal horn (plate 71 fig. 7). *Hymenotes* Westwood, 1837 and *Hypsaeus* Bolívar, 1887 have in lateral view a typical triangular pronotum. *Piezotettix* Bolívar, 1887 and *Boczkitettix* gen. nov. have a nearly tectiform pronotum with an unforked dorsal margin.

Distribution: Six species found on New Guinea and adjacent isles (Aru, Misool).

***Holoarcus altinotus* Hancock, 1909** (Plate 80 figs 1-3)

Holotype ♀ OUMNH, WEST PAPUA: Aru, leg. Wallace.

Differential diagnosis: The dorsal line of the pronotum is not undulated anywhere, in its highest part flattened and not rounded.

Distribution: Only found on Aru Islands.

***Holoarcus arcuatus* (Haan, 1842)** (Plate 80 figs 4-9)

Lectotype ♀ OUMNH, [WEST PAPUA] NEW GUINEA.

The lectotype specimen has a type-label and I designate it as the Lectotype. A label with further information is lost.

Paralectotype ♂ (1/1) NCB-RMNH, [WEST PAPUA]: N. Guinea, leg. Muller.

Haan describes in his paper a male and a female from New Guinea (leg. Müller). According to my research the specimens must have been collected in 1828 by Salomon Müller in Lobo (3°45'S 134°07'E). I designate these specimens as lectotype and paralectotype.

Additional material: WEST PAPUA: 3♀, 2♂ NCB-RMNH, N. Guinea, leg. Muller; 1♂ BPBM, S. Geelvink Bay, Nabire [3°22'S 135°28'E], 10-15 m, 1.-5.IX.1962, leg. J. Sedlacek; 1♂ BPBM, S. Geelvink Bay, Nabire [3°22'S 135°28'E], 0-30 m, 2.-9.VII.1962, leg. J. L. Gressitt; 2♂ BPBM, Vogelkop, Bomberi, 700-900m, 10.VI.1959, leg. T. C. Maa; 1♀ BPBM, Vogelkop, Bomberi, 700-900 m, 7.VI.1959, leg. T. C. Maa; 1♀ BPBM, Vogelkop, S.coast of Bomberai, Fak Fak [2°55'S 132°18'E], 10-100 m, 11.VI.1959, leg. J. L. Gressitt; 2♂ NCB-RMNH, Etnabaai: 15. + 24.XI.1939, Nieuw Guinea Exp. K.N.A.G. 1939; 1♂ NCB-RMNH, Gariau en Lake Jamoer (3°38'S 135°01'E), 10.XII.1954, leg. L. D. Brongersma.

Synonymy: Bolívar (1887) examined the type specimen of *Choriphyllum granulatum* Costa, 1864 (Nr. 1688) of the museum of Naples and synonymized it with *Holoarcus arcuatus*. It is uncertain where the specimen of *Choriophyllum granulatum* orignated from and whether it is in fact a synonym. Unfortunately, I did not have the opportunity to review this particular specimen.

Differential diagnosis: Haan's drawing

shows an exactly rounded pronotum without any indentations. The drawing completely matches the types that I reviewed. The pronotum that is evenly rounded along its entire length makes this type clearly identifiable among the so far known species.
Distribution: Found in the west of West Papua.

***Holoarcus belingae* (Günther, 1929)** (Plate 80 fig. 13)
Holotype ♂ ZMHU, PAPUA NEW GUINEA: Neu-Guinea [Madang Prov., Astrolabe Bay (5°30'S 145°30'E)], 11.VII.[1896], leg. S. Lauterbach (DORSA: BxdolbelPM1).
Note: The specimen is labelled as allotype. According to Günther's description this specimen is the holotype.
Paratype (Allotype) ♀ ZMHU, PAPUA NEW GUINEA: Neu-Guinea [Madang Prov., Astrolabe Bay], Fl[uss]. A, B. 742, 2. Lager, Hochwald [5°30'S 145°30'E], 24.VI.1896, Kaiser-Wilhelmsland-Expedition, leg. S. Lauterbach (DORSA: BxdolbelHTF).
Note: The specimen is labelled as the (holo)type. According to Günther's description this specimen is the allotype.
Paratypes 1♀ ZMHU, PAPUA NEW GUINEA: Neu-Guinea [Madang Prov., Astrolabe Bay], Ssiganu Janu, Hochwald [5°30'S 145°30'E], 600 m, 13.VI.1896, Kaiser-Wilhelmsland-Expedition, leg. S. Lauterbauch; 1♂ ZMHU, PAPUA NEW GUINEA: Neu-Guinea [Madang Prov., Astrolabe Bay], Fl[uss]. A, 2. Lager, Hochwald [5°30'S 145°30'E], 27.VI.1896, Kaiser-Wilhelmsland-Expedtion, leg. S. Lauterbach (DORSA: BxdolbelPM2); 1♂ larva ZMHU, PAPUA NEW GUINEA: Neu-Guinea [Madang Prov., Astrolabe Bay (5°30'S 145°30'E)], 22.VII.1896, Kaiser-Wilhelmsland-Expedition, leg. S. Lauterbach.
This specimen bears a paratype label, but Günther does not designate it as a paratype in his paper.
Additional material: PAPUA NEW GUINEA: 1♂, 1♂ larva ANIC, [Madang Prov.], Alexishafen-Matuka rd. nr. Madang, 1.VI.1967, leg. R. E. & R. M. Blackith; 1♀ ANIC, [Madang Prov.], Madang [5°13'S 145°48'E], 4.XI.1961, leg. H. L. Carson; 1♂ BPBM, [Madang Prov.], Madang [5°13'S 145°48'E], 5 m, leg. J. L. Gressitt; 1♂ ZSM, [West Sepik Prov.], Vanimo, 25B [2°41'S 141°18'E].

Distribution: The type specimens found at the east coast of Papua New Guinea. There is one additional specimen found at Vanimo in the West Sepik Province.

***Holoarcus ferwillemsei* (Willemse, 1932) nom. nov.** (Plate 80 figs 10-12, plate 81 figs 1-3)
Piezotettix truncata Willemse, 1932 [description].
Holoarcus belingae (Günther, 1929) [Willemse (1933): synonymy].
Holotype ♂ IRSNB, WEST PAPUA: Siwi [1°30'S 134°02'E], 8.III.1929, leg. Prince Léopold.
Paratypes 1♀ IRSNB, WEST PAPUA: Siwi [1°30'S 134°02'E], 8.III.1929, leg. Prince Léopold; 1♀ NHME, WEST PAPUA: Sakoemi [2°12'S 133°21'E], 12.III.1929, leg. Prince Léopold.

Derivatio nominis: Patronymic. This species is named after the famous orthopterologist and very helpful friend Fer Willemse (1927-2009), the son of Cornelis Willemse.
Cornelis Willemse named this species as *Piezotettix truncata* in 1932. 1933 he synonymized this species with *Holoarcus belingae*. But he made two mistakes: it was a good species and not a synonym of *Holoarcus belingae* and he did not notice that Hancock (1909) already described another species named *Piezotettix truncatus* from Misool. *Holoarcus truncatus* from Willemse must be renamed as a secondary homonym after art. 57.3. of the International Code of Zoological Nomenclature (Kraus 2000).
Differential diagnosis: The posterior part of the pronotum from *Holoarcus ferwillemsei* is steeply sloping and undulated. This species is related to *Holoarcus belingae* (Günther, 1929) but the dorsal margin of the pronotum until the posterior angle is not completely rounded. In lateral view it is tectiform with a distinct angle in the middle. Günther (1979) synonymized this species and *Holoarcus intermedius* (Willemse, 1932) with *Holoarcus belingae* but this was wrong.
Distribution: Found on the Vogelkop peninsula.
Note: One paratypic specimen of *Piezotettix truncatus* designated from Willemse (1932) did not belong to *Holoarcus ferwillemsei*: this specimen has pronotum rounded to the posterior end.

***Holoarcus intermedius* (Willemse, 1932) comb. nov.** (Plate 81 figs 4-9)
Piezotettix intermedia Willemse, 1932 [description].
Holoarcus intermedius (Willemse, 1932) [Willemse (1933): new combination].
Dolatettix intermedius (Willemse, 1932) [Günther (1938 a): new combination].
Holotype ♂ IRSNB, WEST PAPUA: Manoi, 2.III.1929, leg. Prince Léopold.
Paratypes 2♀, 1♂ IRSNB, WEST PAPUA: Manoi, 2.III.1929, leg. Prince Léopold; 1♀ NHME, WEST PAPUA: Manoi, 2.III.1929, leg. Prince Léopold.
Additional material: WEST PAPUA: 3♀, 2♂ NHME, Sorong, Kamp Bawe, 24.X.1948, leg. M. A. Lieftinck; 3♀, 1♂ NCB-RMNH, Sorong, Kamp Bawe, 24.X.1948, leg. M. A. Lieftinck; 1♀ NHME, Sorong, Malano, 2.IX.1948, leg. M. A. Lieftinck; 1♂ NHME, NW Guinea, Klamono

Oilfields [1°10'S 131°30'E], 18.VIII-24.VIII.1948, leg. M. A. Lieftinck; 1♀ OUMNH, New Guinea, N., leg. Wallace; 1♀ OUMNH, New Guinea, M., leg. Wallace; 1♀ OUMNH, Salawatti, ex. Coll. Leiden; 1♀ ZSM, Sorong-Prov., Kec. Salawatti, Walir Isl. [=Waiji Isl.], Kalobo, 0-20 m, 20.X.1996, leg. A. Riedel.

Differential diagnosis: The species has a foliaceous pronotum and belongs to *Holoarcus* Hancock, 1909, not to *Piezotettix* Bolívar, 1887 with its more tectiform pronotum. It is not a *Dolatettix*-species because a frontal horn is absent. *Holoarcus intermedius* is easy to identify, in lateral view, by the concave emargination at the posterior end of the pronotum.
Distribution: Only found in the west of West Papua.
Note: The pronotum in lateral view of the 3♀ from OUMNH is more flattened in the middle.

***Holoarcus truncatus* (Hancock, 1909) comb. nov.** (Plate 81 figs 10-12)
Piezotettix truncatus Hancock, 1909 [description].
Holotype ♂ OUMNH, WEST PAPUA: Mysol, leg. Wallace.

Hancock designated one female (leg. Wallace) as the type specimen from Morotai Island. The type specimen in OUMNH is from Misool (leg. Wallace) and it is a male.
Even an intensive search in OUMNH collection did not produce any specimen from Morotai Island. Hancock's diagnosis corresponds exactly with the examined specimen. Therefore I assume that the holotype is the female of Misool and I labelled it accordingly.
Differential diagnosis: Pronotum rounded like *Holoarcus arcuatus*. At the posterior apex is a small incision.
Distribution: Only found on the island of Misool.

Key to species of *Holoarcus* Hancock, 1909

1 Dorsal line of the pronotum not emarginated anywhere, not even in front of the posterior apex 2
- Dorsal line of the pronotum undulated or emarginated in the posterior part 3
2 Dorsal line of the pronotum in the middle part flattened .... *Holoarcus altinotus* Hancock, 1909
- Dorsal line of the pronotum all over rounded .... *Holoarcus arcuatus* (Haan, 1842)
3 Posterior part of the pronotum rounded; only the end undulated or emarginated but not steeply sloping 4
- Posterior part of the pronotum steeply sloping 5
4 Dorsal line of the pronotum in the middle part all over rounded .... *Holoarcus belingae* (Günther, 1929)
- Dorsal line of the pronotum in the middle part with a distinct angle .... *Holoarcus ferwillemsei* (Willemse, 1932) nom. nov.
5 Posterior part of the pronotum slightly undulated with a concave emargination .... *Holoarcus intermedius* (Willemse, 1932) comb. nov.
- Only a small emargination before the posterior apex of the pronotum .... *Holoarcus truncatus* (Hancock, 1909) comb. nov.

***Hymenotes* Westwood, 1837**
Type species: *Hymenotes triangularis* Westwood, 1837.
Distribution: This genus is only found on the Philippines.

***Hymenotes triangularis* Westwood, 1837**
Type MNMS: PHILLIPINES.

Note: *Hymenotes bolivari* Kirby, 1910 is a synonym (Günther 1938a).

***Hypsaeus* Bolívar, 1887**
Type species: *Hypsaeus westwoodi* Bolívar, 1887.

***Hypsaeus westwoodi* Bolívar, 1887** (Plate 70 figs 7-9)
Holotype ♂ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12918).

***Ichikawatettix* gen. nov.**
Type species: *Ichikawatettix exsertus* (Günther, 1938) **comb. nov.**
Derivatio nominis: Patronymic. The genus is named after Akihiko Ichikawa, a famous Japanese orthopterologist.
Description: The eyes of the *Ichikawatettix*-species are exerted or strongly exerted above the pronotum. *Ichikawatettix* gen. nov. is allocated to the Cladonotinae because the scutellum is widened. All species are miropronotal and have no wings. The short antenna inserted below the lower

margin of the eyes.
Differential diagnosis: *Ichikawatettix exsertus* (Günther, 1938) as the new genotype of *Ichikawatettix* gen. nov. is described by Günther (1938b) and assigned by him to *Amphinotus* Hancock, 1915. The genotype from *Amphinotus* Hancock, 1915 is *Amphinotus pygmaeus* Hancock, 1915 from Ceylon. The eyes of *Amphinotus pygmaeus* are not extending above the pronotum and the scutellum is not specifically widened (see the drawings by Hebard, 1932). Günther (1979) stated, the known species of *Amphinotus* Hancock, 1915 must be distributed to several genera. *Ichikawatettix* gen. nov. is related to some species of *Amphinotus* Hancock, 1915 and might be a different genus of Metrodorinae. Further research is required to determine the correct relationship.
Distribution: Only known from New Guinea.

***Ichikawatettix detzeli* sp. nov.** (Plate 82, figs 1-3)
Holotype ♂ BPBM, WEST PAPUA: Bodem, 11 km SE of Oerberfaren [1°58'S 138°44'E], 100 m, 7.-17.VII.1959, leg. T. C. Maa.

Derivatio nominis: Patronymic. The species is named after Peter Detzel, a German orthopterologist and long time chairman of the German Society for Orthopterology.
Measurements: Pronotum length 3.9 mm, pronotum lobe width 2.9 mm, pronotum height 1.25 mm, postfemur length 4.45 mm, postfemur width 1.3 mm, vertex width 0.66 mm, eye width 0.4 mm.
Description: Small wingless and micropronotal species. Head with half of the eyes exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae curved inwards and running rounded downwards from the supraocular lobes to the medial carina but not reaching her. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, arched but not reaching the frontal margin of the eyes and going down with a right angle and run over into the frontal costa. Fossulae moderately deep. Frontal costa in lateral view not projected before the eyes. Fascial carinae in lateral view flat projected before the antenna. Scutellum in frontal view moderately broad, gradually widened ventrad. Furcation of the frontal costa short over the superior ocelli, a little over the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin extending above the fastigium. Antennae short. Upper margin of the antennal grooves more than one width of the antennal grooves below the lower margin of the eyes. Pronotum rugose with small tubercles and some flat depressions. Median carina extending to the anterior border, in the anterior half slightly increasing cephalad and arched in line of the lateral lobes. Prozonal carinae short and curved a little outwards behind. Humeral angles and interhumeral carinae absent. Infrascapular area with a larger black spot between the mid-coxa and the hind femur. Internal lateral carinae absent. Lateral lobes of the paranota rounded with a right angle, strongly curved laterally. Pronotal process not reaching the middle of the hind femora, broadly rounded. Tegmen and hind wings absent. Anterior femora ventral with two small lappets. The middle femora undulating. The second segment of the tarsus short. Hind femora slender (3.5x longer than wide). Genicular- and antegenicular teeth small. The ventro-external carina with one small lappets curved laterally. Posttibia brown with one white bands at the upper margin. Pulvilli acute. Colour light brown with some black parts. Only with some very short hairs.
Differential diagnosis: *Ichikawatettix detzeli* is not hairy like the other two species. Further differences to the other two species are: the hind femur is slender; the fastigium, in frontal view, is smaller between the eyes and the scutellum is gradually widened ventrad.
Distribution: Only known in the same region as *Ichikawatettix kleinertae* sp. nov. near Bodem at the northern coast of West Papua.

***Ichikawatettix exsertus* (Günther, 1938) comb. nov.** (Plate 82 figs 4-9)
Amphinotus exsertus Günther, 1938 [description].
Holotype ♀ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.] Etappenberg (Nr. 201) [4°38'S 142°28'E], 850 m, 2.-5.XI.1912 (leg. S. G. Bürgers).
Additional material: 1♂ ZMHU PAPUA NEW GUINEA: [East Sepik Prov.] Etappenberg (Nr. 203) [4°38'S 142°28'E], 13.-16.XI.1912 (leg. S. G. Bürgers); 1♂ larva ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.] Lordberg (Nr. 215) [4°50'S 142°29'E], 29.-30.XI.1912 (leg. S. G. Bürgers); 1♀ BPBM, PAPUA NEW GUINEA: [West Sepik Prov.], Samoro (big leaf herb melastoma) [3°45'S 142°05'E], 1100 m, 11.V.1975, leg. J. L. Gressitt.

Measurements, holotype ♀: Pronotum length 4 mm, pronotum lobe width 3.04 mm, pronotum height 1.8 mm, postfemur length 4.72 mm, postfemur width 1.68 mm, vertex width 0.82

mm, eye width 0.5 mm. ♂ ZMHU: Pronotum length 3.92 mm, pronotum lobe width 2.88 mm, pronotum height 1.7 mm, postfemur length 4.5 mm, postfemur width 1.7 mm, vertex width 0.7 mm, eye width 0.52 mm. ♀ BPBM: Pronotum length 3.84 mm, pronotum lobe width 3.12 mm, pronotum height 1.75 mm, postfemur length 4.8 mm, postfemur width 1.52 mm, vertex width 0.9 mm, eye width 0.48 mm.

Description: The male is only a little bit smaller and corresponds in all characteristic features with the female.

Differential diagnosis: See the next species.

Distribution: Found only in the mountains of the upper Sepik River system.

***Ichikawatettix kleinertae* sp. nov.** (Plate 82 figs 10-15)

Holotype ♀ BPBM, WEST PAPUA: Bodem, 11 km SE of Oberfaren [1°58'S 138°44'E], 100 m, 7.-17.VII.1959, leg. T. C. Maa.

Paratype 1♂ BPBM, WEST PAPUA: Bodem, 11 km SE of Oerberfaren [1°58'S 138°44'E], 100 m, 7.-17.VII.1959, leg. T. C. Maa, in ZFMK.

Derivatio nominis: Patronymic. The species is named after Heidrun Kleinert, a German orthopterologist, who built up the German Orthopterologist Society.

Measurements, holotype ♀: Pronotum length 3.15 mm, pronotum lobe width 2.6 mm, pronotum height 1.5 mm, postfemur length 3.4 mm, postfemur width 1.3 mm, vertex width 0.52 mm, eye width 0.38 mm. Paratype ♂: pronotum length 2.95 mm, pronotum lobe width 2.4 mm, pronotum height 1.1 mm, postfemur length 3.1 mm, postfemur width 1.1 mm, vertex width 0.52 mm, eye width 0.34 mm.

Description, holotype ♀: Very small wingless and micropronotal species with a hairy body. Head with half of the eyes exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium slightly rounded, curved back to the medial carina. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved inwards. Medial carina in the posterior part absent, initiated in line of the supraocular lobes, arched and projected until the frontal margin of the eyes. Fossulae small and moderately deep. Frontal costa in lateral view not projected before the eyes. Fascial carinae in lateral view arched before the antenna. Scutellum in frontal view broad. Furcation of the frontal costa short over the superior ocelli, a little over the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin extending a little above the fastigium. Antennae short. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum with tubercles and some flat depressions. Median carina extending to the anterior border, undulating and arched in line of the lateral lobes. Prozonal carinae short and curved a little outwards behind. Humeral angles and interhumeral carinae absent. Infrascapular area with a concave part posterior. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process reaching the middle of the hind femora, truncated and triangularly sulcate. Tegmen and hind wings absent. Anterior and middle femora at the ventral margin with two small lappets and numerous short hairs. The second segment of the tarsus short. Hind femora moderately stout (2.5x longer than wide). Genicular teeth small. Antegenicular teeth smaller than Genicular teeth. Posttibia brown with one white band at the upper margin. Pulvilli acute. Colour brown with some light parts. All parts of the body, pronotum and legs covered with short hairs. The male is identical with the female but a little smaller.

Differential diagnosis: *Ichikawatettix kleinertae* is smaller than the other two species. The hairy body and the hind femur are like *Ichikawatettix exsertus*. But the antennal grooves are closer to the dorsal margin of the eyes.

Distribution: Only known near Bodem at the northern coast of West Papua.

Key to species of *Ichikawatettix* gen. nov.

1 Antennal grooves at least one diameter below the lower margin of the eyes 2
- Antennal grooves under one diameter below the lower margin of the eyes .... *Ichikawatettix kleinertae* sp. nov.
2 Pronotal process rounded posteriorly .... *Ichikawatettix detzeli* sp. nov.
- Pronotal process sulcate posteriorly .... *Ichikawatettix exsertus* (Günther, 1938)

***Ingrischitettix* gen. nov.**

Type species: *Ingrischitettix mountalbilalaensis* sp. nov.

Derivatio nominis: Patronymic. The genus is named after Sigfrid Ingrisch, a fabulous German orthopterologist.

Description: Medial carina in the frontal section going upwards and rounded over and before the eyes. Transverse carinae u-shaped, not reaching the median carina. Scutellum widened, the fascial carinae a long distance parallel. Pronotum tectiform. Internal lateral carinae absent. Flight organs absent. Lateral lobes slightly curved laterally. Second segment of tarsus of the anterior femora and middle femora extended. Ventro-external carinae of the hind femur with to small lappets curved laterally.

Differential diagnosis: I am not aware of any other genus from New Guinea or South-East Asia similar to *Ingrischitettix* gen. nov. yet. *Ingrischitettix* gen. nov. comes most closely to the South- and Central-American genus *Metrodora* Bolívar, 1887. Especially the elevated tip of the fastigium, the tectiform pronotum and the U-shaped transverse carinae resembles *Ingrischitettix* gen. nov. on *Metrodora* Bolívar, 1887. But they have the following differences: in *Ingrischitettix* gen. nov. the internal lateral carinae are absent, the lateral lobes are small, rounded and slightly curved laterally. In *Metrodora* Bolívar, 1887 they are strongly curved laterally and often are spinose. The upper margin of the antennal grooves in *Ingrischitettix* gen. nov. is in line with the lower margin of the eyes and not as deep as in *Metrodora* Bolívar, 1887.

Distribution: Only known from the Mt. Albilala of Finisterre Range, New Guinea.

***Ingrischitettix mountalbilalaensis* sp. nov.** (Plate 84 figs 1-6)

Holotype ♂ BPBM, PAPUA NEW GUINEA: Morobe Prov., Finisterre Mts., Mt. Abilala, stn. no. 102, c. 9000 ft, 19.-22.XI.1964, leg. M. E. Bacchus.

Paratypes 1♀ (1/3), 1♂ (2/3) BPBM, PAPUA NEW GUINEA: Morobe Prov., Finisterre Mts., Mt. Abilala, stn. no. 102, c. 9000 ft, 19.-22.XI.1964, leg. M. E. Bacchus, 1 ♂ (2/3) is deposited in ZFMK; 1♀ larva (3/3) BPBM, PAPUA NEW GUINEA: Morobe Prov., Finisterre Mts., Mt. Abilala, stn. no. 102, c. 9000 ft, 19.-22.XI.1964, leg. M. E. Bacchus.

Derivatio nominis: The species is named after the type locality.

Measurements, holotype ♂: Pronotum length 5.36 mm, pronotum lobe width 2.72 mm, pronotum height 2.08 mm, postfemur length 1.52 mm, postfemur width 4.32 mm, vertex width 0.9 mm, eye width 0.3 mm. Paratype 1/2 ♀: Pronotum length 5.56 mm, pronotum lobe width 3.04 mm, pronotum height 2.48 mm, postfemur length 4.8 mm, postfemur width 1.84 mm, vertex width 0.92 mm, eye width 0.4 mm. Paratype 2/2 ♂: Pronotum length 4.72 mm, pronotum lobe width 2.64 mm, pronotum height 2.08 mm, postfemur length 4.4 mm, postfemur width 1.52 mm, vertex width 0.82 mm, eye width 0.42 mm.

Description, holotype ♂: Rather small wingless and brachypronotal species with a tectiform pronotum. Head lower than the fastigium and pronotum. Fastigium projecting before and above the eyes, in lateral view rounded. Anterior border in dorsal view a little projected before the eyes. Vertex slightly convex with relatively deep fossulae, 2x broader than an eye. Transverse and lateral carinae u-shaped, not reaching the median carina and in lateral view visible above the eyes. Medial carina beginning in line with the supraocular lobes, strongly elevated above and before the eyes. Frontal costa in lateral view not projected before the eyes. Fascial carinae, in lateral view, flattened arched and projected before the antenna beginning a little over the ventral margin of the eyes. Furcation of the frontal costa, in frontal view, started in line with the middle of the eyes a litte above the superior ocelli. Superior ocelli in line with the lower third of the eyes. Scutellum relatively long and narrow, a little broader than an antennal groove. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes almost touching the anterior margin of the pronotum. Upper margin of the antennal grooves in line with the lower margin of the eyes. Flagellum of the antennae with 13 articles. Pronotum tectiform, coarse, the anterior border straight. Median carina arched and extending to the anterior border. Prozonal carinae curved outwards towards the anterior border. Interhumeral carinae distinct. Infrascapular area, with an undulated dorsal margin reaching the apex of the pronotum, narrow posteriorly. Internal lateral carinae absent. Lateral lobes curved laterally, broadly rounded. Pronotal process, seen from above, trapezoidal. Tegmen and wings absent. Anterior and middle femora relatively slender, the dorsal margin undulated. Middle femora dorsal without hairs. Second segment of the tarsus slightly extended. Hind femora moderately slender (2.6-2.8x longer than wide), dorsal margin in dorsal view undulated. The ventral margin of the hind femur with one small lappet in the middle. Dorso- and ventro-external carina

without projections. Hind tibia with a light band in the upper half. Genicular- and antegenicular teeth small. Last article of the tarsi half the length of the first. First and second pulvilli very small and acute. The female is only a little bigger and corresponds in all characteristic features with the male.
Distribution: Only known from the Mt. Albilala of Finisterre Range, New Guinea.

Misythus **Stål, 1877**
Type species: *Hypsaeus westwoodi* Bolívar, 1887.
Till now, 27 species and 2 subspecies have been described. All information, descriptions of 21 new species, and an identification key are published by Hebard (1923). I took pictures of the types in NHRS.
Distribution: All species found on the Philippines.

Misythus echinatus **(Stål, 1877)** (Plate 83 figs 1-3)
Holotype ♂, NHRS: PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12925).

Misythus securifer **(Walker, 1871)** (Plate 83 figs 4-9)
= *Misythus histrionicus* Stål, 1877
Holotype ♂ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12928).
Allotype ♀ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12927).

Misythus laminatus laminatus **Stål, 1877** (Plate 83 figs 10-12)
Holotype ♂ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12931).

Nesotettix **Holdhaus, 1909**
Type species: *Nesotettix samoensis* Holdhaus, 1909.
Distribution: New Caledonia and Samoa.

Nesotettix cheesmanae **Günther, 1938**
Holotype ♀ BMNH, NEW CALEDONIA: Bourail, XII.1930, leg. L. E. Cheesman.
Distribution: Only found at the type locality on New Caledonia.

Nesotettix samoensis **Holdhaus, 1909**
Holotype ♀ NMW, SAMOA: Upolu.
Distribution: Samoa.

Paraphyllum **Hancock, 1913**
Type species: *Paraphyllum antennatum* Hancock, 1913.
Distribution: Borneo.

Paraphyllum antennatum **Hancock, 1913** (Plate 91 figs 7-9)
Holotype ♀ ANSP, MALAYSIA: Borneo, Mt. Penrissen, V.1899.

Differential diagnosis: The scutellum is only a little widened and it is doubtful that *Paraphyllum antennatum* belongs to the Cladonotinae. Together with *Stegaceps brevicornis* it is the only known South-East-Asian specimen of Cladonotinae with tegmen and long hind wings. The species looks similar to some genera of the African Xerophyllini.
Distribution: Only found at Mt. Penrissen on Borneo.

Peraxelpa **Sjöstedt, 1931**
Type species: *Peraxelpa monstrosa* Sjöstedt, 1931.
Distribution: Australia
Note: The name *Paraxelpa* used by Otte (1997) for the genus is not correct. *Peraxelpa* Sjöstedt, 1931 is the valid name for the genus given by Sjöstedt (1931). *Paraxelpa* is a wrong name.

Peraxelpa monstrosa **Sjöstedt, 1931**
Holotype ♂ QM, AUSTRALIA: Queensland, Mt. Tambourine, 28.X.1912, leg. H. Hacker.

Distribution: Only found at Mt. Tambourine in Australia.

Piezotettix **Bolívar, 1887**
Type species: *Piezotettix cultratus* (Stål, 1877).
Differential diagnosis: *Piezotettix* Bolívar, 1887 is related to *Holoarcus* Hancock, 1909 and *Dolatettix* Hancock, 1907 from New Guinea. But the leaf-like pronotum is lower and shorter at the posterior part. The pronotal process, seen from above, is broadly obtuse posteriorly and with concave parts between the median carina and external lateral carinae.
Distribution: Two species only found on the Philippines.

Piezotettix cultratus **(Stål, 1877)** (Plate 84 figs 7-9)
Holotype ♀ NHRS, PHILLIPINES: Ins. Philipp. (NRM-ORTH 12919).

Piezotettix sulcatus **(Stål, 1877) comb. nov.** (Plate 84 figs 10-15)
Hymenotes sulcatus Stål, 1877 [description]
Piezotettix sulcatus (Stål, 1877) [Bolívar (1887): new combination]

Dolatettix sulcatus (Stål, 1877) [Günther (1938a): new combination]

Holotype ♀ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12920).

Paratype 1♀ NHRS, PHILLIPINES: Ins. Philipp., leg. Semper (NRM-ORTH 12921).

Additional material: 1♀, 1♂ NCB-RMNH, PHILLIPINES: Mindanao, Surigao; 1♀ NHRS, PHILLIPINES: S.. Luzon, Albay.

***Planotettix* gen. nov.**

Type species: *Planotettix planus* **sp. nov.**

Derivatio nominis: The name refers to the flattened or extremely flattened species of this genus.

Diagnosis: *Planotettix* gen. nov. is closely related to *Eurymorphopus* Hancock, 1907. In both genera all species are small and extremely flattened. The two *Eurymorphopus*-species are brachypronotal, the *Planotettix*-species are micropronotal. In *Planotettix* gen. nov. the internal lateral carina is lost. In *Eurymorphopus* Hancock, 1907 the internal lateral carina is clearly visible. *Planotettix* gen. nov. is only found in New Guinea, meanwhile *Eurymorphopus* Hancock, 1907 is found on New Caledonia. The species of *Planotettix* gen. nov. are in comparision to the *Eurymorphopus*-species with a pronotum length of minimal 5 mm, small or very small. The pronotum length of the *Planotettix* gen. nov. is smaller than 5 mm.

Distribution: Papua New Guinea.

***Planotettix astrolabebayensis* sp. nov.** (Plate 85 fig. 1, plate 86 fig. 2, plate 87 fig. 1)

Holotype ♀ HNHM, PAPUA NEW GUINEA: [Madang Prov.], Astrolabe Bay, Erima [5°24'S 145°44'E], 1897, leg. Biró.

Derivatio nominis: The species is named after the type locality.

Measurements: Pronotum length 3.52 mm, pronotum lobe width 3.2 mm, pronotum height 0.93 mm, postfemur length 3.92 mm, postfemur width 1.26 mm, vertex width 0.48 mm, eye width 0.34 mm.

Description: Very flat and wingless species. Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Vertex concave, broader than an eye. Transverse carinae obsolete. Lateral carinae shorter, curved inwards, not reaching the medial carina. In lateral view, lateral carinae visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, arched and projected slightly before the eyes. Fossulae shallow. Frontal costa in lateral view visible before the whole eyes. Fascial carinae in lateral view slightly arched before the antenna. Scutellum in frontal view narrower, a little broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the fastigium. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum flat, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. Prozonal carinae parallel. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process short, reaching the middle of the hind femora. Seen from above, broadly truncated posteriorly, slightly rounded on each side of the median carina and notched in the middle. Tegmen and hind wings absent. Anterior and middle femora flattened and inclined to the body. The dorsal margin undulating. The ventral margin with two lappets and some very short hairs. The second segment of the tarsus short. Hind femora slender (3.1x longer than wide), slightly inclined. The ventro-external carina curved laterally, with two lappets curved laterally. The ventral external area directed downwards, coloured black. Genicular teeth very small. Antegenicular teeth small, a larger lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with two white bands. Last article of the tarsi a little longer than the first. First and second pulvilli short and acute. The third pulvilli long as the sum of the first and second. Colour brown with some lighter sections. In ventral view most body parts black.

Differential diagnosis: *Planotettix astrolabebayensis* is together with *Planotettix fartmanni* sp. nov. the only species of *Planotettix* gen. nov. where, in lateral and frontal view, lateral carinae visible above the eyes. It can be differentiated from *Planotettix fartmanni* by the absence of the spiny tubercles on the median carina.

Distribution: Only found in the Astrolabe Bay at the east cost of Papua New Guinea.

Planotettix biroi **sp. nov.** (Plate 85 fig. 2, plate 86 fig. 3, plate 87 fig. 2)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Finschhafen N. [6°36'S 147°51'E], leg. J. & M. Sedlacek.

Paratypes 3♀ (1/4-3/4) HNHM, PAPUA NEW GUINEA: [Morobe Prov.], Huon Golf, Sattelberg [6°29'S 147°46'E], 1899 (3/4 25.XI.1898), leg. Biró, 2/4 deposited in ZFMK, 3/4 deposited in NCB-RMNH; 1♀ larva (4/4) HNHM, PAPUA NEW GUINEA: [Morobe Prov.], Huon Golf, Sattelberg [6°29'S 147°46'E], 1899, leg. Biró.

Derivatio nominis: Patronymic. The species is named after collector Lajos Biró (1856-1931), a Hungarian naturalist.

Measurements, holotype ♀: Pronotum length 3.6 mm, pronotum lobe width 3.12 mm, pronotum height 1.38 mm, postfemur length 3.6 mm, postfemur width 1.35 mm, vertex width 0.58 mm, eye width 0.34 mm. Paratypes ♀♀: Pronotum length 3.6-3.92 mm, pronotum lobe width 3.2-3.36 mm, pronotum height 1.35-1.44 mm, postfemur length 4-4.24 mm, postfemur width 1.32-1.47 mm, vertex width 0.66-0.68 mm, eye width 0.34-0.38 mm.

Description, holotype ♀: Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium straight. Anterior half of the vertex a little lower than the posterior half. Fossulae deep. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae long, curved inwards, reaching the medial carina. In lateral view slightly visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the hind margin of the eyes, arched and projected slightly before the eyes. Frontal costa, in lateral view, visible before the whole eyes (in the paratypes not at all). Fascial carinae, in lateral view, slightly arched before the antenna. In frontal view the lateral carinae forming the scutellum parallel or slightly widened dorsad. Scutellum, in frontal view, a little broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above posterior part of the fastigium. Antennae short. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum flattened, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. In lateral view the median carina with two elevations. The higher one above the lateral lobes, the second one above the beginning of the hind femora. Prozonal carinae long and parallel. Infrascapular area slightly inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally and serrated. Pronotal process short, surpassing the middle of hind femora, seen from above, truncated posteriorly. The posterior margin spiny and notched in the middle. Tegmen and hind wings absent. Ventral margin of the anterior and middle femora with two lappets. The dorsal margin undulated and lamellate. The ventral margin of the middle femora with some short hairs. The second segment of the tarsus short. Hind femora moderately slender (2.7x longer than wide), slightly inclined. The ventro-external carina curved laterally, with two lappets in the middle. The dorsal external area with one distinct conical hump. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth small and spiny. A small lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with two white bands. Last article of the tarsi a little shorter than the first. Pulvilli short and acute. The third pulvilli shorter than the sum of the first and second. Colour brown with light areas and some black parts.

Differential diagnosis: The only species of *Planotettix* gen. nov. with two relatively high and arched elevations of the median carina.

Distribution: Only found at the east coast of Papua New Guinea in the region of Huon Gulf.

Planotettix buergersi **sp. nov.** (Plate 85 fig. 3, plate 86 fig. 4, plate 87 fig. 3)

Holotype ♂ ZMHU, PAPUA NEW GUINEA: [East Sepik Prov.], Quelllager [4°32'S 142°41'E], 13.-16.VIII.1912, leg. S. G. Bürgers.

Paratype 1♂ (1/1) BPBM, PAPUA NEW GUINEA: [East Sepik Prov.], Wewak [3°33'S 143°38'E], 2-20 m, 13.X.1957, leg. J. L. Gressitt, deposited in ZFMK.

Derivatio nominis: Patronymic. The species is named after the collector Dr. Bürgers. He was the doctor and zoologist of the German Kaiserin-Augusta-Fluß-Expedition (1912-1913) on the Sepik River.

Measurements, holotype ♂: Pronotum length 3.4 mm, pronotum lobe width 2.85 mm, pronotum height 1.06 mm, postfemur length 3.7 mm, postfemur width 1.3 mm, vertex width 0.46 mm, eye width 0.36 mm. Paratype ♂: Pronotum length 3.28 mm, pronotum lobe width 2.8 mm, pronotum height 0.9 mm, postfemur length 3.52 mm, postfemur width 1.14 mm, vertex width 0.44 mm, eye width 0.36 mm.

Description, holotype ♂: Head not exerted above the pronotum, inclined under the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half. Fossulae shallow. Vertex a little broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved a little inwards, not reaching the medial carina. In lateral view not visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, arched and projected slightly before the eyes. Frontal costa, in lateral view, not arched before the eyes. Fascial carinae, in lateral view, slightly arched before the antenna. Scutellum in frontal view narrow, as broad as an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the posterior part of the fastigium. Upper margin of the antennal grooves a little below the lower margin of the eyes. Pronotum very flattened, coarse with some carinulae and impressed dots. Median carina extending to the anterior border. Prozonal carinae parallel. In lateral view the median carina with two low elevations of equal height, more undulated. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process short, reaching the middle of the hind femora, seen from above, broadly truncated posteriorly slightly rounded on each side of the median carina and notched in the middle. Tegmen and hind wings absent. Anterior and middle femora flattened. The dorsal margin undulated and serrulate. The ventral margin with two lobes and some very short hairs. The second segment of the tarsus short. Hind femora slender (2.8x longer than wide). The ventro-external carina curved laterally, with two small lobes curved laterally. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth very small and acute. A small acute lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with two white bands. Last article of the tarsi as long as the first. Pulvilli small and acute. The third pulvilli as long as the sum of the first and second. In ventral view all body parts black.

Differential diagnosis: There are no special characteristics for this species. With help of the identification key of *Planotettix* gen. nov. it is possible to identify this species. Both type-specimen are differentiated by the small lobes on the ventro-external carina. The lobes of the holotype are almost absent. Maybe with further research and comparision of both sexes it could be possible to answer the question, wheather there are taxonomical differences.

Distribution: Found in the region of the Sepik River.

***Planotettix cyclopensis* sp. nov.** (Plate 85 figs 4-5, plate 86 figs 5-6, plate 87 figs 4-5)

Holotype ♂ BPBM, WEST PAPUA: Cyclops Mts., Ifar [2°34'S 140°31'E], 450-500 m, 8.IX.1962, leg. J. Sedlacek.

Paratypes 1♀, 1♂ (1/10-2/10) BMNH, WEST PAPUA: Cyclops Mts., Sabron [2°30'S 140°25'E], 930 ft, IV.1936, leg. L. E. Cheesman; 1♀ (3/10), 1♂ (4/10) BMNH, WEST PAPUA: Cyclops Mts., Sabron [2°30'S 140°25'E], Camp 1, 930 ft, VI.1936, leg. L. E. Cheesman, 4/10 deposited in HNHM; 1♀ (5/10) BMNH, WEST PAPUA: Cyclops Mts., Sabron [2°30'S 140°25'E], Camp 1, 1200 ft, VII.1936, leg. L. E. Cheesman, deposited in UCDC; 1♀ (6/10) BMNH, WEST PAPUA: Cyclops Mts., 3500 ft, III.1936, leg. L. E. Cheesman, deposited in NCB-RMNH; 1♀ (7/10) BMNH, WEST PAPUA: Cyclops Mts., Mt. Cyclops, 4500 ft, III.1936, leg. L. E. Cheesman, deposited in IRSNB; 1♂ (8/10) BMNH, WEST PAPUA: Cyclops Mts., Mt. Cyclops, 3500 ft, III.1936, leg. L. E. Cheesman, deposited in ANIC; 2♂ (9/10-10/10) BMNH, WEST PAPUA: Cyclops Mts., Mt. Lina [2°30'S 140°30'E], 3500 ft, III.1936, leg. L. E. Cheesman, 9/10 deposited in NHRS, 10/10 deposited in ZMHU.

Derivatio nominis: The species is named after the type locality, the Cyclops Mountains.

Measurements, holotype ♂: Pronotum length 3.04 mm, pronotum lobe width 2.72 mm, pronotum height 0.96 mm, postfemur length 3.52 mm, postfemur width 1.2 mm, vertex width 0.42 mm, eye width 0.36 mm. Paratypes ♀♀: Pronotum length 3.12-3.5 mm, pronotum lobe width 2.8-3.15 mm, pronotum height 1-1.1 mm, postfemur length 3.4-3.6 mm, postfemur width 1.1-1.36 mm, vertex width 0.44-0.5 mm, eye width 0.3-0.4 mm. Paratypes ♂♂: Pronotum length 2.85-3.2 mm, pronotum lobe width 2.75-2.9 mm, pronotum height 0.9-1.1 mm, postfemur length 3.2-3.5 mm, postfemur width 1-1.15 mm, vertex width 0.44-0.48 mm, eye width 0.3-0.36 mm.

Description, holotype ♂: Head not exerted above the pronotum, strongly inclined under the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half. Fossulae shallow. Vertex a little broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved a little inwards, not reaching the medial carina. In lateral view not visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the posterior margin of the eyes, arched and projected slightly before the eyes. Frontal costa, in lateral view, not arched before the eyes. Fascial carinae in lateral view slightly arched before the antenna. Scutellum in frontal view narrower, a little broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the posterior part of the fastigium. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum very flat, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. Prozonal carinae parallel. In lateral view the median carina with two low elevations of equal height, more undulated. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally and truncated posteriorly. Pronotal process short, reaching the middle of the hind femora. Seen from above, broadly truncated posteriorly slightly rounded on each side of the median carina and notched in the middle. Tegmen and hind wings absent. Anterior and middle femora flat. The dorsal margin undulating. The ventral margin with two lobes and some very short hairs. The second segment of the tarsus short. Hind femora slender (2.9x longer than wide), inclined. The ventro-external carina curved laterally, with two serrulate lobes. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth nearly absent. A medium sized lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with one white bands. Last article of the tarsi as long as the first. Pulvilli obtuse. The third pulvilli shorter than the sum of the first and second. In ventral view all body parts black. The male are a little smaller.

Differential diagnosis: There are no special characteristics for this species. With the help of the identification key of *Planotettix* gen. nov. it is possible to identify this species.

Distribution: Found in the Cyclops Mountains.

Planotettix fartmanni **sp. nov.** (Plate 85 figs 6-7, plate 86 figs 7-8, plate 87 figs 6-7)

Holotype ♀ UCDC, PAPUA NEW GUINEA: Morobe Prov., Tekadu, 7°38'S 146°34'E, I.2000, leg. T. A. Sears & binatung brigade (Malaise trap).

Paratypes 1♀ (1/6) UCDC, PAPUA NEW GUINEA: Gulf [Prov.], Ivimka Res. Station, Lakekamu Basin, 120 m, 7°44'S 146°30'E, 10.-12.II.2000, leg. T. A. Sears (Malaise trap), deposited in BMNH; 1♀ (2/6) UCDC, PAPUA NEW GUINEA: Gulf [Prov.], Ivimka Res. Station, Lakekamu Basin, 120 m, 7°44'S 146°30'E, 1.-7.III.2000, leg. T. A. Sears, deposited in NCB-RMNH; 1♂ (3/6) UCDC, PAPUA NEW GUINEA: Gulf [Prov.], Ivimka Res. Station, Lakekamu Basin, 120 m, 7°44'S 146°30'E, 19.-25.XI.2000, leg. T. A. Sears (Malaise trap), deposited in HNHM; 1♂ (4/6) UCDC, PAPUA NEW GUINEA: Gulf [Prov.], Ivimka Res. Station, Lakekamu Basin, 120 m, 7°44'S 146°30'E, 24.IV.2000, leg. T. A. Sears, deposited in ZMHU; 2♂ (5/6-6/6) UCDC, PAPUA NEW GUINEA: Morobe Prov., Tekadu, 7°38'S 146°34'E, 1.-20.IV.2000, leg. T. A. Sears & binatung brigade (Malaise trap) (5/6 deposited in ZMFK, 6/6 in BPBM).

Derivatio nominis: Patronymic. The species in named after Dr. Thomas Fartmann, the chairman of the German Society for orthopterology.

Measurements, holotype ♀: Pronotum length 4.64 mm, pronotum lobe width 3.6 mm, pronotum height 2.04 mm, postfemur length 4.96 mm, postfemur width 1.74 mm, vertex width 0.9 mm, eye width 0.4 mm. Paratypes ♀♀: Pronotum length 4.96 mm, pronotum lobe width 3.84-3.92 mm, pronotum height 1.65-1.98 mm, postfemur length 5.12-5.36 mm, postfemur width 1.65-1-86 mm, vertex width 0.92-1 mm, eye width 0.4-0.44 mm. Paratypes ♂♂: Pronotum length 3.92-4.16 mm, pronotum lobe width 3.2-3.44 mm, pronotum height 1.47-1.86 mm, postfemur length 4.4-4.48 mm, postfemur width 1.47-1.62 mm, vertex width 0.78-0.82 mm, eye width 0.4-0.44 mm.

Description, holotype ♀: Flat and wingless species. Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half. Fossulae deep. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae long, curved inwards, reaching the medial carina.

In lateral view the lateral carinae slightly visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, not projected before the eyes. Frontal costa, in lateral view, not visible before the eyes. Fascial carinae, in lateral view, arched before the antenna. Scutellum in frontal view broader. Furcation of the frontal costa at the dorsal margin of the superior ocelli. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the fastigium. Antennae short. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum flattened, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. At the anterior border a small tubercle. In lateral view the median carina with two elevations. The higher one above the lateral lobes, the second one above the beginning of the hind femora. Median carina serrated and with tubercles. Prozonal carinae long and parallel. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process short, surpassing the middle of hind femora, seen from above, truncated posteriorly. Tegmen and hind wings absent. Anterior and middle femora flattened. The dorsal and ventral margin undulating, the ventral margin with some short hairs. The second segment of the tarsus short. Hind femora moderately slender (2.8x longer than wide), slightly inclined. The ventro-external carina curved laterally, with one lappet in the middle. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth small. A smaller lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with two white bands. Last article of the tarsi a little longer than the first. First and second pulvilli short and obtuse. The third pulvilli long as the sum of the first and second. Colour brown with light areas and some black parts. The male are a little smaller.

Differential diagnosis: *Planotettix fartmanni* is the only species of *Planotettix* gen. nov. with, in lateral view, some spiny tubercles on the serrated median carina.

Distribution: Found in the Lakekamu River Basin.

***Planotettix karubakensis* sp. nov.** (Plate 85 fig. 8, plate 86 fig. 9, plate 87 fig. 8)

Holotype ♀ BPBM, WEST PAPUA: Swart Valley, Karubaka [3°36' S 138°28' E], 1400 m, 21.XI.1958, leg. J. L. Gressitt.

Paratype ♀ BPBM, WEST PAPUA: Swart Valley, Karubaka [3°36' S 138°28' E], 1400-1600 m, 9.XI.1958, leg. J. L. Gressitt (light trap), deposited in ZMFK.

Derivatio nominis: The species is named after the type locality.

Measurements, holotype ♀: Pronotum length 3.6 mm, pronotum lobe width 3 mm, pronotum height 1.25 mm, postfemur length 3.8 mm, postfemur width 1.44 mm, vertex width 0.68 mm, eye width 0.36 mm. Paratype ♀: Pronotum length 3.68 mm, pronotum lobe width 2.96 mm, pronotum height 1.14 mm, postfemur length 3.84 mm, postfemur width 1.44 mm, vertex width 0.66 mm, eye width 0.38 mm.

Description, holotype ♀: Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium straight. Anterior half of the vertex a little lower than the posterior half. Fossulae deep. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved inwards, not reaching the medial carina. In lateral view not visible above the eyes (paratype: slightly visible). Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, not projected before the eyes. Frontal costa, in lateral view, not visible before the eyes. Fascial carinae, in lateral view, arched before the antenna. Scutellum in frontal view broad. Furcation of the frontal costa very short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above posterior part of the fastigium. Upper margin of the antennal grooves one diameter below the lower margin of the eyes. Pronotum flattened, covered with very densely impressed dots and short hairs. Median carina extending to the anterior border. In lateral view the median carina with one elevation above the lateral lobes, increasing at the middle of the prozonal area. Median carina smooth, slightly increasing to the posterior margin. Prozonal carinae long and parallel. Infrascapular area a little inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota rounded and strongly curved laterally. Pronotal process short, surpassing the middle of hind femora, seen from above truncated posteriorly. The posterior margin notched in the middle. Tegmen and hind wings absent. Ventral margin of the anterior and middle femora with two lobes. The dorsal margin undulated. The ventral margin of the middle femora with some short hairs. The second segment of the tarsus short. Hind femora moderately stout (2.6x longer than wide). The ventro-external carina curved laterally, without any lobes. The dorsal external area with one distinct conical hump. The median external area with one distinct lobe curved outwards. The ventral external area directed downwards, not distinctly coloured black. Genicular teeth small and acute, antegenicular teeth larger and serrated. The dorsal margin of the hind femora finely serrated without any lobes. Posttibia brown. Last article of the tarsi as long as the first. Pulvilli short and acute. The third pulvilli shorter than the sum of the first and second.

Differential diagnosis: The only species of *Planotettix* gen. nov. with one distinct conical hump on the dorsal external area but no further lobes on the outside of the hind femora.

Distribution: Only found in the Swart Valley in West Papua.

***Planotettix maai* sp. nov.** (Plate 85 figs 9-10, plate 86 figs 10-11, plate 87 figs 9-10)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [East Sepik Prov.], Bainyik, S. of Maprik [3°40'S 143°03'E], 150 m, 12.I.1960, leg. T. C. Maa.

Paratype ♂ BPBM, WEST PAPUA: Japen I., SSE Sumberbaba [1°49'S 136°45'E], Dawai R., Jungle, 28.X.1962, leg. H. Holtmann (light trap), deposited in ZMFK.

Derivatio nominis: Patronymic. The species is named after its collector, Tsing-chao Maa.

Measurements, holotype ♀: Pronotum length 3.36 mm, pronotum lobe width 2.96 mm, pronotum height 1.26 mm, postfemur length 3.6 mm, postfemur width 1.35 mm, vertex width 0.58 mm, eye width 0.38 mm. Paratype ♂: Pronotum length 3.44 mm, pronotum lobe width 2.31 mm, pronotum height 1.15 mm, postfemur length 3 mm, postfemur width 1.1 mm, vertex width 0.48 mm, eye width 0.36 mm.

Description, holotype ♀: Very small and wingless species. Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half. Fossulae shallow. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved inwards, not reaching the medial carina. In lateral view, slightly visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the middle of the eyes, a little projected above the eyes. Frontal costa, in lateral view, not visible before the whole eyes. Fascial carinae, in lateral view, arched before the antenna. In frontal view the lateral carinae forming the scutellum parallel. Scutellum in frontal view broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above posterior part of the fastigium. Antennae short. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum flattened, coarse with some short granulae and impressed dots. Median carina extending to the anterior border. In lateral view the median carina with two elevations. The higher one above the lateral lobes, the very low second one above the beginning of the hind femora. Humeral angles and interhumeral carinae distinct, but very inconspicuous. Prozonal carinae long and parallel. Infrascapular area a little inclined, reaching the end of the pronotum. In dorsal view the dorsal margin of the infrascapular area undulated. Internal lateral carinae absent. Lateral lobes of the paranota angular, strongly curved laterally. Pronotal process short, surpassing the middle of hind femora, seen from above truncated posteriorly. Tegmen and hind wings absent. Ventral and dorsal margin of the anterior and middle femora slightly undulated, without distinct lobes. The ventral margin of the middle femora with some short hairs. The second segment of the tarsus short. Hind femora moderately stout (2.6x longer than wide). The outside of the hind femora without any lobes. The dorsal external area with one distinct but low conical hump. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth small and acute. The antegenicular teeth smaller than the Genicular teeth. Posttibia brown with one white band. Last article of the tarsi a little shorter than the first. Pulvilli short and acute. The third pulvilli shorter than the sum of the first and second.

Differential diagnosis: It seems to be possible that both type-specimen from two very distant places - one from mainland of New Guinea and one from the island of Yapen – represent two valid species. However, I am not able to differentiate both type specimens. May be with further research and comparison of both sexes it could be possible. *Planotettix maai* is not as flattened as the other *Planotettix*-species. The femora are not inclined. It is together with *Planotettix karubakensis* the only species of *Planotettix* gen. nov. with angulary and not broadly rounded lobes but is differentiated from

this species by the absence of one distinct conical hump on the dorsal external area on the outside of the hind femora.
Distribution: Found on the island of Yapen and in the south of the Prince Alexander Mountains in the northwest of Papua New Guinea.

***Planotettix mountbaduriensis* sp. nov.** (Plate 85 fig. 11, plate 86 fig. 12, plate 87 fig. 11)
Holotype ♀ BMNH, WEST PAPUA: Japen, Seroi, Aiam Range, Mt. Baduri, Camp 1, 1000 ft., IX.1938, leg. L. E. Cheesman.

Derivatio nominis: The species is named after the type locality.
Measurements: Pronotum length 3.84 mm, pronotum lobe width 3.6 mm, pronotum height 0.9 mm, postfemur length 4.16 mm, postfemur width 1.35 mm, vertex width 0.48 mm, eye width 0.34 mm.
Description: Very flat and wingless species. Head not exerted above the pronotum, strongly inclined under the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half, broader than an eye. Fossulae shallow. Transverse carinae obsolete. Lateral carinae short, curved a little inwards, not reaching the medial carina. In lateral view slightly visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, arched and projected slightly before the eyes. Frontal costa, in lateral view, arched before the upper half of the eye. Fascial carinae, in lateral view, slightly arched before the antenna. Scutellum in frontal view narrower, a little broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above posterior half of the fastigium. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum very flattened, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. Prozonal carinae short and parallel. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally and truncated posteriorly. Pronotal process short, reaching the middle of the hind femora, seen from above, broadly truncated posteriorly, concavely emarginated. The 8. tergite with a distinct tubercle on the posterior margin. Tegmen and hind wings absent. Anterior and middle femora flattened and inclined to the body. The dorsal margin undulating. The ventral margin with three lappets and some very short hairs. The second segment of the tarsus short. Hind femora slender (3.1x longer than wide), inclined and flattened. The ventro-external carina curved laterally, with two lappets curved laterally. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth small and acute. The antegenicular teeth small. A medium sized lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Last article of the tarsi as long as the first. Pulvilli acute.
Differential diagnosis: Very flat species with inclined femora and with three distinct broad lobes on the ventral margin of the anterior and middle femora. Only *Planotettix planus* has the same characteristics but the posterior margin of the pronotal process has, seen from above, only a small incision.
Distribution: Only found on the island of Yapen.

***Planotettix planus* sp. nov.** (Plate 85 fig. 12, plate 86 fig. 1, plate 87 fig. 12)
Holotype ♂ BPBM, PAPUA NEW GUINEA: [Western Prov.] Telefomin [4°08'S 141°35'E], 1700 m, 8.VIII.1963, leg. R. Straatman.

Derivatio nominis: The name refers to the extremely flattened species.
Measurements: Pronotum length 3.44 mm, pronotum lobe width 3.2 mm, pronotum height 0.9 mm, postfemur length 3.75 mm, postfemur width 1.2 mm, vertex width 0.48 mm, eye width 0.3 mm.
Description: Very small wingless species with are extremely flattened body and pronotum. Head not exerted above the pronotum, strongly inclined under the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Vertex concave, broader than an eye. Transverse carinae obsolete. Lateral carinae short, curved a little inwards, not reaching the medial carina. In lateral view, minimally visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the supraocular lobes, arched and projected slightly before the eyes. Frontal costa, in lateral view, arched before the upper half of the eye. Fascial carinae, in lateral view, slightly arched before the antenna. Scutellum in frontal view narrow, a little broader than an antennal groove. Furcation of the frontal costa

short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, not touching the anterior margin of the pronotum. Their dorsal margin not extending above the fastigium. Upper margin of the antennal grooves below the lower margin of the eyes. Pronotum very flattened, coarse with some short carinulae and tubercles. Median carina extending to the anterior border. Prozonal carinae parallel or curved a little outwards towards the anterior border of the pronotum. In lateral view, the median carina undulated with two very low elevations. Humeral angles and interhumeral carinae absent. Infrascapular area inclined, reaching the end of the pronotum and with a black spot at the start. Internal lateral carinae absent. Lateral lobes of the paranota broadly rounded, strongly curved laterally. Pronotal process short, reaching the middle of the hind femora, seen from above broadly truncated posteriorly slightly rounded on each side of the median carina and notched in the middle. Tegmen and hind wings absent. Anterior and middle femora flattened and inclined to the body. The dorsal margin undulating. The ventral margin with three lappets and some very short hairs. The second segment of the tarsus short. Hind femora slender (3.1x longer than wide). Inclined and flattened. The ventro-external carina curved laterally, with two lappets curved laterally. The ventral external area directed downwards, coloured black. Genicular- and antegenicular teeth nearly absent. A medium sized lappet on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with two white bands. Last article of the tarsi as long as the first. Pulvilli obtuse. The third pulvilli shorter than the sum of the first and second. Colour from above light brown with some brownish spots. In ventral view all body parts black.

Differential diagnosis: Very flat species with inclined femora and with three distinct broad lobes on the ventral margin of the anterior and middle femora. Only *Planotettix mountbaduriensis* sp. nov. has the same characteristics but the posterior margin of the pronotal process is, seen from above, concave. *Planotettix planus* has a small incision.

Distribution: Only found on Telefomin mountain.

Planotettix riedei **sp. nov.** (Plate 85 figs 13-14, plate 86 figs 13-14, plate 87 figs 13-14)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Western Highlands Prov.], Fly River, Kiunga [6°07'S 141°18'E], 35 m, VIII.1969, leg. J. & M. Sedlacek.

Paratypes 1♀ (1/4), 2♂ (2/4-3/4) BPBM, PAPUA NEW GUINEA: [Western Highlands Prov.], Fly River, Kiunga [6°07'S 141°18'E], 35 m, VIII.1969, leg. J. & M. Sedlacek, thereof 1/4 in HMHN, 2/4 in BMNH, 3/4 in ZFMK; 1♀ (4/4) NCB-RMNH, WEST PAPUA: Boven-Digoelgebied, 400 km ten N v. Merauke, 1926, leg. A. Kalthofen.

Derivatio nominis: Patronymic. The species is named after Dr. Klaus Riede, a famous German orthopterologist.

Measurements, holotype ♀: Pronotum length 4.56 mm, pronotum lobe width 3.68 mm, pronotum height 1.65 mm, postfemur length 5.1 mm, postfemur width 2.01 mm, vertex width 0.78 mm, eye width 0.5 mm. Paratypes ♀♀: Pronotum length 4.72-4.96 mm, pronotum lobe width 3.76-3.84 mm, pronotum height 1.47-1.68 mm, postfemur length 4.96-5.52 mm, postfemur width 1.77-1.86 mm, vertex width 0.8-0.86 mm, eye width 0.48-0.5 mm. Paratypes ♂♂: Pronotum length 4.08-4.16 mm, pronotum lobe width 3.28 mm, pronotum height 1.29-1.45 mm, postfemur length 4.56-4.64 mm, postfemur width 1.59-1.7 mm, vertex width 0.7-0.74 mm, eye width 0.4-0.42 mm.

Description, holotype ♀: Head not exerted above the pronotum. Fastigium not reaching the frontal margin of the eyes. Anterior border of the fastigium rounded. Anterior half of the vertex a little lower than the posterior half. Fossulae shallow. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae longer, curved inwards and a little backwards to the medial carina. In lateral view not visible above the eyes. Medial carina in the posterior part obsolete, initiated in line of the middle of the eyes. Not projected above the eyes. Frontal costa, in lateral view, not visible before the whole eyes. Fascial carinae, in lateral view, arched before the antenna. Scutellum, in frontal view, broader than an antennal groove. Furcation of the frontal costa short above the superior ocelli, a little above the lower margin of the eyes. Superior ocelli in line with the lower margin of the eyes. Eyes subcircular, touching the anterior margin of the pronotum. Their dorsal margin not extending above posterior part of the fastigium. Upper margin of the antennal grooves a little below the lower margin of the eyes. Pronotum flattened, smooth and finely granulated. Median carina extending to the anterior border. In lateral view the median carina with two low elevations of equal height, more undulated. Humeral angles and interhumeral carinae absent. Prozonal carinae long and parallel. Infrascapular area a little inclined, reaching the end of the pronotum. In dorsal view the dorsal margin of the infrascapular area undulated.

Internal lateral carinae inconspicuous, but visible. Lateral lobes of the paranota rounded, strongly curved laterally. Pronotal process short, reaching the middle of hind femora, seen from above, the posterior apex narrow and truncated. Tegmen and hind wings absent. Ventral and dorsal margin of the anterior and middle femora finely serrulate, slightly undulated. The ventral margin of the middle femora with some short hairs. The second segment of the tarsus short. Hind femora moderately stout (2.5x longer than wide). The outside of the hind femora without any lobes. The dorsal external area with one inconspicuously low rounded hump. The ventral external area directed downwards, but not as strongly as in other *Planotettix*-species. Lower side coloured black. Genicular- and antegenicular teeth small and acute, without lappets on the dorsal margin of the hind femora in front of the antegenicular teeth. Posttibia brown with one white band. Last article of the tarsi a little shorter than the first. Pulvilli short and obtuse. The third pulvilli shorter than the sum of the first and second.

Differential diagnosis: *Planotettix riedei* is together with *Planotettix maai* the only species of *Planotettix* gen. nov. without lappet or lobe on the dorsal margin of the hind femora in front of the antegenicular teeth. From *Planotettix maai* sp. nov. it is differentiated by the broadly rounded lateral lobes and, in lateral view, the flat and undulated median carina without an arched elevation in the anterior part.

Distribution: Found in the south of New Guinea in the upper Fly River and upper Digul River

Key to species of *Planotettix* gen. nov.

1 Lamellate medial carina, in lateral view, visible in front of the eyes 4
- Medial carina, in lateral view, not visible in front of the eyes or in line with the eyes 2

2 Dorsal margin of the antennal grooves nearly in line with the lower margin of the eyes . *Planotettix riedei* sp. nov.
- Dorsal margin of the antennal grooves at least 1 diameter deeper than the lower margin of the eyes 3

3 Median carina smooth .... *Planotettix karubakensis* sp. nov.
- Median carina serrated .... *Planotettix fartmanni* sp. nov.

4 Lateral lobes in dorsal view broadly rounded. Hind femora with lobes on the ventro-external carinae 5
- Lateral lobes in dorsal view angular. Hind femora without lobes on the ventro-external carinae .... *Planotettix maai* sp. nov.

5 Pronotum, in lateral view, flattened or slightly undulated 6
- Pronotum, in lateral view, with two distinct elevations .... *Planotettix biroi* sp. nov.

6 Tergite 8 dorsal without a tubercle in the middle of the hind margin 7
- Tergite 8 dorsal with a small distinct tubercle in the middle of the hind margin. Yapen Island .... *Planotettix mountbaduriensis* sp. nov.

7 Lateral carinae not visible above the eyes 8
- Lateral carinae, in lateral view, visible above the eyes .... *Planotettix astrolabebayensis* sp. nov.

8 Hind femora with large lobes on the on the ventro-external carinae; ventral margin of the anterior and middle femora with three distinct lobes .... *Planotettix planus* sp. nov.
- Hind femora with small lobes on the on the ventro-external carinae; ventral margin of the anterior and middle femora with two distinct lobes 9

9 The integument is sparsely setose .... *Planotettix buergersi* sp. nov.
- The integument is densely setose .... *Planotettix cyclopensis* sp. nov.

***Potua* Bolívar, 1887**

Type species: *Potua coronata* Bolívar, 1887.

Distribution: India, Borneo and Sumatra.

Note: This genus is in need of revision.

***Potua aptera* Wagan, Kevan, 1992**

Holotype ♀ LEMQ, INDIA: Anaimalai Hills, Kadam Dari, 3500 ft, V.1963, leg. P. S. Nathan.

Differential diagnosis: After studying the drawings of the Holotype in the publication of Wagan & Kevan (1992), I am certain that this species does not belong to *Potua*. It possibly belongs to *Deltonotus* but further examinations are necessary to determine the correct allocation.

Distribution: Only found at Kadam Darin in India.

***Potua coronata coronata* Bolívar, 1887** (Plate 88 figs 1-3)
Syntype ♂ NHRS, MALAYSIA: Malacca, leg. Staudinger.
Syntype ♂ NMW, MALAYSIA: Borneo, Sarawak.
Additional material: 5♀, 4♂ NHRS, MALAYSIA: O. Borneo, Pajau River, leg. Mjöberg.

Distribution: Only found on Borneo.

***Potua coronata sumatrensis* Bolívar, 1898** (Plate 88 figs 4-6)
Type ♂ MSNG, INDONESIA: Sumatra, Si-Rambé, XII.1890-III.1891, leg. E. Modigliani.
Additional material: 1♀ SMTD, INDONESIA: Sumatra, Wai Lima Z. Sum. Lampongs, XI.-XII.1921, leg. Karny & Siebers; 1♀ SMTD, INDONESIA: Sumatra, Soekaranda, leg. Dohrn; 1♀ MNSL, INDONESIA: Sumatra, Naturreservat Harau 90 km von Padang Panjang (West-Sumatra), 1991, leg. Bujang.

Distribution: Only found on Sumatra.

***Potua morbillosa* (Walker, 1871)**
Holotype ♂ BMNH, MALAYSIA: Borneo, Sarawak.

Distribution: Only found on Borneo.

***Potua sabulosa* Hancock, 1915** (Plate 88 figs 7-9)
Holotype ♂ ANSP, INDIA: [Bombay Pres.], Satara dist., Yenna Valley, Medina, 2500-3500 ft, 17.-23.IV.1912, leg. F. H. Gravely.

Distribution: Only found at Medina in India.
Note: After studying images of the holotype, I am certain that this species belongs to *Potua* Bolívar, 1887.

***Pseudohyboella* Günther, 1938**
Type species: *Pseudohyboella weylandiana* Günther, 1938.
Distribution: This genus is only found in the southwest of West Papua.

***Pseudohyboella weylandiana* Günther, 1938** (Plate 88 figs 10-12)
Holotype ♀ ZMHU, WEST PAPUA: Weyland-Gebirge, 1500 m, 1931, leg. G. Stein.
Additional material: WEST PAPUA: 2♂ NCB-RMNH, Neu Guinea; 1♀, 1♀ larva BPBM, Vogelkop, Bomberi, 700-900m, 10.VI.1959, leg. T. C. Maa; 1♂ BPBM, Vogelkop, Bomberi, 700-900m, 9.VI.1959, leg. J. L. Gressitt; 1♂ BPBM, S. Geelvink Bay, Nabire (Light Trap) [3°22'S 135°28'E], 14.IX.1962, leg. H. Holtmann; 1♂ BPBM, S. Geelvink Bay, Nabire [3°22'S 135°28'E], 2.-9. VII.1962, leg. J. L. Gressitt; 1♂ BPBM, Vogelkop, Kebar Val[ley]., W[est]. of Manokwari, 550m, 4.-31.I.1962, leg. L. W. Quate; 1♀ CDT: Raja Ampat, Misool Island (central), River Gam upstream, Gamta vill. 12-14 km NW, 01°57'50''S 130°11'09''E, 70-350 m, 4.-6.II.2012, primeval lowland rainforest on limestone, leg. D. Telnov.

Measurements, holotype ♀: Pronotum length 9.62 mm, pronotum lobe width 5.59 mm, pronotum height 3.2 mm, postfemur length 7.54 mm, postfemur width 3.25 mm, vertex width 1.28 mm, eye width 0.6 mm. ♀♀: Pronotum length 8.97-9.23 mm, pronotum lobe width 5.07-5.46 mm, pronotum height 3-3.1 mm, postfemur length 6.63-7.15 mm, postfemur width 2.6-3.25 mm, vertex width 1.26 mm, eye width 0.58-0.6 mm. ♂♂: Pronotum length 8.32-8.71 mm, pronotum lobe width 4.94-4.95 mm, pronotum height 2.75-2.95 mm, postfemur length 6.24-6.5 mm, postfemur width 2.9-3 mm, vertex width 1-1.22 mm, eye width 0.56-0.58 mm. One very small ♂ with all typical characteristics of this species has the following measurements: pronotum length 6 mm, pronotum lobe width 4 mm, pronotum height 2.25 mm, postfemur length 5.36 mm, postfemur width 2.15 mm, vertex width 1.08 mm, eye width 0.42 mm.
Distribution: Found in the west of West Papua and on Misool.

Stegaceps Hancock, 1913
Type species: *Stegaceps brevicornis* Hancock, 1913.
Distribution: This genus is only found on Borneo.

***Stegaceps brevicornis* Hancock, 1913** (Plate 88 figs 13-15)
Holotype ♀ ANSP, MALAYSIA: Borneo, Kabong, Kuching, VI.1900.

Differential diagnosis: Günther (1938a) supposed it might be the micropterous form of *Boczkitettix borneensis* (Günther, 1935) (originally described as *Dolatettix*). With no doubts, this specimen belongs to the Claodonotinae, because the scutellum is clearly widened. Together with *Paraphyllum antennatum* Hancock, 1913 it is the only known South-East-Asian specimen of Cladonotinae with tegmen and long hind wings. *Stegaceps brevicornis* is macropronotal and brachypter. There are some obvious differences to *Boczkitettix borneensis* (Günther, 1935): the antennae are shorter, the lateral lobes are rounded and curved downwards not contiguous to the body. In lateral view, only the apex of the fastigium and

not the whole frontal costa is visible in before the eyes.
Note: This is a valid species and not the micropterous form of *Boczkitettix borneensis* (Günther, 1935).

Tepperotettix Rehn, 1952
Type species: *Tepperotettix reliquia* Rehn, 1952.
Distribution: This genus is only found in Australia.

***Tepperotettix reliquia* Rehn, 1952** (Plate 89 figs 1-6)
Holotype ♀ MCZ, AUSTRALIA: Queensland, McPherson Range, National Park, 3000-4000 ft, 11.III.1932, leg. P. J. Darlington.
Additional material: 1♂ MHNG, AUSTRALIA: Queensland, McPherson Range, Lamington National Park, Mt. Merino (28°15'S 153°12E), 1050-1100 m, 6.I.1992, leg. D. Burckhardt; 1♀ AMS, AUSTRALIA: Queensland, Tamborine Mt., 20.XII.1961, leg. McAlpine & Lossin.

Measurements ♂ MHNG: Pronotum length 5.36 mm, pronotum lobe width 3.36 mm, pronotum height 1.4 mm, postfemur length 4.5 mm, postfemur width 1.5 mm, vertex width 0.76 mm, eye width 0.38 mm. ♀, AMS: Pronotum length 6.08 mm, pronotum lobe width 3.92 mm, pronotum height 1.2 mm, postfemur length 5.1 mm, postfemur width 1.9 mm, vertex width 0.78 mm, eye width 0.5 mm.

Tondanotettix Willemse, 1928
Type species: *Tondanotettix brevis* (Haan, 1842).
Differential diagnosis: According to the description of *Devriesetettix* gen. nov. (type species *Devriesetettix dorreus* (Hancock, 1909), formerly *Tondanotettix dorreus*), there are now two species of *Tondanotettix* Willemse, 1928: *Tondanotettix modestus* Günther, 1937 and *Tondanotettix brevis* (Haan, 1842).
Distribution: This genus is only found on Sulawesi.

***Tondanotettix brevis brevis* (Haan, 1842)** (Plate 89 figs 7-9)
Holotype ♀ NCB-RMNH, INDONESIA: [Sulawesi], Tondano.

Measurements: Pronotum length 10.01 mm, pronotum lobe width 5.2 mm, pronotum height 3.11 mm, postfemur length 6.37 mm, postfemur width 2.99 mm, vertex width 1.16 mm, eye width 0.64 mm (I examined the holotype).
Differential diagnosis: The species differs from *Tondanotettix modestus* Günther, 1937 by the humps of the pronotum. *Tondanotettix modestus* Günther, 1937 has flattened pronotum.

***Tondanotettix brevis meridionalis* Günther, 1937**
Lectotype ♀ MZPW (Museum Stettin), INDONESIA: [Sulawesi], Südcelebes, Lompo Batang, 1000 m, III.1896, leg. Fruhstorfer.
Paralectotype ♂ MZPW (Museum Stettin), INDONESIA: [Sulawesi], Südcelebes, Bonthain, III.1896, leg. Fruhstorfer.

It appears questionable whether the split into two subspecies is correct. Günther (1937) have not reviewed the holotype from Leiden (NCB-RMNH) and postulated the subspecies with a male and a female from South Celebes as syntypes. It is not clear whether the types in fact still exist. On account of the two existing drawings of the female by Günther, I postulate the female as a lectotype and the male as paralectotype. The subspecies differs therefore, and according to the descriptions of Günther, from the holotype of *Tondanotettix brevis brevis* only by the slightly elevated hump on the pronotum. This characteristic could also be part of the variability of the nominate subspecies. Further research and a diagnosis of the types from Stettin would be necessary for a final decision.

Willemsetettix gen. nov.
Type species: *Willemsetettix willemsei* **sp. nov.**
Derivatio nominis: Patronymic. The genus is named after the famous orthopterologist and very helpful friend Fer Willemse (1927-2009).
Description: The micropronotal and wingless specimens are very small. The head is not exserted. The lamellate medial carina is characteristic for this genus: beginning in line with the supraocular lobes and, in lateral, view strongly elevated above and before the eyes. The upper margin of the antennal grooves is slightly higher than the lower margin of the eyes. The scutellum is relatively broad. In lateral view the pronotum is arched in the anterior half and straight in the posterior half. The apex of the pronotum is broadly obtuse.
Differential diagnosis: The fastigium looks similar to *Boczkitettix* gen. nov. and *Ingrischitettix* gen. nov. But the pronotum appears to be different. In *Boczkitettix* gen. nov. and *Ingrischitettix* gen. nov. it is arcuated over its entire length. In frontal view *Ingrischitettix* gen. nov. is clearly distinct from *Willemsetettix* gen. nov. by the relatively narrow scutellum, the continuous frontal costa and the u-shaped transverse carinae.

Distribution: Endemic on New Guinea.

Willemsetettix laeensis **sp. nov.** (Plate 90 figs 1, 7, plate 91 fig 1)

Holotype ♀ BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Lae, Bubia Agric. Sta., 15 m, 6.VII.1957, leg. D. Elmo Hardy.

Derivatio nominis: The species is named after the type locality, the city of Lae.

Measurements: Pronotum length 6.56 mm, pronotum lobe width 3.36 mm, pronotum height 2.75 mm, postfemur length 4.5 mm, postfemur width 2 mm, vertex width 0.84 mm, eye width 0.42 mm.

Description: Head lower than the pronotum. Fastigium projecting before and above the eyes. Anterior border, in dorsal view, on a level with the eyes, slightly triangularly projected to the frontal costa. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short and curved inwards, lamellar and, in lateral view, visible above the eyes. Medial carina beginning in line with the supraocular lobes, strongly elevated above and before the eyes. Fascial carinae, in lateral view, arched and projected before the antenna. Scutellum much broader than an antennal groove. Superior ocelli in line with the lower third of the eyes. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes touching the anterior margin of the pronotum. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Antennae with 14 segments. Pronotum, in frontal view, tectiform, rugose with some short carinulae and tubercles. Pronotum, in lateral view, arched, increasing in the anterior third and descending to the posterior apex. The anterior apex of the pronotum extending over the head to the middle of the eyes. Median carina extending to the anterior border. Prozonal carinae long and straight but difficult to see. Interhumeral carinae very short. Infrascapular area relatively broad, reaching the apex of the pronotum. Internal lateral carinae absent. Lateral lobes, in dorsal view, rounded and curved laterally. Pronotal process surpassing the middle of hind femora. Posterior margin of the pronotal process, seen from above, broad and straight. Tegmen and wings absent. Anterior and middle femora relatively slender, the dorsal margin slightly undulating. Anterior femora ventral with one small lobe. Middle femora dorsal with some very short hairs. Second segment of the tarsus short. Hind femora rather stout (2.2x longer than wide). Hind tibia with two light bands. Genicular- and antegenicular teeth small and acute. First article of the tarsi a little longer than the last. Pulvilli acute, the third pulvilli shorter than the sum of the first and second.

Differential diagnosis: in this species the prozonal carinae are slightly obsolete and the anterior apex of the pronotum is extending over the head to the middle of the eyes.

Distribution: Only found at the type locality near Lae in the west of New Guinea.

Willemsetettix missai **sp. nov.** (Plate 90 figs 2-3, 8-9, plate 91 figs 2-3)

Holotype ♀ IRSNB, PAPUA NEW GUINA: [Madang Prov.], Baiteta Bacs Blancs A1, 6.VII.1995, leg. Olivier Missa, Canopy Mission.

Paratypes 1♂ (1/5) IRSNB, PAPUA NEW GUINA: [Madang Prov.], Baiteta Bacs Blancs M2 [5°01'S 145°45'E], 23.VI.1995, leg. Olivier Missa, Canopy Mission; 1♀ (2/5) IRSNB, PAPUA NEW GUINA: [Madang Prov.], Baiteta Bacs Blancs M2 [5°01'S 145°45'E], 19.V.1995, leg. Olivier Missa, Canopy Mission, deposited in ZFMK; 1♀ (3/5) IRSNB, PAPUA NEW GUINA: [Madang Prov.], Baiteta Bacs Blancs XG [5°01'S 145°45'E], 23.VI.1995, leg. Olivier Missa, Canopy Mission, deposited in NCB-RMNH; 1♀ (4/5) IRSNB, PAPUA NEW GUINA: [Madang Prov.], Baiteta Bacs Blancs AR3 [5°01'S 145°45'E], 6.VII.1995, leg. Olivier Missa, Canopy Mission, deposited in BMNH; 1♂ (5/5) BPBM, PAPUA NEW GUINA: [Madang Prov.], Madang (Alpinia) [5°13'S 145°48'E], 5 m, 28.X.1958, leg. J. L. Gressitt.

Derivatio nominis: Patronymic. The species is named after the collector Olivier Missa.

Measurements, holotype ♀: Pronotum length 4.9 mm, pronotum lobe width 3.05 mm, pronotum height 2.05 mm, postfemur length 3.75 mm, postfemur width 1.65 mm, vertex width 0.68 mm, eye width 0.33 mm. Paratypes ♀♀: Pronotum length 4.65-4.9 mm, pronotum lobe width 3.0-3.1 mm, pronotum height 1.85-2.1 mm, postfemur length 3.9 mm, postfemur width 1.66-1.7 mm, vertex width 0.74-0.78 mm, eye width 0.35-0.37 mm. Paratypes ♂♂: Pronotum length 4.1-4.25 mm, pronotum lobe width 2.7-2.9 mm, pronotum height 1.75 mm, postfemur length 3.4-3.55 mm, postfemur width 1.52-1.6 mm, vertex width 0.64-0.68 mm, eye width 0.35-036 mm.

Description, holotype ♀: Head lower than the pronotum. Fastigium projecting before and above the eyes. Anterior border, in dorsal view, on a level with the eyes, slightly triangularly projected to the frontal costa. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae short

and curved inwards, lamellar and, in lateral view, visible above the eyes. Medial carina beginning in line with the supraocular lobes, strongly elevated and broadly arched above and before the eyes. Fascial carinae, in lateral view, slightly projected before the antenna. Scutellum much broader than an antennal groove. Superior ocelli in line with the lower third of the eyes. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes touching the anterior margin of the pronotum. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Antennae with 13 segments. Pronotum, in frontal view tectiform, rugose with some short carinulae and tubercles. Pronotum, in lateral view, arched, increasing in the anterior third and descending to the posterior apex. The anterior apex of the pronotum straight, only the tip of the median carina a little projected. Median carina extending to the anterior border. Prozonal carinae a little elevated curved inwards towards the anterior border. Interhumeral carinae absent. Infrascapular area broad, reaching the apex of the pronotum. Internal lateral carinae absent. Lateral lobes, in dorsal view, broadly rounded. Pronotal process surpassing the middle of hind femora. Posterior margin of the pronotal process, seen from above, broad, slightly concave. Tegmen and wings absent. Dorsal margin of the anterior and middle slightly undulating. Middle femora dorsal with some very short hairs. Second segment of the tarsus short. Hind femora stout (2.3x longer than wide). Hind tibia with two light bands. Genicular- and antegenicular teeth small and acute. First article of the tarsi a little longer than the last. Pulvilli obtuse, the third pulvilli shorter than the sum of the first and second.
Differential diagnosis: In this species the medial carina, in lateral view, is relatively highly elevated above the eyes.
Distribution: Only found in the area of Madang.

***Willemsetettix oriomoensis* sp. nov.** (Plate 90 figs 4, 10, plate 91 fig. 4)
Holotype ♂ BPBM, PAPUA NEW GUINEA: [Western Prov.], Oriomo Govt. Sta. [8°52'S 143°11'E], 26.-28.X.1960, leg. J. L. Gressitt.

Derivatio nominis: The species is named after the type locality.
Measurements: Pronotum length 5.4 mm, pronotum lobe width 2.9 mm, pronotum height 2 mm, postfemur length 3.25 mm, postfemur width 1.65 mm, vertex width 0.76 mm, eye width 0.36 mm.
Description: Head lower than the pronotum. Fastigium projecting before and above the eyes. Anterior border, in dorsal view, on a level with the eyes. Vertex broader than an eye. Transverse carinae obsolete. Lateral carinae very short and curved inwards. In lateral view, visible above the eyes. Medial carina beginning in line with the supraocular lobes, strongly elevated and broadly arched above and before the eyes. Fascial carinae, in lateral view, slightly projected before the antenna. Scutellum much broader than an antennal groove. Superior ocelli in line with the lower third of the eyes. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes touching the anterior margin of the pronotum. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Antennae with 13 segments. Pronotum, in frontal view lower tectiform, rugose with some short carinulae and tubercles. Pronotum, in lateral view, arched, increasing in the anterior third and descending to a concave part above the beginning of the hind femora. The posterior part of the pronotum flat. The anterior apex of the pronotum straight. Median carina extending to the anterior border. Prozonal carinae elevated, curved inwards towards the anterior border. Interhumeral carinae distinct. Infrascapular area broad, reaching the apex of the pronotum. Internal lateral carinae absent. Lateral lobes, in dorsal view, broadly rounded. Pronotal process reaching the anterior margin of the knees. Posterior margin of the pronotal process, seen from above, broad and straight. Tegmen and wings absent. Dorsal margin of the anterior and middle slightly undulating. Middle femora dorsal with some very short hairs. Second segment of the tarsus short. Hind femora rather stout (2x longer than wide). Hind tibia with two light bands. Genicular- and antegenicular teeth small and acute. First article of the tarsi longer than the last. Pulvilli spinose, the third pulvilli shorter than the sum of the first and second.
Differential diagnosis: The anterior half of the pronotum is lower arched and the posterior half flattened with a concave passage between the halves. In *Willemsetettix willemsei* the anterior part is relatively higher. In other species of *Willemsetettix* gen. nov. the median carina descending to the posterior apex of the pronotum.
Distribution: Only found at the type locality.

***Willemsetettix wauensis* sp. nov.** (Plate 90 figs 5, 11, plate 91 fig. 5)
Holotype ♀ BPBM, PAPUA NEW GUINEA: [Morobe Prov.], Wau, 1200 m, 15.-22.XI.1961, leg. J. Sedlacek (Coll. Bishop)

Paratypes 1♀ (1/4) BPBM, [Morobe Prov.], Wau, 1300m, 10.IX.1961, leg. J. Sedlacek, deposited in NCB-RMNH; 1♀ (2/4) BPBM, [Morobe Prov.], Wau, 1050m, 10.IX.1961, leg. J. & M. Sedlacek, deposited in BMNH; 1♀ (3/4) BPBM, [Morobe Prov.], Wau, 1200-1500 m, 30.VIII.1965, leg. J. Sedlacek, deposited in IRSNB; 1♀ (4/4) BPBM, [Morobe Prov.], Wau, 1200-1300 m, 14.IX.1965, leg. J. Sedlacek, deposited in ZFMK.

Derivatio nominis: The species is named after the type locality, the city of Wau.
Measurements, holotype ♀: Pronotum length 5.76 mm, pronotum lobe width 3.6 mm, pronotum height 2.5 mm, postfemur length 5.04 mm, postfemur width 2.2 mm, vertex width 1 mm, eye width 0.5 mm. Paratypes ♀♀: Pronotum length 5.44-5.76 mm, pronotum lobe width 3.52-3.68 mm, pronotum height 2.5-2.7 mm, postfemur length 5.12-5.28 mm, postfemur width 2.15-2.25 mm, vertex width 1-1.06 mm, eye width 0.46-0.5 mm.
Description, holotype ♀: Head lower than the pronotum. Fastigium projecting before and above the eyes. Anterior border, in dorsal view, projected triangularly before the eyes. Vertex 2x broader than an eye. Transverse carinae obsolete. Lateral carinae short and curved inwards, in lateral view, visible above the eyes. Medial carina beginning in line with the supraocular lobes, a little elevated and broadly arched above and before the eyes. Fascial carinae, in lateral view, slightly projected before the antenna. Scutellum much broader than an antennal groove. Superior ocelli in line with the lower third of the eyes. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes not touching the anterior margin of the pronotum. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Pronotum, in frontal view relatively low but tectiform, rugose with some short carinulae and tubercles. Pronotum, in lateral view, slightly arched, increasing in the anterior third and descending to the posterior apex. Median carina extending to the anterior border. Prozonal carinae long and straight. Interhumeral carinae distinct. Infrascapular area broad, reaching the apex of the pronotum. Internal lateral carinae absent. Lateral lobes, in dorsal view, broadly rounded. Pronotal process surpassing the middle of hind femora. Posterior margin of the pronotal process, seen from above, broad and slightly convex. Tegmen and wings absent. Dorsal margin of the anterior and middle femora straight. Middle femora dorsal with some very short hairs. Second segment of the tarsus short. Hind femora stout (2.3x longer than wide). Hind tibia with two light bands. Genicular- and antegenicular teeth small and acute. First article of the tarsi longer than the last. Pulvilli acute, the third pulvilli shorter than the sum of the first and second.
Differential diagnosis: The anterior border of the fastigium projecting considerably before the eyes. Even the lateral carinae, in dorsal view, projecting before the anterior margin of the eyes. It is the only species of *Willemsetettix* gen. nov. with this characteristics.
Distribution: Only found in the area of Wau.

***Willemsetettix willemsei* sp. nov.** (Plate 90 figs 6, 12, plate 91 fig. 6)

Holotype ♂ BPBM, WEST PAPUA: Genjam, 40 km W of Hollandia [2°46'S 140°12'E], 100-200 m, 1.-10. III.1960, leg. T. C. Maa.
Paratype ♂ (1/1) BMNH, WEST PAPUA: Cyclops Mts., Sabron [2°30'S 140°25'E], 930 ft, IV.1936, leg. L. E. Cheesman.

Derivatio nominis: Patronymic. The species is named after my good friend Luc Willemse, like his father a famous orthopterologist.
Measurements, holotype ♂: Pronotum length 3.6 mm, pronotum lobe width 2.6 mm, pronotum height 1.9 mm, postfemur length 3 mm, postfemur width 1.35 mm, vertex width 0.66 mm, eye width 0.32 mm. Paratype ♂: Pronotum length 3.95 mm, pronotum lobe width 2.9 mm, pronotum height 1.9 mm, postfemur length 3 mm, postfemur width 1.45 mm, vertex width 0.6 mm, eye width 0.4 mm.
Description: Rather small micropronotal species. Head lower than the fastigium and pronotum. Fastigium projecting before and above the eyes, in lateral view, square. Anterior border in dorsal view on a level with the eyes. Vertex slightly convex with a concave part near the eyes, 2x broader than an eye. Transverse carinae obsolete. Lateral carinae short and curved inwards, lamellar and, in lateral view, visible above the eyes. Medial carina beginning in line with the supraocular lobes, strongly elevated above and before the eyes. Frontal costa obsolete. Fascial carinae, in lateral view, strongly arched and projected before the antenna. Furcation of the frontal costa obsolete. The two fascial carinae begin in line with the superior ocelli. Scutellum much broader than an antennal groove. Superior ocelli in line with the lower third of the eyes. Eyes subcircular, their dorsal margin lower than the fastigium. Eyes almost touching the anterior margin of the pronotum. Upper margin of the antennal grooves slightly in excess of the lower margin of the eyes. Antennae with 13 segments. Pronotum

in the anterior half tectiform and in the posterior half flattened. Pronotum coarse, anterior border straight. Median carina arched in the posterior half and extending to the anterior border. Prozonal carinae little elevated and curved outwards towards the anterior border. Interhumeral carinae distinct. Infrascapular area relatively broad with a concave part posteriorly, reaching the apex of the pronotum. Internal lateral carinae absent. Lateral lobes curved laterally, broadly rounded. Pronotal process, seen from above, obtuse, slightly emarginated to the middle. Tegmen and wings absent. Anterior and middle femora relatively broad, the dorsal margin undulating. Middle femora dorsal without hairs. Second segment of the tarsus short. Hind femora rather stout (2.2x longer than wide). Dorso- and ventro-external carina without projections. Hind tibia in the lower half bright and with a light band in the upper half. Genicular- and antegenicular teeth medium sized, acute. First article of the tarsi a little longer than the last. Pulvilli short and acute. The third pulvilli shorter than the sum of the first and second.

Differential diagnosis: *Willemsetettix willemsei* is the smallest species in its genus. Only in this species is the frontal costa between medial carina and fascial carinae obsolete and the dorsal margin of the scutellum is open. The anterior half of the pronotum strongly arched and the posterior half flattened.

Distribution: Found only at the north-east coast of West Papua, West of Jayapura.

Key to species of *Willemsetettix* gen. nov.

1 Posterior apex of the pronotum, in dorsal view, slightly convex 2
- Posterior apex of the pronotum emarginated, sulcated or almost straight 3

2 Anterior apex of the pronotum extending over the head .... *Willemsetettix laeensis* sp. nov.
- Anterior apex of the pronotum straight .... *Willemsetettix wauensis* sp. nov.

3 Furcation of the fascial carinae absent .... *Willemsetettix willemsei* sp. nov.
- Furcation of the fascial carinae present 4

4 Median carina, in lateral view, increasing in the anterior third and descending to the posterior apex .... *Willemsetettix missai* sp. nov.
- Median carina, in lateral view, arched in the anterior half. The posterior half slightly flattened .... *Willemsetettix oriomoensis* sp. nov.

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The *Monosyntaxis* Swinhoe, 1901 complex of sibling species in New Guinea (Lepidoptera: Erebidae: Arctiinae: Lithosiini)

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Abstract: Six new species of *Monosyntaxis* Swinhoe, 1901 have been discovered in New Guinea. They belong to a complex of sibling species of which some are difficult to distinguish by wing pattern alone from the common *M. bipunctata* (Bethune-Baker, 1904) from Southeast Papua New Guinea. However, the genitalia are strikingly different, and the aedeagi especially proved to have distinct diagnostic characters. The new species are *M. honeyi* sp. nov., *M. fojaensis* sp. nov., *M. kobowrensis* sp. nov., *M. arfakensis* sp. nov., *M. kratkeensis* sp. nov., and *M. postfuscata* sp. nov. All the new species seem to occur allopatrically in the high mountain areas of New Guinea and are described here and compared with the already known *M. bipunctata* (Bethune-Baker, 1904), *M. persimilis* Rothschild, 1912 and *M. bimaculata* De Vos, 2009.

Key words: Revision, *Monosyntaxis*, New Guinea.

Introduction

In the overview on the genus *Monosyntaxis* Swinhoe, 1901 by De Vos (2009) nine species are listed which are distributed in Sundaland, the Philippines, Sulawesi, New Guinea and Samoa, of which three were endemic to New Guinea. With the discovery of six new species in New Guinea, the total number of species in the genus increases to fifteen. Another species that previously has been arranged in this genus, *Oeonistis metallescens* Rothschild, 1912, has been transferred to the genus *Papuasyntaxis* De Vos, 2009.

The species of the genus *Monosyntaxis* can be divided into two distinct colour groups: in the area west of New Guinea males are mostly black with red markings, while females are much larger and have a yellow with black bar-pattern. In New Guinea and Samoa, both males and females of all species are silvery white or pale yellow with blackish markings; females are larger than males but with less pronounced sexual dimorphism. Remarkable is the absence of species in the Moluccas which led Holloway (2001) to suggest that the species from New Guinea and Samoa would probably not be related to the western group which includes the type of the genus, *Monosyntaxis trimaculata* (Hampson, 1900). Holloway (pers. comm.) states that both, the western group and the eastern group presumably are monophyletic groups. The question then is whether there are synapomorphies to show that these groups have a sister-relationship or whether they both belong to a general mix of genera thrown in *Chrysaeglia* Butler, 1877, *Oeonistis* Hübner, 1819, *Papuasyntaxis* De Vos, 2009 and so on, with forewing facies that is diversely patterned with iridescent bluish black and pale yellow to white. But, despite the gap in distribution and the striking differences of both groups, the morphology of the genitalia indicate that they most likely are congeneric or at least belong to a group of closely related genera so for the moment the species treated in this overview are considered to belong to *Monosyntaxis*. A broader cladistic analysis on morphology is needed to understand the relations between the genera and it would be interesting to have a molecular analysis of both groups in the future to test this.

The two common previously known species from New Guinea, *Monosyntaxis bipunctata* and *M. persimilis*, are easily distinguished by the differently shaped black markings on the silvery white forewings. A third species, again easily distinguished by the large round patches on the forewings, was recently found in the Foja Mountains: *M. bimaculata* De Vos, 2009.

Previously it was assumed that *M. bipunctata* and *M. persimilis* were widely distributed all over New Guinea, but now it appears that the first species is restricted to the southeastern part of the island. In the western part the specimens similar to *M. bipunctata* appear to belong to different species. At least six additional sibling species were discovered. It appears that larger isolated mountain ranges have their own species, in the Arfak Mountains, the Kobowre (Weyland) Mountains, the Foja Mountains and the Jayawijaya Mountains in Indonesian New Guinea, and the Kratke Mountains and the Owen Stanley Range in Papua New Guinea. It would be wise to check material from other isolated areas too to confirm this and perhaps to discover more isolated species of this complex. For instance the isolated Finisterre Mountain Range in Papua New Guinea, from which *bipunctata* phenotype specimens are known but not yet investigated on genitalia, could inhabit a new species. The wide distribution gap of the species complex in the center and west of Papua New Guinea, as shown in plate 101 (figs 3-4), is striking. It is probably due to poor sampling rather than absence of specimens in that area. It would be most interesting to have material from that wide and probably varied area to study in more detail.

Abbreviations used

Fwl – Forewing length (measured from wingbase to apex);
mm – millimeters;
PNG – Papua New Guinea.
BMNH – Natural History Museum (former British Museum for Natural History, London, United Kingdom);
CMWM –collection Thomas Witt, München (assigned to Zoologische Staatssammlung München, Germany);
KSP – Kelompok Serangga Papua (collection of Br. Henk van Mastrigt, Jayapura, Papua, Indonesia);
MZB - Museum Zoologicum Bogoriense, Cibinong, Java, Indonesia;
RMNH – Naturalis Biodiversity Center (former Rijksmuseum voor Natuurlijke Historie and Nationaal Natuurhistorisch Museum), Leiden, The Netherlands;
UNCEN – University of Cenderawasih, Waena, Papua, Indonesia;
ZMAN – Naturalis Biodiversity Center (former Zoölogisch Museum van Amsterdam), The Netherlands.

Material and methods

For the study of the species it was necessary to dissect the genitalia of at least one male and female when available. The dissected genitalia are put in cold KOH 10 % for one night. After washing and cleaning from fat, scales and dirt in 30% alcohol the genitalia where stained in a solution of chlorazol-black in 30% alcohol and affixed in 95% alcohol. Then the genitalia were prepared for preservation in Euparal Essence (to prevent air bubbles) and after a few minutes put on a glass slide in a few drops of Euparal medium on the standard as used in the Natural History Museum in London: abdomen on left side, genital armature top right, aedeagus bottom right. To prevent the smaller parts, like aedeagus, from floating the Euparal drops were left to dry at least 24 hours without glass cover in a closed petri-dish (to protect against dust). The next day a proper sized glass cover was put on the preparate in the sticky Euparal with addition of a few fresh drops of Euparal. This complete preparate is left to dry for weeks to months in the petri-dish. Proper slide labels are added after completely drying, so therefore it is necessary to write preparate number and details on the petri-dish cover and to scratch the number on the glass slide to avoid mixing up with other drying slides.

Slides were studied with a WILD M3 binocular microscope with magnifications 60-400x. Digital photographs were made with a motorized Zeiss V20 binocular microscope and a digital Axio MRc5 camera controlled by Axiomanager M2 software.

Descriptions

General diagnosis of the *Monosyntaxis bipunctata* complex

Male antenna black or dark grey-brown, bipectinate. Female antenna filiform ciliated. Head and at least patagia dorsally golden to pale yellow, meso- and metathorax with black pattern which can be much extended, white posteriorly, tegulae with a black central spot which can cover the whole tegulae in some species. Abdomen dorsally grey-white with, in males, a golden yellow anal tuft.

Forewings more or less shiny silvery white with two blackish spots with steel blue iridescence: a larger mid-dorsal one and a smaller distal one. Hindwings in males white, in females usually with a more or less yellow tinge.

Specific diagnoses are mentioned for each species below.

Male genitalia with uncus small, heart-shaped with long setae. Tuba analis usually much larger than uncus. Tegumen arched and rather narrow. Valvae elongate, distal third longitudinally divided into costal and saccular halves. Cucullus width is diagnostic, sacculus at inner ridge in basal half covered with short setae, gradually narrowing to an apical extension with a club-shaped apex that carries a ridge of small teeth, apex slightly bent upwards with a group of thorns. Juxta simple, shield-shaped. Saccus well developed, V-shaped and bent downwards as a spoon. Aedeagus is highly diagnostic, short with tube of aedeagus broad, ventro-distally extended. Vesica with one or two characteristic cornuti.

Female genitalia with well developed sclerotized cervix bursae of which the shape and size are diagnostic. Ductus seminalis originating at the base of the cervix bursae. Bursa copulatrix with one small signum at the bottom of the bursa.

***Monosyntaxis bipunctata* (Bethune-Baker, 1904)** (Plate 92 figs 1-2, plate 94 figs 2-5, plate 99 figs 1-2)

Chrysaeglia bipunctata Bethune-Baker (1904: 420); Draudt (1914: 201).
Monosyntaxis bipunctata: Rothschild (1912: 224) [in part]; Strand (1922: 595); Holloway (2001: 291); De Vos (2009: 3) [in part].

Holotype ♂ BMNH, British New Guinea [Papua New Guinea], Dinawa, viii.1902, A.E. Pratt.
Note: In BMNH a specimen, originating from Mt. Kebea [PNG], is erroneously labeled with the holotype label. In his original publication Bethune-Baker (1904) designated the Dinawa specimen as type. Furthermore one specimen is present in this series from Aroa River [PNG].

Diagnosis: Fwl. ♂ 15.4-16.8, ♀ 20.5-20.9 mm. Shiny silvery white forewings with sharply defined blackish steel blue spots. Spots in male rather small, mid-dorsal spot is a short straight bar, the distal spot is not distinctly elongated. Hindwing of male pure white, in female bone-white gradually darkening to pale yellow marginally.
Genitalia: Male genitalia (BM6290) with valvae rather narrow, cucullus broad, apical extension of sacculus with club-shaped apex with a ridge of small teeth, apex bent upwards with a group of short thorns. Aedeagus short with strongly constricted coecum, tube of aedeagus broad, ventro-distally with a shoe-shaped extension. Vesica short and globular with two cornuti, a larger one at base of vesica being elongated and with smooth surface and four marginal teeth directed caudally, and a smaller one distally with one thorn.
Female genitalia (BM6291) with caudal part of ostium with sclerotized rim, followed by a relatively short sclerotized and ventrodorsally flattened cervix bursae. At the bottom of the pear-shaped bursa copulatrix a small round signum with rose-shaped circular rows of shallow blunt teeth.
Distribution: Southeastern part of Papua New Guinea in the Owen Stanley Range. Reported localities are Dinawa, Mt. Kebea, Aroa River, Owgarra, Biagi, Mambare River, Angabunga River, Avola, Moroka, Mt. Mafulu, Hydrographer Mts.
Examples from the Finisterre Mountain Range are present in the BMNH but have not been checked. This isolated mountain range is far more north than the Owen Stanley Range and it could be that a different species is represented there.

***Monosyntaxis kratkeensis* sp. nov.** (Plate 92 fig. 3, plate 95 figs 1-4)

Monosyntaxis bipunctata: Rothschild (1912: 224) [in part]; De Vos (2009: 3) [in part].

Holotype ♂ BMNH, [Australian] New Guinea, Bantibasa District, Kratke Mts., 4000-5000 ft., vii.1932, F. Shaw Mayer.
Paratypes 3♂ BMNH, same as holotype.

Derivatio nominis: The species is named after the Kratke Mountains where it occurs.
Diagnosis: Fwl. ♂ 14.9-17.5 mm. Externally hard to separate from *M. bipunctata*. The mid-dorsal patch narrower and more curved than in *bipunctata*. Reliable distinguishing characters only in the (male) genitalia, especially in the aedeagus which has different and larger cornuti than in *bipunctata*. Certainly closely related to *bipunctata* which is reflected in the geographic proximity of the distribution areas of both species.
Genitalia: Male genitalia (BM5725) with valvae broad, cucullus with arched costa. Sacculus rather narrow with parallel fold covered with setae. Apical extension of sacculus with truncate apex which carries a crown of thorns. A ridge of small teeth along this extension. Aedeagus short and in general similar to that of *bipunctata* but coecum narrower and with shorter and straighter shoe-shaped extension ventro-distally. The two cornuti on short vesica clearly different, the larger one at base of vesica short with two distinct upright thorns, the distal smaller one shaped like in *bipunctata* but much larger, like a thorn.

Female unknown.
Distribution: Only known from the Kratke Mountains (Eastern Highlands) in Papua New Guinea.

Monosyntaxis honeyi **sp. nov** (Plate 92 figs 4-5, plate 96 figs 1-3, plate 99 figs 3-4)
Monosyntaxis bipunctata: Rothschild (1912: 224) [in part]; De Vos (2009: 3) [in part].

Holotype ♂ ZMAN, Indonesia, Papua, Central Highlands, Kecamatan Abenaho, Pass Valley, 3°51' S – 139°05' E, 1950 m, 11-17.ii.2005, UNCEN-ZMA Expedition 2005
Paratypes 3♂ BMNH, Centr. Dutch N. Guinea, Mt. Goliath, 5-7000 ft., about 139° long., i.1911 [1 ♂], ii.1911 [2♂♂], A.S. Meek; 1♂ KSP, Indonesia, Irian Jaya, Peg. Bintang, Mabilabol, 28.iii.1982, H. van Mastrigt; 1♂ ZMAN, Indonesia, Irian Jaya, Star Mountains, Abmisibil, 2000 m, 19.viii.1984, H. van Mastrigt; 1♀ ZMAN, Indonesia, Irian Jaya, Baliem Valley, Jiwika, 1600 m, 21.x.1993, A.J. de Boer, A.L.M. Rutten & R. de Vos; 6♂, 6♀, Indonesia, Papua, Central Highlands, Kecamatan Nipsan, Walmak, 4°07' S – 139°38' E, 1710 m, 31.i-9.ii.2005, UNCEN-ZMA Expedition 2005 [1♂ & 1♀ CMWM; 2♂ & 1♀ ZMAN; 1♂ & 2♀ BMNH; 1♂ & 1♀ MZB; 1♂ & 1♀ KSP]; 1♀ ZMAN, Indonesia, Papua, Star Mountains, Abmisibil, 1970 m, 4°40' S – 140°34' E, 29.i-9.ii.2005, UNCEN-ZMAN Expedition 2005; 3♂ & 2♀, Indonesia, Papua, Central Highlands, Kecamatan Abenaho, Pass Valley, 3°51' S – 139°05' E, 1950 m, 11-17.ii.2005, UNCEN-ZMA Expedition 2005 [1♂ & 1♀ ZMAN; 1♂, BMNH; 1♂ & 1♀ MZB]; 1♂ ZMAN, Indonesia, Papua, Landikma, Kec. Abenaho, 914 m, 3°49' S – 139°14' E, 18-22.ii.2009, A.J. de Boer, M. Schouten & R. Mambrasar.

Derivatio nominis: The species is named in honour of the collection manager of the Lepidoptera collection in the Natural History Museum in London, Martin R. Honey, who distinguished this species among the *M. bipunctata* material and which led to a more thorough research with the discovery of all other new *Monosyntaxis* species too.
Diagnosis: Fwl. ♂ 14.7-17.3, ♀ 18.2-20.6 mm. Head and patagia pale orange to bone white, vertex orange. Silky shaded white forewings with the vertical or somewhat oblique blackish blue mid-dorsal marking simple, like a dot or straight bar. The distal dark spot usually elongated and not very sharply edged. The hindwing in the male pure white with the costa yellowish, in the female the hindwing is bone-white with extended yellow coloration in the marginal area.
Genitalia: Male genitalia (RV1258) with valvae narrow, cucullus straight and narrow, sacculus gradually narrowing to an apical extension with a ridge of small teeth at innerside, and a club-shaped apex which is slightly bent upwards with very short thorns (in *bipunctata* longer, but longer than in *arfakensis*). Juxta simple, shield-shaped. Aedeagus short, strongly diverging from coecum distally to wide, beaker-shaped, vesica with two large cornuti, both dentated on the upperside with about six to seven sharp teeth directed distally. At the base of the vesica are some chitinous drops with setae.
Female genitalia (RV1262) with antrum caudally narrow sclerotized. A broad and large cervix bursae, upper half of cervix bursae more sclerotized than lower part and gradually transforming into the short and broad ductus bursae. Globular bursa copulatrix of about the same size as cervix bursae. One small oval signum with about twenty coarse thorns at the bottom of the bursa copulatrix.
Distribution: The species is found in the Eastern Central Mountains of Indonesian New Guinea: the Star Mountains and the Jayawijaya Mountains. Recently collected *Monosyntaxis* specimens from Mokndoma (northern Snow Mountains) do presumably belong to *M. honeyi* but this needs confirmation by genitalia research. These specimens are left out of the type series of *honeyi*.

Monosyntaxis fojaensis **sp. nov.** (Plate 92 figs 6-7, plate 96 figs 4-7, plate 99 figs 5-6)
Monosyntaxis bipunctata: De Vos (2009: 3) [in part].

Holotype ♂ ZMAN, Indonesia, Papua, Kab. Sarmi, Peg. Foja, 1650 m, 2°34.5'S 138°42.9'E, 23.xi-7.xii.2005, CI-RAP, leg. H. van Mastrigt.
Paratypes 16♂ & 4♀, same as holotype [6♂ & 1♀ ZMAN; 8♂ & 1♀ KSP; 1♂ & 1♀ MZB; 1♂ & 1♀ BMNH]; 1♂ ZMAN, Indonesia, Papua, Kwerba, Kab. Sarmi, 2°38' S – 138°24' E, 70 m, 29-30.vii.2005, CI-RAP Mamberamo-Foya Exp.

Derivatio nominis: The species is named after the type locality.
Diagnosis: Fwl. ♂ 13.8-16.1, ♀ 15.7-19.3 mm. The smallest of the *bipunctata* complex. Head and patagia bright orange. Shiny silvery white forewings with sharply defined blackish steel blue iridescent spots, the mid-dorsal marking being oblique. Hindwing in male pure white except for the yellowish costa. Hindwings in female pale yellow.
Genitalia: Male genitalia (RV1331) with large uncus extended and bifid at the apex. Tuba analis not much larger than uncus. Valvae rather broad, cucul-

lus with costa arched, sacculus gradually narrowing to an apical extension with club-shaped apex with sharp teeth interiorly, apex slightly bent upwards with longer thorns than in *bipunctata* and *honeyi*. Aedeagus short, horn-shaped with narrow coecum but less constricted than in *bipunctata.* Tube of aedeagus ventro-distally with shoe-shaped extension, smaller than in *bipunctata*. Vesica long and trunk-shaped with two small cornuti, the largest at base of vesica, longitudinal and covered with about ten coarse thorns and three small basal ones, the smallest cornutus at the very end of the trunk with three sharp thorns.
Female genitalia (RV1335) with caudal part of antrum triangularly sclerotized. Cervix bursae large and long, being sclerotized from antrum to base of bursa copulatrix, at right side dorso-ventrally flattened. An irregular shaped signum at the bottom of the bursa with small shallow thorns.
Distribution: The species is probably restricted to the Foja Mountains in Indonesian New Guinea and is found at low and high altitudes. The species was found during the Foja Expedition in 2005 which was organized by the Indonesian Institute of Sciences (LIPI) and Conservation International.

Monosyntaxis kobowrensis **sp. nov.** (Plate 93 figs 1-2, plate 97 figs 1-3, plate 100 figs 1-2)
Monosyntaxis bipunctata: De Vos (2009: 3) [in part].

Holotype ♂ BMNH, Dutch N. Guinea, Mt. Kunupi, Menoo Valley, Weyland Mts., 6000 ft., xi.-xii.1920, C., F. & J. Pratt.
Paratypes 9♂ & 1♀ BMNH, same as holotype: xi.-xii.1920 [4♂ & 1♀], xii.1920-i.1921 [5♂], C., F. & J. Pratt; 1♂ BMNH, Dutch N. Guinea, Dewaro Village, Weyland Mtns., 3500 ft., vi.1920, C., F. & J. Pratt; 2♀ RMNH, Nieuw Guinea Exp. K.N.A.G. 1939, Paniai, 10.ix.1939 & 30.x.1939.

Derivatio nominis: The species is named after its area of distribution, the Kobowre Mountains.
Diagnosis: Fwl. ♂: 15.0-16.8, ♀: 18.0-18.5 mm. Head pale yellow, patagia bone-white to pale yellow. Forewings white, in female darker in apical and marginal fringes. Dark brown to blackish markings rather large, the mid-dorsal one in male a semicircle, in female a curved bar, but less "V"-shaped than in *persimilis*. The distal spot is oval, almost equal in size to the mid-dorsal patch. Hindwings in male pure white, in female bone-white darkening to pale yellow apically.
Genitalia: Male genitalia (BM6263) with narrow valvae, cucullus narrow and stretched with straight costa, sacculus narrow, apical extension with a ridge of small sharp teeth, at apex bent upwards with a group of thorns. Aedeagus rather narrow compared to other species, ventro-distally with a boat-shaped extension, coecum long and narrow. Vesica shoe-shaped with two small cornuti, the basal one being slightly larger, arched and with two thorns, the smaller apical one circular with two thorns.
Female genitalia (RV1340) with cervix bursae sclerotized at the right side and with a collar transforming into the broad ductus bursae. Bursa copulatrix pear-shaped with one small circular signum at the bottom of the bursa, with shallow blunt thorns arranged in a rose-shape.
Distribution: Kobowre Mountains (former Weyland Mountains) in Southwest Papua in Indonesian New Guinea, found at 900-1800 meters. No recent collected specimens are known.

Monosyntaxis arfakensis **sp. nov.** (Plate 93 figs 3-4, plate 97 figs 4-6, plate 100 figs 3-4)
Monosyntaxis bipunctata: De Vos (2009: 3) [in part].

Holotype ♂ ZMAN, Indonesia, Papua Barat, Birdshead Peninsula, Mokwam, 1510 m, 1°06'S – 133°54'E, 6-10.xi.2011, at light, Papua Insects Foundation.
Paratypes 1♀ BMNH, Dutch New Guinea, Ninay Valley, Central Arfak Mts., 3500 ft., ii-iii.1909 [no leg.]; 1♂ & 1♀ BMNH, North N. Guinea, Angi Lakes, Arfak Mts., 6000 ft., i-ii.1914, A., C. & F. Pratt; 3♂ CMWM, Indonesia, Irian Jaya, Manokwari, Arfak, Ngat Biep, river Ngat Valley, 850 m, 18-19.xii.1993, R. Brechlin & K. Cerny; 10♂ & 1♀, same as holotype [4♂ & 1♀ ZMAN; 2♂ KSP; 2♂ MZB; 2♂ BMNH].

Derivatio nominis: The species is named after its distribution area, the Arfak Mountains.
Diagnosis: Fwl. ♂ 15.1-17.0, ♀ 17.1-19.9 mm. Head and patagia bright orange. Forewings silky white but costa with dark scales and apex and costal part of margin with darkly suffused fringes. Black to dark steel blue markings in male rather small, the mid-dorsal one being a semicircle, the distal one a very small spot. Female with much larger markings, almost equally sized. Mid-dorsal patch a semicircle, the distal patch oval. Hindwings in male white with yellow coloration apically, in female pale yellow.
Genitalia: Male genitalia (BM6262, RV1341) robust, with broad valvae. Cucullus broad with strongly arched costa. Sacculus broadly based, gradually narrowing towards club-shaped apex which is bent

upwards. Apical extension of sacculus with a ridge of small sharp teeth, at apex with a group of thorns which are shorter than in any of the other treated species. Aedeagus robust, short and broad with broad coecum. Vesica short with one large cone-shaped cornutus bearing an extension with four teeth resembling a cogwheel.

Female genitalia (RV1342) with broad sclerotized antrum. Cervix bursae large with broad, sclerotized collar and with thinner sclerotization running through the very broad ductus bursae to the globular bursa copulatrix. One small signum at the bottom of the bursa, elongated with three rows of shallow teeth, accompanied by an isolated chitinous drop but this may be variable.

Distribution: Arfak Mountains in the Birdshead Peninsula of Papua Barat, Indonesian New Guinea. It is found at moderate and high altitudes (850-1800 meters) and is locally rather common.

***Monosyntaxis bimaculata* De Vos, 2009** (Plate 93 fig. 5, plate 98 figs 1-3)

Monosyntaxis bimaculata De Vos (2009: 5).

Holotype ♂ ZMAN, "Indonesia Papua, Kab. Sarmi, Kwerba, 2°38.63' S – 138°24.54' E, 29-30.vii.2005, 70 m, CI-RAP Mamberamo-Foya Exp., H. v. Mastrigt.

Paratype 1♂ ZMAN, same as holotype.

Diagnosis: Fwl. 17.0 mm. Head and patagia bone-white. Prothorax black, mesothorax grey-white but dorsally blackish blue with a soft metallic iridescence. Forewing bone-white, not silvery white as in the other species. The rim of the costa basally blackish. Two large dark patches, the inner marking metallic blackish blue, drop-shaped and touching the dorsum, the outer marking dark brown and more or less round. Hindwing of the same colour as forewing without any pattern or fading colours.

Female unknown.

Genitalia: Male genitalia (RV1261) with valvae broad, cucullus arched in the middle, at the apex of the cucullus with a strongly sclerotized rim, sacculus broadly based, narrowing to an apical extension with a short ridge of small teeth and with a short spoon-shaped apex with small thorns, apex curved inwards. Aedeagus very short, strongly diverging from extremely short coecum to wide beaker-shape with a thick worm-like extension ventro-distally. Vesica with one large cornutus, weakly trapezium-shaped with a strong ventral thorn and covered with some coarse warts.

Distribution: Until now only known from low altitude in the Foja Mountains in Papua, Indonesia.

***Monosyntaxis persimilis* Rothschild, 1912** (Plate 93 figs 6-7, plate 98 figs 4-6, plate 100 figs 5-6)

Monosyntaxis persimilis Rothschild (1912: 224); Draudt (1914: 202); Strand (1922: 596); Holloway (2001: 291); De Vos (2009: 4).

Holotype ♂ BMNH, Centr. Dutch N.Guinea [Papua, Indonesia], Mt. Goliath, 5000-7000 ft, about 139 long.[itude], i.1911, A.S. Meek.

Diagnosis: Fwl. ♂ 16-18, ♀ 20-23 mm. Head orange with black vertex, patagia orange, silvery white prothorax caudally black and with a black central spot, tegulae orange with a small black spot and white hairy fringes. Forewing silvery white with two black markings, the mid-dorsal one metallic blackish blue and strongly "V"-shaped pointing outwards, the distal patch dark brown, small and irregular. Hindwing in male pure white with the costa, apical area and fringes along the upper half of the wing suffused with orange-yellow. In the female the hindwing is pale yellow, gradually darkening apically.

Genitalia: Male genitalia (RV1259) with valvae broad, cucullus disc-shaped, forming almost half a circle, sacculus strongly narrowing from broad base to half the valva length, continued by an apical extension with a spoon-shaped apex. A ridge with long sharp teeth at the outer rim of the extension, pointing inwards and increasing in size, at the inwards curved apex a group of long thorns. Aedeagus rather narrow, stretched and of moderate length, gradually broadening and with a boat-shaped extension ventro-distally. Vesica with two small cornuti, basally a larger one with sharp teeth and a small thorn-shaped one distally. At the base of the vesica are numerous chitinous drops with long setae.

Female genitalia (RV1263) with clearly defined broadly based antrum, followed by a broad straight tube which combines the sclerotized cervix bursae and the unsclerotized ductus bursae. Ductus seminalis originating at the base of the cervix bursae. The bursa copulatrix is rather small, globular and contains one oval signum at the bottom of the bursa which is comparatively large with numerous spirals of blunt teeth directed from the center of the signum.

Distribution: The species is mainly distributed in the Central Mountains from west to east through New Guinea, but is, in the Indonesian part, also found in the Paniai area and the Wondiboy Mountains (Wandammen Peninsula).

***Monosyntaxis postfuscata* sp. nov.** (Plate 94 fig. 1, plate 101 figs 1-2)

Holotype ♀ BMNH, British New Guinea, Saiko, Bubu River, Upper Waria River, 5000-6000 ft., ix.1936, F. Shaw Mayer.

Derivatio nominis: The species is named after the dark suffusion of the hindwings which is unusual in this species complex.

Diagnosis: Fwl. ♀ 22.5 mm. Head silky cream-white, patagia orange, tegulae caudally orange, distally white with a black spot. Prothorax black, mesothorax bone-white with two black spots, metathorax dark brown. Abdomen dorsally with pale yellow hairs. Forewings white with costal rim and apical fringes suffused with orange. Base at dorsum with orange-yellow streak. Costa with black subcostal streak. Black markings large with steel blue iridescence. Mid-dorsal marking strongly "V"-shaped, pointed outwards and touching dorsum. Distal patch irregularly shaped, edges not sharply defined. Hindwings dark grey with orange-yellow margins. The wing pattern and the construction of the genitalia indicate a close relationship with *Monosyntaxis persimilis*.

Male unknown.

Genitalia: Female genitalia (BM5726) very similar to that of *persimilis*. The antrum much narrower and the signum almost half the size of *persimilis* with blunt teeth directed to one side of the signum.

Distribution: Only known by one female from the area northwest of the Owen Stanley Range, Waria River.

Key to the *Monosyntaxis* species from New Guinea

1 All spots of more or less equal size and shape (round), ground colour bone-white .... *bimaculata*
- The two black spots on forewing of different shape and size, ground colour white 2

2 Middorsal (inner) spot distinctly chevron-shaped 3
- Middorsal (inner) spot oval or at most comma-shaped 4

3. Spots very large, middorsal spot strongly chevron-shaped, hindwings dark .... *postfuscata* (♀)
- Spots of normal modest size, hindwings white (♂) or yellowish (♀) .... *persimilis*

4 Antennae bipectinate, hindwings white .... 5 (♂♂)
(male of *postfuscata* unfortunately unknown)
- Antennae filiform (finely ciliated), hindwings more or less yellow .... 10 (♀♀)
(females of *bimaculata* and *kratkeensis* unfortunately unknown)

5 Aedeagus with one large cornutus, black spots on forewing rather small .... *arfakensis* (♂)
- Aedeagus with two cornuti 6

6 Aedeagus with two large cornuti of almost equal size .... *honeyi* (♂)
- Aedeagus with two cornuti of different size, distal cornutus much smaller 7

7 Vesica trunk-shaped with distally a crown-shaped cornutus consisting of three spines .... *fojaensis* (♂)
- Vesica not trunk-shaped, cornutus with less than three spines 8

8 Aedeagus with ventro-distal extension stretched, not shoe-shaped .... *kobowrensis* (♂)
- Aedeagus with ventro-distal extension shoe-shaped 9

9. Valva rather narrow, extension of sacculus with club-shaped apex .... *bipunctata* (♂)
- Valva rather broad, extension of sacculus with truncate apex .... *kratkeensis* (♂)

10 Signum irregularly shaped with teeth not clearly defined 11
- Signum regular circular or oval 12

11 Signum is an irregular shaped sclerotized patch with shallow teeth, ductus bursae at one side completely sclerotized .... *fojaensis* (♀)
- Signum small, irregular shaped and broken up in smaller pieces, with few shallow teeth, ductus bursae very broad with sclerotized base .... *arfakensis* (♀)

12 Signum circular, with rose-shaped circular rows of teeth 13
- Signum oval 14

13 Base of ductus bursae completely sclerotized .... *bipunctata* (♀)
- Base of ductus bursae at ventral side sclerotized .... *kobowrensis* (♀)

14 Oval signum with numerous from one side radiated teeth .... *persimilis* (♀)
- Oval signum regularly dentated with four rows of teeth .... *honeyi* (♀)

Revised checklist of all *Monosyntaxis* species

affinis Rothschild, 1912	Malayan Peninsula, Sumatra, Java
arfakensis sp. nov	Arfak mts., Papua Barat
bipunctata (Bethune-Baker, 1904)	Owen Stanley Range, SE Papua New Guinea
bimaculata De Vos, 2009	Foja Mts., Papua
fojaensis sp. nov	Foja Mts., Papua
holmanhunti Hampson, 1914	Malayan Peninsula, Sumatra, Java, Bali, Borneo
honeyi sp. nov	Jayawijaya Mts. and Star Mts., Papua
kobowrensis sp. nov	Kobowre Mts., Papua
kratkeensis sp. nov	Kratke Mts., Papua New Guinea
montanus Schulze, 1910	Luzon, Mindanao (The Philippines)
persimilis Rothschild, 1912	New Guinea
postfuscata sp. nov	Papua New Guinea
radiifera Cerny, 1995	Mindanao (The Philippines)
samoensis (Rebel, 1915)	Samoa
= *samoana* (Gaede, 1925)	
trimaculata (Hampson, 1900)	Borneo

Genitalia slides used	♂	♀
Monosyntaxis arfakensis	BM6262 (BMNH) / RV1341(ZMAN)	RV1342 (ZMAN)
Monosyntaxis bimaculata	RV1261 (ZMAN)	
Monosyntaxis bipunctata	BM6290 (BMNH)	BM6291 (BMNH)
Monosyntaxis fojaensis	RV1331 (ZMAN)	RV1335 (ZMAN)
Monosyntaxis honeyi	RV1258 (ZMAN)	RV1262 (ZMAN)
Monosyntaxis kobowrensis	BM6263 (BMNH)	RV1340 (RMNH)
Monosyntaxis kratkeensis	BM5725 (BMNH)	
Monosyntaxis persimilis	RV1338 (KSP) / RV1259 (ZMAN)	RV1263 (ZMAN)
Monosyntaxis postfuscata		BM5726 (BMNH)

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A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae), with descriptions of a new subgenus *Pilomophas* and a new genus *Nemoplophora*

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Abstract: All parts of the male genitalia characters of the valid species of *Nemophas* Thomson, 1864 are described for the first time. An exception is *Nemophas bennigseni* Aurivillius, 1908 incertae sedis since no male specimens were available for dissection, and, consequently, its taxonomic position could not be clarified. A new genus *Nemoplophora* gen. nov. is described and *Nemoplophora subcylindricus* (Aurivillus, 1927) comb. nov. is transferred from *Nemophas*. *Nemoplophora subcylindricus* comb. nov. appears to be more closely related to the genus *Anoplophora* Hope, 1839, in regards to the short antennae in males and several male genitalia characters. *Nemophas ramosi* Schulze, 1920 is placed in the new subgenus *Pilomophas* subgen. nov. *N. (Pilomophas) ramosi* exhibits unique male genitalia characters, which are used as the main basis for describing the subgenus. A comparative study, including genitalia characters of species from six related genera from the Oriental and Australian regions, clarifies the taxonomic position of *Nemophas* and *Nemoplophora* gen. nov. and the taxonomic borders to related genera. *Nemophas grayi* m. *quinquefasciatus* Breuning, 1943 syn. nov. is considered to be a junior synonym of *N. grayii* (Pascoe, 1859). *Nemophas subterrubens* Heller, 1924 syn. nov. is considered to be a junior synonym of *N. (Pilomophas) ramosi*. *Nemophas subcylindricus* var. *virescens* Aurivillius, 1927 syn. nov. is considered to be a junior synonym of *Nemoplophora subcylindricus* (Aurivillius, 1927) comb. nov. All the valid species of *Nemophas* and *Nemoplophora* gen. nov. are redescribed. A new dichotomous key to the species level is provided, incorporating male genitalia characters, as well as a key to the generic and subgeneric level. The geographical distribution of *Nemophas* and *Nemoplophora* is discussed. *N. ammiralis* Schwarzer, 1931, *N. bennigseni* Aurivillius, 1908 and *N. websteri* Jordan, 1898, have, to our knowledge, not been collected since 1934. It is therefore uncertain if these beautiful species are extant.

Key words: Taxonomy, Cerambycidae, Lamiinae, *Nemophas*, *Nemoplophora*, male genitalia characters, Oriental and Australian region, Asia, Oceania.

Introduction

The main objective of this paper is to provide a detailed description of the male genitalia characters of all 14 valid species in the genera *Nemophas* J. Thomson, 1864 and *Nemoplophora* gen. nov. These characters are used to interpret and clarify the taxonomy of the species, including the subgeneric and generic level. In addition, a comparative study including some related genera is provided to clarify the taxonomic position of *Nemophas* and *Nemoplophora* gen. nov. in a wider context. Since many of the original descriptions are not very detailed, the external characters have been re-examined and relevant redescriptions added. Holotypes and other type series or specimens of the 14 species have been located in museum collections, including types, or type series of synonymised species. Vitali & Nagirnyi (2009) resurrected *Nemophas ramosi* Schulze, 1920 comb. nov. to a valid species. However, the type was thought to be lost (Horn & Kahle 1935; Horn et al. 1990; Lingafelter & Hoebeke 2002). We were unable to find any types, and consequently a neotype has been designated (see details in section "Taxonomy"). *N. ramosi* is placed in a new subgenus: *Nemophas (Pilomophas) ramosi* Schulze comb. nov. A total of 14 species are, as a result of the present revision, considered to belong to the genus *Nemophas*. A new genus *Nemoplophora* gen. nov. is described, and

Nemoplophora subcylindricus comb. nov. is transferred from *Nemophas*.

The taxonomy of *Nemophas* spp. is historically not complicated, with only a few synonyms. Several species have been redescribed (Vitali & Nagirnyi 2009), and transferred from *Nemophas* to *Anoplophora* (Lingafelter & Hoebeke 2002), and from *Nemophas* to *Dolichoprosopus* (Breuning 1943). The old literature also shows that the genus *Nemophas* was used more or less randomly when describing new and large Cerambycidae species. For example, Anton Franz Nonfried (1894) described *Nemophas eupholoides* from Borneo, which was later placed as a junior synonym of *Pseudomyagrus waterhousi* (Gahan, 1888) by Breuning (1961). *Nemophas malachiticus* Nonfried, 1891, is a junior synonym of *Anoplophora medenbachi* (Ritsema, 1881) according to Lingafelter & Hoebeke (2002). In addition, Maurice Pic (1925) described *Nemophas multinotatus* (known from Laos and China), but it is today considered to be an accepted species placed in the genus *Blepephaeus* Pascoe, 1866 (Hüdepohl & Heffern, 2004).

The geographical distribution of the *Nemophas* and *Nemoplophora*

The geographical range of the *Nemophas* species and *Nemoplophora* gen. nov. (Plate 116 fig. 1) covers three separate areas. Area one are the Philippines, area two - the islands between Borneo, Papua New Guinea and Australia, and area three - the island provinces east of Papua New Guinea (mainly the Bismarck Archipelago). Area one: *Nemoplophora subcylindricus* comb. nov. is known only from the islands of Mindanao and Luzon. *Nemophas (Pilomophas) ramosi* comb. nov. is recorded only from the islands Mindanao and Samar. Both these species are the taxonomic "outgroups" and the most different from the rest of the Nemophas species. Area two: A total of 10 *Nemophas* species have been recorded in Indonesia, the Moluccas islands (Maluku islands) and various islands southwest of the Moluccas (e.g. Flores and Timor islands) (Plate 116 fig. 1). This area is the main area of the genus *Nemophas*. Area three: This is the most isolated area of the three, and contains *Nemophas ammiralis* (only Manus Island, Admiralty Islands), *N. bennigseni* (the island of New Britain) and *N. websteri* (the islands of New Hanover and New Ireland). There is no overlap of species between the three areas. No species of *Nemophas* have, so far, been found on the island of New Guinea, although all species occur within "Wallacea" east of the Wallace's Line, and Huxley's modifications of Wallace's Line (Plate 116 fig. 1).

Hua (2002) lists the following species from China: *Nemoplophora subcylindricus* comb. nov. (Sichuan province), *Nemophas subterrubus* (= *N. ramosi*) (Sichuan province), and *N. trifasciatus* (Sichuan and Yunnan provinces). These species are briefly mentioned without any source details in Hua (2009). Löbl and Smetana (2010) also list these three species from China, referring to Hua (2002). Until more documentation is available, we consider the mentioned records in China as based on mistakes, or specimens imported with wood, and not established populations.

N. ammiralis Schwarzer, 1931, *N. bennigseni* Aurivillius, 1908 and *N. websteri* Jordan, 1898, have, to our knowledge, not been collected after 1934. It is therefore uncertain if these beautiful species are extant.

Material and methods

The nomenclature follows (when relevant) Heller (1919, 1924), Breuning (1943, 1961), Hüdepohl (1983), Lingafelter & Hoebeke (2002) and Vitali & Nagirnyi (2009).

Specified information on examined specimens is mentioned under each species in the section "Taxonomy". Measurements included are total body length and width in mm of the examined specimens.

Genitalia characters: In the present study, we have included the sclerotized parts of the male terminalia: the aedeagus, endophallus with the sclerites inside the median phallomer and the internal sac, tegmen with parameres and median lobe, and tergite VIII. The internal sac of the males was embedded in 100% glycerol and photographed using a regular light microscope. This method is described in detail by Wallin et al. (2009). Other parts of the male genitalia and the female genitalia were dry mounted. The terminology used is based on Lingafelter & Hoebeke (2002), Yamasako & Ohbayashi (2011), Lin et al. (2009) and Ślipiński & Escalona (2013).

Acronyms for scientific collections:

ANSP – Academy of Natural Sciences, Philadelphia, U.S.A.;

BMNH – The Natural History Museum, London, United Kingdom;

CHW – Collection Henrik Wallin, Uppsala, Sweden;
CUN – Collection Ulf Nylander, Valbo, Sweden;
FCNMB – Frey Collection and Natural History Museum, Basel, Switzerland;
FSSF – Forschungsinstitut Senckenberg, Frankfurt am Main, Germany;
FSSD – Forschungsinstitut Senckenberg, Dresden, Germany;
IRSNB – Royal Belgian Institute of Natural Sciences, Brussels, Belgium;
MFN – Museum für Naturkunde, Leibniz Institute for Research on Evolution and Biodiversity at the Humboldt University Berlin, Germany;
MNHN – Muséum National d'Histoire Naturelle, Paris, France;
NHRS – The Swedish Museum of Natural History, Stockholm, Sweden;
NHMW – Naturhistorisches Museum Wien, Austria;
NMB – Natural History Museum, Basel, Switzerland;
SDEI – Deutsches Entomologisches Institut, Müncheberg , Germany;
USNM – National Museum of Natural History, Smithsonian Institution, Washington D.C., U.S.A.;
ZMA – University of Amsterdam, Zoological Museum of Amsterdam, The Netherlands.

Additional examined materials from related genera

Anoplophora elegans (Gahan, 1888)
Thailand: 1♂ CHW, 32 mm, Wiang Papao, Chiang Rai, 2004-06-20/25.

Anoplophora granata Holzschuh, 1993
Thailand: 1♂ CHW, 30 mm, Chiang Rai, Wiangpapoa, 2008-05.

Anoplophora mamaua Schultze, 1923
The Philippines: 1♂ CHW, 38.5 mm, South Luzon, Mindoro, Mount Halcon, 2008-05.

Agnia pulchra Aurivillius, 1891
Indonesia: 1♂ CHW, 20.5 mm, the Moluccas (Maluku Islands), Bacan Island, 2005-10.

Cornuscoparia annulicornis (Heller, 1897)
Papua New Guinea: 1♂ CHW, 34 mm, the island of New Guinea, Morobe Province, Wau Valley 1200 m, 2006-01-06.

Dolichoprosopus leuciscus (Pascoe, 1866)
Indonesia: 1♂ CHW, 30 mm, the Moluccas (Maluku Islands), Halmahera Island, 2009-03; 1♂ CHW, 30 mm, Halmahera Island, 2009-05.

Iothocera tomentosa (Buquet, 1859)
Indonesia (Papua): 1♂ CHW, 33.5 mm, the island of New Guinea, Timika, 2003-08.

Mimohammus biplagiatus Breuning, 1950
Malaysia: 1♂ CUN, 29 mm, Cameron Highlands, Ipoh, leg. M.Yeh, 1998-04; 1♂ CUN, 24.5 mm, Cameron Highlands, Ipoh, leg. M.Yeh, 1998-04, det. K-E. Hüdepohl.

Pseudonemophas baluanus (Aurivillius, 1923)
Malaysia: 1♂ CHW, 31.5 mm, N Borneo, Sabah, Mt. Trus Madi 1500-2000m, 2007-06.

Pseudonemophas versteegi (Ritsema, 1881)
Thailand: 1♂ CHW, 26.5 mm, Wiang Papao, Chiang Rai, 2008-07.

Taxonomy
Genus ***Nemophas* Thomson, 1864: 75**
Subgenus ***Nemophas* s. str. Thomson, 1864: 75**
Type species: *Nemophas batoceroides* Thomson, 1864

All species of *Nemophas* spp. are medium-sized to very large. The majority have a body length about 30 mm. *N. batoceroides* is the largest species of the genus, reaching a body length in females of nearly 50 mm. Body shape is sub-cylindrical with body tapering to sub-parallel. Elytra are convex and elongated, about 2.8-3.2x longer than wide, with evenly rounded epipleurons. Males have very long antennae, up to a total length of 120 mm.

Redescription. Antennae long, 2-3.5x longer than body in males and about 1.5x longer than body in females. The last antennomere in males is about 2x the length of the penultimate. Antennae are cylindrical, smooth and black with relatively fine to very fine reticulation. Scape is robust and apical process (cicatrix) with a distinct lateral margin which is finely reticulated, and with very small punctures forming a mesh-like pattern. Scapes are also supplied with additional larger, scattered (oblique or distinct) punctures, with a distance between about 3-4x the width of one puncture, but more dense at base (Plate 119 fig. 11). Scapes often have numerous fine and short black setae. The 3rd and 4th antennomeres have a few black setae beneath. An exception is the punctures of scapes in *N. websteri,* which are very coarse and deep, confluent distally and medially, with the distance between punctures 1-2x the width of each puncture (Plate 119 fig. 13). Head: Mostly black, but several of the species have coloured pubescence, especially on frons. Eyes: Lower eye lobes (below scape) are large and only slightly elongated, about twice as long as gena below. Pronotum: Smooth and often covered with coloured pubescence, except a narrow, glabrous and longitudinal line anteromedially. *N. cyanescens* and *N. trifasciatus* both have entirely black pronotum. Pronotum is provided with an anterior and a posterior deep transversal impression. The lateral pronotal spines are acute and predominantly straight. *N. bennigseni* and *N. websteri* are exceptions and have lateral spines strongly curved upwards at apex. Elytra: Colour varying among species, elytral surface with or without transversal bands. Scutellum is predominantly black, and exceptions are found in *N. bennigseni*, *N. websteri* and *N.* (*Pilomophas*) *ramosi* comb. nov. where it is yellowish to orange. Elytral apices evenly rounded. Ventral part of the body: Mesosternum, metasternum and abdominal ventrites often have dense pubescence in various colours with a species specific pattern. Mesosternal process is flattened at base and narrow, often with weak transversal ridges medially, and a small rounded tubercle at apex. Last visible abdominal segment in the females is pointed. Legs: All legs glabrous, but sometimes with fine whitish pubescence anteriorly. Front legs in males are moderately elongated and anterior femora in males are approximately 1.5x the length of the pronotum and head combined. Tarsi are mostly glabrous, but male front tarsi are without spines or projections. Claws have straight inner margin (i.e. not saw toothed), inner surface have very fine longitudinal furrows.

Remarks: Common key characters used to separate species of *Nemophas* have, so far, only included external characters (Heller 1919; Vitali & Nagirnyi 2009). The first key by Heller (1919) includes some useful external characters comprising the extent and colour of pubescence on prosternum, mesosternum, metasternum and abdominal ventrites. These characters have been incorporated in the present dichotomous key. We adopted the nomenclature by Lingafelter & Hoebeke (2002) where several species of *Nemophas* were transferred from *Anoplophora*, and the most recent nomenclature used by Vitali & Nagirnyi (2009).

Distinction of genera of Lamiinae, from the Oriental and Australian region, related to *Nemophas*

The species of *Nemophas* differ from species of *Batocera* due to the lack of spines and projections on the male front tarsi and elytral apices. The antennae in both sexes of *Nemophas* Thomson, 1864 are smooth, and do not have spines, apart from punctuation or heavy sculpturing on scape and basal antennomeres. The scape cicatrix is projecting. Moreover, the body of *Nemophas* spp. is much smaller than in both *Batocera* and *Rosenbergia*. In addition, the latter two genera lack well developed sclerites inside the internal sac in males. The species of *Rosenbergia* Ritsema, 1881 are characterized by having extensive pubescence covering most of the body.

Other more distantly related Asian cerambycid genera, where males have very long antennae and to some extent may resemble *Nemophas* are: *Agnia* Newman, 1842, *Iothocera* Thomson, 1864, *Pseudonemophas* Breuning, 1944 and *Mimohammus* Aurivillius, 1911. However, these genera lack the dorsal and ventral body colours that are unique to *Nemophas*. The genus *Iothocera* consists of one species that occurs in the Australian region. It is easily distinguished from *Nemophas* by the distinctly granulated row on the apical third of epipleuron that reaches humeri, and the uniformly brownish pubescence on the entire body. The genus *Nemophas* is also easily distinguished from *Dolichoprosopus,* since the latter genus is characterised by the flattened and smooth mesosternal process, rounded scape cicatrix, and particularly the narrow head with elongated eye lobes and frons. Species of the closely related genus *Anoplophora* Hope, 1839 (Plate 109 figs 2, 5) also have well developed sclerites inside the internal sac in males, although less sclerotized than in *Nemophas*. *Nemophas* spp. are separated from *Anoplophora* by the following external characters, as outlined by Lingafelter & Hoebeke (2002): “the front legs of males are elongated, the posteromedial callus on pronotum is not raised, antennae not annulated, the last abdominal segment in females is pointed, the last antennomere in males is greater than twice the length of the penultimate, and the antennae extended beyond the elytra at approximately antennomere 5-6, the anterior femora of males of *Nemophas* are approximately 1.5x the length of the pronotum and head combined, and mesosternal process mostly narrow and only slightly raised anteriorly (the mesosternal process in *Anoplophora* is often widely elevated)”. The last genus used in the male genitalia study is *Cornuscoparia* Jordan, 1890 from Papua New Guinea, also represented by single species. It is characterized by an elongated head with eye lobes more than twice as long as wide, and the lateral pronotal spines reduced to short, rounded tubercles.

We have no information available on the biology of *Nemophas* species, as the larvae are still undescribed. The host tree preference is unknown, unlike species of *Anoplophora* that have been dealt with in detail by Lingafelter & Hoebeke (2002).

The species of *Nemophas* subgenus *Nemophas* s. str.

Nemophas (s. str.) ***ammiralis*** **Schwarzer, 1931**
(Figs 1-2, 33-34, 69, plate 102 figs 1, 2, 4, 5, plate 117 fig. 17, plate 118 fig. 1)

Nemophas ammiralis Schwarzer, 1931: 66, fig. 15. Type locality: Admiralty Isl. - Lingafelter & Hoebeke 2002: 143 (revived); Vitali & Nagirnyi 2009: 472.
Anoplophora ammiralis: Breuning, 1943: 291, fig. 178. - Breuning 1961: 339.

Holotype ♂ FSSF: Papua New Guinea (Island Provinces): length 33 mm, Typus, *Nemophas ammiralis* Schwarzer 1930, Admir. Ins., Stat: Manus, Leg. Dr. L. Lohn (Fig. 1).
Additional material: 1♀ FCNMB, length 30 mm, labelled "I. Manus" (Bismarck Archipelago), det. S. Breuning.

Diagnose: A relatively large and broad species, with body approximately 2.7x longer than wide. Male length 33 mm, width 12 mm; female length: 30 mm, width 11 mm. The overall black body with contrasting whitish, transversal bands on elytra, and the very long antennae in males (especially the last antennomere), easily separates this species from all other species of *Nemophas*.
Redescription. Antennae: Scape is coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae are very long, longer than body with five to six antennomeres in males (and 3.5x longer than the entire body), and with three to four antennomeres in the female. Last antennomere in the male is more than 2x the length of the penultimate. Head: Very fine brownish pubescence exposing the black integument. Frons has similar pubescence as remaining parts of the head. Pronotum: Black, with only weak yellowish pubescence, more dense laterally. Elytra: Basal half of elytra have rough granulation, remaining surface is dull. Scutellum is black with only weak, yellowish pubescence laterally. Integument is black. Elytra have medially whitish, transversal pubescence forming bands and larger spots and numerous smaller whitish spots towards apices. The dorsal, as well as ventral (metasternum and abdominal ventrites), colour patterns and pubescence of the female are similar to those of the male, although the white transversal bands on elytra are more oblique medially. Ventral part of the body: Mesosternal process is broad and flattened in both sexes. Pro-, meso- and mesosternum (except coxae), and all visible abdominal ventrites are black, and covered with fine whitish pubescence (especially on the posterior parts of abdominal segments). The newly hatched (teneral) males have more brownish abdominal ventrites. The teneral holotype ♂ has more brownish integument, with only weak brownish pubescence along the posterior margins (Plate 102 fig. 4). Last abdominal segment in the female is strongly pointed (Plate 102 fig. 5). Last sternite is covered with fine dense whitish hairs and long brown setae. Legs: Black with fine, brownish pubescence on posterior part of tibiae and tibiae are slightly curved towards posterior margin. Front tibiae of males are much longer and front tarsi much broader, than in females. Male genitalia. Aedeagus: 5.0 mm long and evenly curved towards apex. Dorsal ridge is as wide as ventral ridge, and both ridges rounded at apex with yellowish colour (Figs 1-2). The two yellowish and crescent-shaped sclerites at the proximal end of the basal phallomer are narrow and weakly folded (Plate 118 fig. 1). Median phallomer has a series of yellowish, large punctures on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 17). The basal segment is membranous, tubular, slightly cone-shaped and evenly covered with triangular-shaped microspinules (as in plate 117 fig. 17). Median segment is membranous and short Terminal segment is strongly elongate (as long as the apical and median segments combined), well sclerotized and relatively broad. The total length of basal, median and terminal segments is approximately 2.0 mm. Tegmen: 4.0 mm long, base of tegmen extended and curved dorso-ventrally on middle. Parameres: Short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 33). Base of inner margin has a distinct extension from each paramere, projecting forward forming a "tooth" (Fig. 34). Apex evenly rounded along poste-

rior margin with scattered fringes of relatively short, yellowish to brownish hairs, well concentrated at the edge of apex. Ventral surface of parameres with scattered punctures and fine hairs concentrated at apex, but without micro-reticulation. Tergite VIII: 2.0 mm long and convex, with yellowish to brownish pigmentation, posterior margin broadly rounded, and covered with short, fine yellowish hairs and a few brownish setae distally towards the posterior margin (Fig. 69). Surface has very weak micro-reticulation medially.

Distribution: Only known from Manus Island (Admiralty Islands), Papua New Guinea (Island Provinces; plate 116 fig. 1).

Remarks: This species was, to our knowledge, not been collected after 1931. According to Schwarzer (1931) the female was unknown to him. However, the female preserved at FCNMB is not supported with any date apart from labels with the following data: "I. Manus" and "*Anoplophora ammiralis* Schwarzer, Breuning det." We have not been able to confirm whether or not it was collected later than the holotype, and we assume that only two specimens of this species have been collected.

Nemophas (s. str.) ***batoceroides*** **Thomson, 1864** (Figs 3-4, 35-36, 70, plate 102 figs 7-8, plate 103 figs 1, 4, plate 109 figs 3, 6-7, plate 110 figs 1-3)

Nemophas batoceroides Thomson, 1864: 75. Type locality: Timor. - Pascoe 1866: 274; Lacordaire 1869: 307; Aurivillius 1921: 76; Heller 1919: 102; Breuning 1943: 278; Breuning 1961: 336; Vitali & Nagirnyi 2009: 473.

Lectotype ♂ MNHN: 43 mm, Timor, ex. coll. James Thomson (Fig. 33).

Paralectotypes: 1♀ MNHN: 42 mm, Timor, ex. coll. James Thomson; 1♀ ANSP: 44.7 mm,Timor Island, Malay Arch., J. Thomson collection, "Type", preserved at (Fig. 32).

Additional material: 1♂ CUN, 39 mm, Timor Islands, 1997-11-10; 1♀ CUN, 44 mm, Timor Islands, 1997-11-10; 1♂ CUN, 46 mm, Timor Islands, 1991-08; 1♂ CHW, 44 mm, Timor, 2004-11; 1♂ CHW, 43 mm, Timor, Mount Mutis-Timor, 2006-04; 1♀ CHW, 47 mm, Timor Islands, 1994-02; 1♀ CHW, 47.5 mm, Timor, Mount Mutis-Timor, 2006-04; 1♀ CHW, 41.2 mm, Timor, 2004-11.

Remarks: The lectotype (Plate 110 figs 1-3) has been designated from syntypes corresponding to the original description, and preserved at MNHN. The type label was attached by René Oberthür when he acquired the J. Thomson collection (G. Tavakilian, personal communication). Two paralectotypes have been designated: a female preserved at MNHN with collection data corresponding to the male lectotype, and another female from the collection of J. Thomson, preserved at ANSP (Plate 109 figs 3, 6-7).

Diagnose: This is the largest species of the genus *Nemophas* with body approximately 3x longer than wide in males, and 2.8x longer than wide in females (Plate 102 figs 7-8, plate 103 figs 1, 4). Males: length 39-46 mm, width 14.5-15 mm; females: length 41.2-47.5 mm, width 14-17 mm. The distinctive orange pubescence on prothorax dorsally, and ventrally on pro- and mesothorax and all visible abdominal ventrites, in combination with the contrasting black elytra and head, easily distinguish this species from all other species of *Nemophas*.

Redescription. Antennae: Scape is coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six antennomeres, and in females relatively long, longer than body with about 3-4 antennomeres. Head: Covered with very fine and dense, yellowish pubescence and a few scattered setae, resulting in a very dull (micro-reticulated) grey to green integument on the entire head (Plate 115 fig. 2). Pronotum: Pronotal disc (except the apex of lateral spines and a small rounded glabrous spot medially) covered with dense orange pubescence. The lateral pronotal spines are straight. Elytra: Basal half of elytra (including humeri) is covered with numerous rounded granulae, and medially with coarse and scattered punctuation that is distinctly weakened towards apex. Elytra are black, with scattered fine, brownish hairs often distributed in patches (at least in large specimens). Scutellum is completely covered with very fine, brownish pubescence. Integument is black. Ventral part of the body: Last abdominal ventrite in female is pointed, and distinctly notched on the middle (Plate 103 fig. 4). Pro- meso- and metasternum, and all visible abdominal ventrites, are entirely covered with very dense, dark orange to red pubescence (Plate 102 fig. 8, plate 103 fig. 4). Mesosternal process relatively narrow and covered with pubescence laterally. Legs: Black, ventrally with very fine whitish pubescence. Male genitalia. Aedeagus: 7.0 mm long, weakly curved towards apex. Dorsal ridge is as wide as ventral ridge, and both ridges rounded at apex (Figs 3-4). Colour yellowish to brown. The two yellowish and crescent-shaped sclerites at the proximal end of the basal phallomer are narrow, and folded (Plate 118 fig. 2). Median phallomer has a series of yellowish and

large punctures on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in Plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 18). Basal segment is membranous, tubular, strongly cone-shaped and densely covered with triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongate (longer than the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 3.2 mm. Tegmen: 7.0 mm long with the base of tegmen extended and strongly curved dorso-ventrally on middle (Fig. 35). Parameres: Short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 36). Base of inner margin has a very distinct extension from each paramere, projecting forward forming a tooth-like plate (Fig. 36). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres have scattered punctures and fine hairs. Surface is shining due to lack of micro-reticulation on parameres. Tergite VIII: 4.3 mm long and elongated, with brownish pigmentation, posterior margin broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 70). Surface is shining due to no micro-reticulation medially.
Distribution: Indonesia, the islands of Alor and Timor (Plate 116 fig. 1).

Nemophas **(s. str.)** ***bennigseni*** **Aurivillius, 1908 incertae sedis** (Plate 102 figs 3, 6, plate 104 fig. 7)

Nemophas bennigseni Aurivillius, 1908: 215. Type locality: Herbertshöhe (New Britain). - Aurivillius 1921: 76; Lingafelter & Hoebeke 2002: 143 (revived); Vitali & Nagirnyi 2009: 473.
Anoplophora benningseni (Aurivillius, 1908): — Breuning 1943: 291, fig. 179; Breuning 1961: 339.

Holotype ♀ SDEI: length 35 mm, Herbertshöhe, New Britain, ex. coll. R. von Bennigsen (1824-1902), no dates on labels.
Additional material: 2♀ FCNMB, Neu Pommern (New Britain), no dates on labels.

Remarks: This species was recently transferred from the genus *Anoplophora* to *Nemophas* (Lingafelter & Hoebeke 2002). We were not able to locate any male specimen in museum collections. A male is necessary for a closer examination in order to confirm, whether or not, this species actually belongs to *Nemophas*. The external characters (especially the colour pattern on pronotum and elytra, the broad mesosternal process and the curved pronotal spines) indicate that this species may be placed in a separate genus. Consequently, we consider this species to be incertae sedis due to the lack of an available male specimen. We could only locate the three examined female specimens in museum collections. The species is, to our knowledge, not collected for more than 100 years, and was described from a specimen collected before 1908.
Diagnose: A relatively large and elongated species, with body approximately 2.9x longer than wide (Plate 102 figs 3, 6, plate 104 fig. 7). Female: length 35 mm, width 12 mm. The distinctive yellowish spots on pronotum and elytra, together with the lack of transversal bands on elytra, easily separates this species from all other species of *Nemophas*. The lateral pronotal spines are strongly curved upward, and this is a character this species only shares with *N. websteri*.
Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in the females are relatively long, longer than body with about three antennomeres. Head: Frons (and head) is covered with dense, yellowish pubescence, apart from a small medio-lateral glabrous and black area dorsally. Pronotum: Covered with dense yellowish pubescence, with exception of the lateral spines and a broad longitudinal area medially, which are glabrous. The remaining integument on pronotal disc is black with glabrous, shining surface. The lateral pronotal spines are strongly curved upward towards apex. Elytra: Basal half of elytra have fine, scattered punctures, and smooth and shining surface. Scutellum is completely covered with dense, yellowish pubescence. Integument is black. Entire elytra have approximately 20 scattered yellowish spots varying in size, and medially forming two irregular and transversal bands (particularly on epipleuron). Ventral part of the body: Pro-, meso- and metasternum, but not coxae, are covered with yellowish pubescence (at least posteriorly). Abdominal ventrites black with sparse yellowish pubescence along the posterior margin (Plate 102 fig. 6). Mesosternal process is broad, flattened and covered with yellowish pubescence. Last abdominal segment in the female is strongly pointed and supplied with dense brownish pubescence on the apical margin (Plate 102 fig. 6). Legs: Black with very fine yellowish pubescence ventro-

laterally.
Distribution: Only known from the island of New Britain, Papua New Guinea (Island Provinces: plate 116 fig. 1).

Nemophas (s. str.) ***bicinctus*** **Lansberge van, 1880**
(Figs 5-6, 37-38, 71, plate 103 figs 2, 3, 5-6, plate 110 figs 4-5, plate 115 fig. 3, plate 117 fig. 19, plate 118 fig. 3, plate 119 fig. 11)

Nemophas bicinctus Lansberge van, 1880: 137. Type locality: Sulawesi Island. - Heller 1919: 102; Aurivillius 1921: 76; Breuning 1943: 279; Breuning 1961: 336; Vitali & Nagirnyi 2009: 473.

Holotype ♀ MNHN: 34.5 mm, Sulawesi (Celebes) Island, no dates on labels (Fig. 34).
Additional material: 1♀ CUN, 23 mm, Sulawesi, 2001, leg. A. Hasan; 1♂ CUN, 40 mm, Peleng Isl., 1996-06, leg. L. Hart; 1♀ CUN, 36 mm, Sulawesi, 2001, leg. A. Hasan; 1♂ CUN, 40 mm, Peleng Isl., 1996-06, leg. L. Hart; 1♂ CHW, 37 mm, Celebes Island (Sulawesi), Peleng, 2007-10; 1♀ CHW, 39 mm, Celebes Island (Sulawesi), Peleng, 2005-04; 1♂ CHW, 33.5 mm, E. Sulawesi, Peleng, Banggai Island, 2005-04; 1♀ CHW, 33 mm, Celebes Island (Sulawesi), Peleng, 2007-10.

Diagnose: A relatively large and elongated species Body of the males are approximately 3x longer than wide, and 2.9x longer than wide in females (Plate 103 figs 2, 3, 5-6). Male: length 33.5-40 mm, width 11.5-13 mm; female: length 23-39 mm, width 11.5-13.5 mm. *N. bicinctus* has a distinctive yellowish patch on frons, extended onto antennal tubercles. Combined with the yellow transversal bands on elytra and the restricted yellow pubescence on the visible abdominal ventrites, it is easy to separates this species from most of the other species of *Nemophas*. The colour patterns on pronotum and elytra resemble, to some extent, those of *N. rosenbergii* and *N. tricolor*.
Redescription. Antennae: Scape is coarsely reticulated, and shallow punctures (Plate 119 fig. 11). Antennae in males are very long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Dorsally and laterally black. Frons is covered with fine bright yellowish pubescence, forming a distinct rectangular patch, extending onto antennal tubercles (Plate 115 fig. 3). Pronotum: Anterior 2/3 of pronotum is covered with dense yellowish pubescence, with about 12 longer, black setae along the posterior margin of the yellow area. The posterior 1/3 has very fine brownish pubescence, forming a slightly concave area reaching the base of lateral spines on pronotum. The lateral pronotal spines are straight. Elytra: Elytral surface (where exposed) shining with a weak blue metallic lustre. Anterior part of elytra (between scutellum and humeri) often has yellow pubescence. The remaining part of elytra has two distinct yellow bands and a narrower band towards apices. The areas between the yellow bands are about as broad as the adjacent yellow band. Scutellum is completely covered with very fine, dark brown pubescence. Humeri is supplied with scattered rounded granulae, medially with coarse and evenly distributed punctuation, and much finer punctuation on the apical 1/3 (between the yellowish transversal bands). Ventral part of the body: Pro-, meso- and metasternum (except coxae), and medially only on first 1-3 visible abdominal ventrites, are covered with very dense, yellowish pubescence (Plate 103 figs 5-6). Last abdominal ventrite in female is slightly pointed and notched on the middle (Plate 103 fig. 6). Mesosternal process is relatively narrow, with a small tubercle anteriorly. Legs: Black, at the most with very fine whitish pubescence laterally on each femur. Male genitalia. Aedeagus: 5.5 mm long and almost straight towards apex. Dorsal ridge is as wide as ventral ridge and dorsal ridge has a weak longitudinal furrow near apex. Apex is notched on the middle (Figs 5-6), which is unique for this species. Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are narrow and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 3). Median phallomer has a series of yellowish, large punctures on the smooth membrane projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 19). Basal segment is membranous, tubular, strongly cone-shaped and relatively densely covered with triangular-shaped microspinules. Median segment is membranous, short. Terminal segment is strongly elongate (much longer than the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 2.5 mm. Tegmen: 6.0 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 37). Parameres: Short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 38). Base of inner margin has a very distinct extension from each paramere projecting forward forming a “tooth” (Fig. 38). Apex evenly rounded along posterior margin with scattered fringes of relatively short, brownish

hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. Surface has distinct micro-reticulation on parameres. Tergite VIII: 3.0 mm long, with brownish pigmentation, posterior margin broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 71). Surface medially has coarse punctures and distinct micro-reticulation.
Distribution: Only known from Indonesia on the island of Sulawesi (= Celebes) and Peleng Island: part of Banggai Island east of Sulawesi (Plate 116 fig. 1). This species may be restricted to Peleng Island, since specimens labelled “Celebes” lack further locality data.

Nemophas (s. str.) ***cyanescens* Jordan, 1898** (Figs 7-8, 39-40, 72, plate 103 figs 7-8, plate 104 figs 1, 4, plate 110 figs 6-8, plate 117 fig. 20, plate 118 fig. 4, plate 119 fig. 5)
Nemophas cyanescens Jordan, 1898: 419. Type locality: Kei Toeal, Kei (= Kai, Key) Islands - Aurivillius 1921: 76; Breuning 1943: 278; Breuning 1961: 336; Vitali & Nagirnyi 2009: 473.
= *Nemophas atrocyaneus* Heller, 1919: 100. - Heller 1919: 102; Heller 1924: 165 (synonymy); Aurivillius 1921: 76; Breuning 1943: 278; Breuning 1961: 336.

Lectotype ♂ MNHN: 38 mm, Little Kei (H. Kühn), ex. coll W. Rothschild, 1899, January-March 1896, leg. H. C. Webster.
Additional material: 1♂ CUN, 32 mm, Kei Islands, 2008-08; 1♀ CUN, 32 mm, Kei Islands, 2008-08; 1♂ CHW, 39.5 mm, Kei Islands, 2008-11; 1♂ CHW, 36.5 mm, Kei Islands, 2009-03; 1♀ CHW, 37.5 mm, Kei Islands, 2009-03; 1♀ CHW, 37 mm, Kei Islands, 2008-11; 1♀ NHRS, 38 mm, Kei Islands, No. 5765 E94; 1♀ CHW, 37 mm, Kei Islands; 1♂ NHRS, 37 mm, Kei Islands, No. 5764 E94.

Remarks: The lectotype ♂ has been designated with the following collection data: Little Kei (H. Kühn), ex. coll W. Rothschild, 1899, January-March 1896, leg. H. C. Webster, preserved at MNHN (Plate 110 figs 6-8).
Diagnose: A relatively large and elongated species, with body approximately 2.9x longer than wide in males, and 3x longer than wide in females (Plate 103 figs 7-8, plate 104 figs 1-4). Males: length 32-39.5 mm, width 12-13.5 mm; females: length 37-37.5 mm, width 12-12.5 mm. The metallic blue elytra in combination with black head and pronotum, the orange mesosternum and abdominal ventrites, easily separates this species from all other species of *Nemophas*.
Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Uniformly black, only covered with extremely fine brownish pubescence and a few larger setae, leaving the black integument exposed. Pronotum: Pronotum is black, and covered with very fine brownish pubescence medially. Both the anterior and posterior transversal impressions are clearly visible. The lateral pronotal spines are almost straight. Elytra: Elytra are glabrous i.e. without transversal bands, shining with a distinct dark blue metallic lustre. Scutellum is covered with very fine punctures and scattered fine, dark brown pubescence. Humeri has scattered rounded granulae, medially with coarse and evenly distributed punctuation, and much finer punctuation on the apical 1/3. Ventral part of the body: Pro-, meso- and mesosternum (except coxae), and all visible abdominal ventrites, are covered with very dense, orange pubescence (Plate 103 figs 4, 8, plate 104 figs 1-4). Abdominal ventrite 5 in females is oblique and shining medially. Mesosternal process is relatively narrow and slightly raised anteriorly. Last abdominal ventrite in female is narrowly pointed and notched on the middle (Plate 104 figs 1-4). Legs: Black, with at most very fine whitish pubescence laterally on each femur. Male genitalia. Aedeagus: 5.5 mm long, relatively narrow, weakly curved towards apex, dorsal ridge as wide as ventral ridge, both ridges rounded at apex (Figs 7-8). Colour yellowish to brown. The two yellowish and crescent-shaped sclerites are narrow and folded at the proximal end of the basal phallomer (Plate 118 fig. 4). Median phallomer has a series of yellowish, large punctures on the micro-reticulated membrane, projecting inward as needle-shaped structures along the lateral margin (Plate 119 fig. 5). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 20). Basal segment is membranous, tubular, more or less rectangular, and densely covered with large triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongate (much longer than the apical and median segments combined), well sclerotized and relatively broad. The total length of basal, median and terminal segments is approximately 2.0 mm. Tegmen: 5.1 mm long, with base of tegmen extended and strongly curved dorso-ventrally on

middle (Fig. 39). Parameres: Short and flattened dorso-ventrally, weakly separated medially along inner margin and towards apex (Fig. 40). Base of inner margin has a very distinct extension from each paramere projecting forward forming a "tooth" (Fig. 40). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres with scattered punctures and fine hairs. Surface is shining due to no distinct micro-reticulation on parameres. Tergite VIII: 3.5 mm long, with brownish pigmentation, posterior margin almost straight or weakly concave, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 7). Surface medially has coarse punctures and very weak micro-reticulation.

Distribution: Indonesia, Kei (= Kai, Key) Islands (Plate 116 fig. 1).

Note: We have not been able to find the holotype or any other types of *N. atrocyaneus*. However, it was made clear by Heller (1924) that he considered *N. atrocyaneus* to be a junior synonym of *N. cyanescens,* thus we find it likely that he examined specimens of both species.

Nemophas (s. str.) ***forbesi* Waterhouse, 1884** (Figs 9-10, 41-42, 73, plate 104 figs 2-3, 5-6, 8, plate 111 fig. 1, plate 117 fig. 1, plate 118 fig. 5)

Nemophas forbesi Waterhouse, 1884: 218, pl. 16, fig. 5. Type locality: Maroe (Maru) and Larat Islands. - Heller 1919: 102; Aurivillius 1921: 76; Breuning 1943: 279, fig. 155; Breuning 1961: 336; Vitali & Nagirnyi 2009: 472.

Lectotype ♂ BMNH: 42 mm, Timor Islands, Maroe and Larat.

Additional material: 1♂ NHRS, 37 mm, Tanimbar, Sunda Isl, No. 5768 E94; 1♂ CHW, 31 mm, Tanimbar Islands, 2008-09; 1♂ CHW, 27.5 mm, Tanimbar Islands, Yamdena Island, Lorulum Village environs, 2007-01; 1♂ CHW, 42 mm, Tanimbar Islands, 2009-03; 1♂ CHW, 42.0mm, Tanimbar Islands, Yamdena Island, Lorulum Village environs, 2008-01; 1♀ CHW, 31 mm, Tanimbar Islands, Yamdena Island, Lorulum Village environs, 2008-01; 1♀ CHW, 42 mm, Tanimbar Islands, 2009-03; 1♀ CHW,, 31 mm, Tanimbar Islands, Yamdena Island, Lorulum Village environs, 2007-01; 1♂ CHW, 42.5 mm, Tanimbar Islands, 2008-02; 1♂ NHRS, 34.5 mm, Tanimbar, Sunda Isl, No. 5769 E94.

Remarks: We have not been able to locate the holotype. The lectotype ♂ is herewith designated from syntype and preserved at BMNH (Plate 111 fig. 1).

Diagnose: A relatively large and elongated species, with body approximately 2.9x longer than wide in males, and 2.7x longer than wide in females (Plate 104 figs 2-3, 5-6, 8). Males: length 27.5-42.5 mm, width 9-14.5 mm; females: length 31-42 mm, width 10-15.5 mm. The uniformly orange pronotum, the numerous irregular transversal, yellowish to orange bands on elytra, and abdominal ventrites weakly pubescent in females, easily separates this species from most of the other species of *Nemophas*. This species resembles *N. grayii* (Pascoe, 1859) (especially females) with which it may be confused.

Redescription. Antennae: Scape is coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Uniformly black with very fine brownish pubescence, and a few longer setae. Pronotum: Entirely covered with yellowish to orange pubescence. The lateral pronotal spines are straight and also covered with yellowish to orange pubescence. Elytra: Scattered rounded granulae are visible where the integument is exposed. Mostly at the anterior part of elytra and more numerous towards, and medially on humeri, Elytra have relatively coarse and evenly distributed punctuation, and much finer punctuation on the apical 1/3. The five to six irregular and transversal bands on elytra have orange to yellowish pubescence. In large specimens these transversal bands are more yellowish, slightly interrupted, and orange and solid in small specimens (Plate 104 figs 2-3). The anterior pubescent band is partly covering humeri. Exposed integument is black or with slight blue metallic lustre, and at least as broad as the transversal orange to yellowish bands. Scutellum is covered with very fine punctures and scattered fine, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is narrowly pointed and notched on the middle (Plate 104 fig. 8). Pro-, meso- and mesosternum (except coxae), and the three anterior ventrites (in males medially and in females laterally), are covered with orange pubescence (Plate 104 figs 5, 8). All visible abdominal ventrites in females are oblique and shining medially. Mesosternal process is relatively narrow and raised, and forming an elongated tubercle anteriorly. Legs: Black, with at most very fine whitish pubescence laterally on each femur. Male genitalia. Aedeagus: 4.1-6.2 mm long, relatively narrow, evenly curved towards apex. Dorsal ridge as wide as ventral ridge and both ridges rounded at apex (Figs 9-10). Colour is dark brown. The two yellowish and crescent-shaped sclerites are narrow and folded at the proximal end of the basal phallomer (Plate 118 fig. 5). Median phallomer has a series of yellowish, large punctures on the micro-reticulated membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 1) Basal segment is membranous, tubular, cone-shaped and densely covered with triangular-shaped microspinules Median segment is membranous, short. Terminal segment is strongly elongate, much longer than the apical and median segments combined, well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 2.5 mm. Tegmen: 4.8-6.1 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 41). Parameres: short, broad and flattened dorso-ventrally, weakly separated medially along inner margin and towards apex (Fig. 42). Base of inner margin has a very distinct extension from each paramere projecting forward forming a “tooth” (Fig. 42). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a numerous longer setae, well concentrated at edge of apex. Entire surface of parameres have scattered punctures and fine hairs. Each paramere has laterally a longitudinal impression. Surface is shining due to lack of distinct micro-reticulation on parameres. Tergite VIII: 2.1-3.2 mm long, with brownish pigmentation, posterior margin almost straight or weakly concave, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 73). Surface has medially coarse punctures and very weak micro-reticulation. No difference in male genitalia characters were found between large and small specimens of this species.

Distribution: Indonesia, Southern Moluccas (Maluku), Tanimbar Islands: Yamdena, Maroe (Maru) and Larat Islands. The species is also recorded from Kei (= Kai, Key) Islands (the latter record according to Breuning (1943) and Vitali & Nagirnyi (2009) (Plate 116 fig. 1).

Nemophas (s. str.) ***grayii* (Pascoe, 1859)** (Figs 11-12, 43-44, 74, plate 105 figs 1-2, 4-5, plate 111 fig. 2, plate 112 figs 1-4, plate 117 fig. 2, plate 118 fig. 6)

Monohammus [sic!] *grayii* Pascoe, 1859: 54. Type locality: Ambon Island.

Nemophas grayii (Pascoe, 1859). - Pascoe 1866 (revised), pl. 13, fig. 1; Heller 1919: 103; Aurivillius 1921: 76; Breuning 1943: 279, fig. 152; Breuning 1961: 336; Vitali & Nagirnyi 2009: 472 (original spelling restored).

= *Monochamus doleschali* Redtenbacher, 1867: 181, pl. 5, fig. 4. - Aurivillius 1921: 76; Breuning 1943: 278; Breuning 1961: 336.

= *Nemophas grayi* m. *quinquefasciatus* Breuning, 1943: 279 syn. nov., fig. 153. - Breuning 1961: 336.

Holotype ♂ BMNH: 27 mm, Ambon Isl.

Holotype ♂ *Monochamus doleschali* Redtenbacher, NHMW, Amboin 1857-59.

Additional material: 1♂ CHW, 40.5 mm, Seram Island, 2006-06; 1♂ CHW, 40.5 mm, Seram Island, 2004-12; 1♂ CHW, 34 mm, Seram Island, Moluccas, 2008-03; 1♀ CHW, 35.5 mm, Seram Island, Moluccas, 2008-03; 1♀ CHW, 40 mm, Seram Island, 2006-06; 1♀ CHW, 31.5 mm, Seram Island, 2004-12; 1♀ NHRS, 33.5 mm, Amboin, leg. Staudinger, No. 5766 E94.

Remarks: We regard *Nemophas grayi* m. *quinquefasciata* syn. nov. to be a junior synonym of *N. grayii*. The holotype ♀ of *Nemophas grayi* m. *quinquefasciata* is preserved at FCNMB (Plate 112 fig. 3). The holotype ♂ of *M. doleschali* is preserved at NHMW (Plate 112 fig. 1).

Diagnose: A relatively large and elongated species, with body approximately 3x longer than wide in males, and 2.9x longer than wide in females (plate 102 figs 1-2, 4-5). Males: length 34-40.5 mm, width 11.5-13.5 mm; females: length 32.5-40 mm, width 11.2-14 mm. The pubescence on pronotum is orange anteriorly and black posteriorly, elytra have broad and irregular transversal orange bands, and all abdominal ventrites are black. The colour pattern on elytra easily separates this species from most of the other *Nemophas* species. This species resembles *N. forbesi* (especially females) with which it may be confused. We consider *Nemophas grayi* m. *quinquefasciata* Breuning, 1943 to be only a colour variety of *N. grayii*. Similarly, *Monochamus doleschali* Redtenbacher, 1867 has only three transversal, orange bands on the elytra, and is also a colour variety of *N. grayii* (Plate 112 figs 1-2).

Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Uniformly black, covered with very fine and flattened, black pubescence. Pronotum: Anterior

2/3 of pronotum is covered with dense, orange pubescence. Posterior 1/3 has very fine and black pubescence forming a slightly concave area, reaching the base of lateral spines on pronotum. Elytra: Towards anterior margin the elytra have scattered rounded granulae, visible where the integument is exposed. Granulae are more numerous towards elytra medially and on humeri, with relatively coarse and evenly distributed punctuation. On the apical 1/3 of elytra the punctuation is much finer. Elytra have three to six more or less irregular and broad transversal bands with orange to yellowish pubescence. The anterior pubescent and orange band is almost covering humeri. Exposed integument is black, and mostly more narrow than the transversal orange bands. Scutellum is covered with very fine punctures and scattered fine, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is narrowly pointed and notched on the middle (Plate 105, figs 2, 5). Pro-, meso- and mesosternum (except coxae), mediolaterally and posteriorly, are covered with orange pubescence in males. In females the pubescence is reduced to small patches (Plate 105, fig. 5). Abdominal ventrites is black in both sexes. The lateral pronotal spines are straight. Mesosternal process is relatively narrow and flattened or only slightly raised anteriorly. Legs: Black, at the most with very fine whitish pubescence laterally on each femur. Male genitalia. Aedeagus: 6.5 mm long, and narrowed towards apex, weakly curved towards apex, dorsal ridge as wide as ventral ridge and both ridges rounded at apex (Figs 11-12). Colour is dark brown. The two yellowish and crescent-shaped sclerites are narrow and folded at the proximal end of the basal phallomer (Plate 118 fig. 6). Median phallomer has a series of yellowish large punctures on the micro-reticulated membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 2). Basal segment is membranous, tubular, elongated, cone-shaped and densely covered with small triangular-shaped microspinules. Median segment is membranous, short. Terminal segment is strongly elongate and almost as long as the apical and median segments combined, well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 2.5 mm. Tegmen: 6.0 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 43). Parameres: short and flattened dorso-ventrally, weakly separated medially along inner margin and towards apex (Fig. 44). Base of inner margin has a very distinct extension from each paramere projecting forward forming a "tooth" (Fig. 44). Apex evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a numerous longer setae, well concentrated at edge of apex. Entire surface of parameres have scattered punctures and fine hairs. No micro-reticulation on parameres. Tergite VIII: 3.5 mm long, with brownish pigmentation, posterior margin evenly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 74). Surface medially has coarse punctures and very weak micro-reticulation.

Distribution: Indonesia (Central Moluccas, or Maluku), Seram and Ambon Islands (Plate 116 fig. 1).

Nemophas (s. str.) ***helleri*** **Hauser, 1904** (Figs 13-14, 45-46, 75, plate 105 figs 3, 6-8, plate 109 fig. 8, plate 113 fig. 3, plate 118 fig. 7)

Nemophas helleri Hauser, 1904: 42. Type locality: Kapala-Madang (650-1500 m), Buru Island. - Heller 1919: 103; Aurivillius 1921: 76; Breuning 1943: 281, Fig. 159; Breuning 1961: 337; Vitali & Nagirnyi 2009: 473.

= *Nemophas buruensis* Aurivillius, 1926: 101. - Breuning 1943: 281 (synonymy); Breuning 1961: 337.

Lectotype ♀ MFN: Buru Island, Kapala-Madang, 650-1500 m.

Additional material: 1♂ CUN, 31 mm, Buru Island, 1996-07; 1♀ CUN, 35 mm, Buru Island, 1996-07; 1♂ CHW, 33 mm, Buru Island, 2004-12; 1♂ CHW, 33.5 mm, Buru Island, 2007-06; 1♀ CHW, 35.5 mm, Buru Island, 2004-12; 1♀ NHRS, 37 mm, Buru Island, Mount Mada 3000', 1898-09, leg. Dumas, No. 5772 E94.

Lectotype ♀ *N. buruensis*, NHRS: 46 mm, Buru Island, Station 9, 26.04-1.06. 1921, leg. L.J. Toxopeus (from the type series of *N. buruensis* Aurivillius, 1926), No. 5773 E94.

Paralectotypes: 1♂ NHRS, 26 mm, Buru Island, Station 7 alt, 1921-09, leg. L.J. Toxopeus (from the type series of *N. buruensis*), No. 5774 E94; 1♂ NHRS, 37.5 mm, Buru Island, Station 18 alt, 1921-11-02/03, leg. L.J. Toxopeus (from the type series of *N. buruensis*), No. 5771 E91.

Remarks: A lectotype ♀ of *N. helleri*, corresponding to the original description has been designated. The labelling data on the lectotype is identical with the data in the original description (Hauser 1904): Kapala-Madang, 650-1500 m (Plate 112, fig. 5) and preserved at MFN. A lectotype ♀ (46 mm) has also been designated from the type series of *N. buruensis* (Plate 109 fig. 8) with the following labelling data; "Type, *buruensis* Auriv.", Buru Island, Station 9, 26.04-1.06. 1921, leg. L.J. Toxopeus, No. 5773 E94, preserved at NHRS.

Diagnose: A medium-sized to relatively large and elongated, subcylindrical species, with body approximately 3x longer than wide in males, and 3.2x longer than wide in females (Plate 105 figs 3, 6-8). Males: length 31-37.5 mm, width 12-12.5 mm; females: length 35-46 mm, width 12.5-14.5 mm. The yellow pronotum, smooth humeri, narrow and irregular transversal yellow bands on elytra, yellow small spots on metasternum, and first visible ventrite, easily separates this species from all other species of *Nemophas*.

Redescription. Antennae: Scapes are finely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males have blue metallic lustre and are very long, longer than body with a little more than six antennomeres, and in females relatively long, longer than body with about four antennomeres. Head: Uniformly black, covered with very short and fine, flattened, black pubescence. Pronotum: Covered with yellowish pubescence apart from the apex of lateral pronotal spines and a small black (glabrous) spot medially on pronotum. The lateral pronotal spines are straight. Elytra: Anterior part of elytra and humeri are glabrous and smooth, i.e. without any trace of granulae or yellowish pubescence, and supplied with very fine punctuation medially on elytra. Entire elytral surface and antennae are shining with a blue or green metallic lustre, with a very fine pattern of small meshes of unequal shape. Elytra have four to five yellow interrupted and oblique transversal and narrow bands, mostly forming rectangular spots. Scutellum is black, covered with very fine punctures and scattered fine, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is relatively narrowly pointed and weakly notched on the middle (Plate 105, figs 3, 6). Mesosternum and posterior part of metasternum have yellow pubescence. The yellow pubescence on first visible abdominal ventrite is reduced to two small rounded spots. The remaining ventrites are black (Plate 105 figs 6, 8). Mesosternal process is relatively narrow and flattened. Scapes have scattered, coarse punctures. Legs: Black, with at most very fine whitish pubescence laterally on each femur. Male genitalia. Aedeagus: 5.1 mm long, narrowed and weakly curved towards apex. Dorsal ridge as wide as ventral ridge r and both ridges are rounded at apex (Figs 13-14). Colour is yellow to brown. The two yellowish and crescent-shaped sclerites are narrow and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 7). Median phallomer has a series of yellowish, small punctures on the micro-reticulated membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 11). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 3). Basal segment is membranous, tubular, elongated, cone-shaped and densely covered with small triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongated (much longer than the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 1.9 mm. Tegmen: 6.0 mm long, base of tegmen extended and strongly curved dorso-ventrally on middle (Fig. 45). Parameres: short and flattened dorso-ventrally, weakly separated medially along inner margin and towards apex (Fig. 46). Base of inner margin has a very distinct extension from each paramere projecting forward forming a "tooth" (Fig. 46). Apex evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a numerous longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. No micro-reticulation on parameres. Tergite VIII: 2.9 mm long, with brownish pigmentation, posterior margin almost straight, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 75). Surface medially has coarse punctures and very weak micro-reticulation.

Distribution: Indonesia (Central Moluccas), Buru Island (Plate 116 fig. 1).

Nemophas (s. str.) ***rosenbergii*** **Ritsema, 1881**
(Figs 15-16, 47-48, 76, plate 106 figs 1-2, 4-5, plate 113 fig. 1, plate 115 fig. 4, plate 117 fig. 4, plate 118 fig. 8)

Nemophas rosenbergii Ritsema, 1881: 148. Type locality: Toelabollo, Sulawesi Island. - Heller 1919: 102; Aurivillius 1921: 77; Breuning 1943: 280, fig. 157; Breuning 1961: 336; Vitali & Nagirnyi 2009: 471, 472, figs 4-5 (original spelling restored).

Holotype ♂ ZMA: 42 mm, Central Sulawesi, Toelabollo. Additional material: 1♀ CUN, 28 mm, Celebes Isl. (Sulawesi), 1992; 1♂ CHW, 32.5 mm, Celebes Island (Sulawesi), Palolo Palu, 2005-06; 1♀ CHW, 42.5 mm, Celebes Island (Sulawesi), Palolo Palu, 2005-10; 1♂ CHW, 39 mm, Celebes Island (Sulawesi), Palolo Palu, 2007-06; 1♀ CHW, 38.5 mm, Celebes Island (Sulawesi), Palolo Palu, 2007-06.

Diagnose: A relatively large and elongated species, with body approximately 3x longer than wide in males, and 2.9x longer than wide in females (Plate 106 figs 1-2, 4-5). Males: length 32.5-39 mm, width 11-13 mm; females: length 28-42.5 mm, width 11.5-14.5 mm. The ochreous pubescence on head and frons, combined with the ochreous transversal bands on elytra and the ochreous pubescence covering the ventral part of the body, easily separates this species from most of the other species of *Nemophas*. The colour patterns on pronotum and elytra resemble, to some extent, those of *N. bicinctus* Lansberge van, 1880 and *N. tricolor* Heller, 1896.

Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six to seven antennomeres, and in females relatively long, longer than body with about four antennomeres. Head: Mostly uniformly covered (including frons) with fine ochreous pubescence (Plate 115 fig. 4). The ochreous pubescence on head was noticed to be reduced to frons and genae in two (slightly worn) specimens. Pronotum: Anterior 2/3 covered with dense ochreous pubescence, with about 16 longer, black setae along the posterior margin of the ochreous area. Posterior 1/5 of pronotum has a mixture of very fine black and ochreous pubescence forming a slightly concave area reaching the base of lateral spines on pronotum. Basal part of lateral pronotal spines has e few long black setae. The lateral pronotal spines are straight. Elytra: Apically with scattered rounded granulae and numerous granulae on humeri. The punctuation is very coarse between the ochreous transversal bands on apical 1/4 of elytra, medially with slightly less coarse punctures and on posterior 1/3 with very fine punctuation. Elytra are shining with a weak, black or green metallic lustre where the integument is exposed. Anterior part of elytra (between scutellum and humeri) often has ochreous to brownish pubescence, and the remaining part of elytra has two distinct ochreous bands and an irregular band, mostly reduced to a few rounded spots towards apices. The areas between the ochreous bands are about as broad as the adjacent yellow band. Scutellum is completely covered with fine and dense, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is slightly pointed and notched on the middle (Plate 106 fig. 5). Pro-, meso- and mesosternum (except coxae), and all visible abdominal ventrites, covered with very dense, ochreous pubescence (plate 106 figs 4-5). Mesosternal process is relatively narrow and with a small tubercle anteriorly. Legs: Black, with fine yellowish pubescence laterally on each femur. Male genitalia. Aedeagus: 6.0 mm long and strongly raised posteriorly, weakly curved towards apex, dorsal ridge as wide as ventral ridge at apex (Figs 15-16). Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are narrow and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 8). Median phallomer has a series of yellowish, large punctures laterally on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 11). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 4). Basal segment is membranous, tubular, strongly elongated and densely covered with small triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongate (as long as the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 2.1 mm. Tegmen: 6.0 mm long, base of tegmen extended and strongly curved dorso-ventrally on middle (Fig. 47). Parameres: short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 48). Base of inner margin has a very distinct extension from each paramere, projecting forward forming a tooth-like plate (Fig. 48). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. Surface has no micro-reticulation on parameres. Tergite VIII: 3.5 mm long, with brownish pigmentation, posterior margin broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 76). Surface medially has no coarse punctures or microreticulation.

Distribution: Indonesia, Central Sulawesi (e.g. Toelabollo, Palolo Palu) (Plate 116 fig. 1).

Nemophas (s. str.) ***tricolor*** **Heller, 1896** (Figs 17-18, 49-50, 77, plate 106 figs 3, 6-8, plate 112 figs 6-7, plate 115 fig. 5, plate 117 fig. 5, plate 118 fig. 9)

Nemophas tricolor Heller, 1896: 23, fig. 13. Type locality: Luhu (Luwu), Central Sulawesi Island. - Heller 1919: 103; Aurivillius 1921: 77; Breuning 1943:

280; Breuning, 1961: 336; Vitali & Nagirnyi 2009: 472.

Lectotype ♂ FCNMB: 29 mm, Kalaena River, altitude 500m, Leg. Drs. Sarasin, *Nemophas tricolor* Det. K. M. Heller.
Additional material: 1♂ CUN, 37 mm, S. Sulawesi, Mt. Lompobatang; 1♂ CHW, 18 mm, Sulawesi, Puncak, Palopo, 2001-06; 1♂ CHW, 36 mm, South Sulawesi, Banteng, 2006-04; 1♂ CHW, 39.5 mm, South Sulawesi, Palolo Palu, 2008-04; 1♀ CHW, 40.5 mm, South Sulawesi, Palolo Palu, 2008-04; 1♂ CHW, 28 mm, Sulawesi, 2004-09.

Remarks: A lectotype ♂ has been designated with the following collection data: Luwu, Kalaena River, altitude 500 m, Leg. Drs. Sarasin, *Nemophas tricolor* Det. K. M. Heller, preserved at FCNMB (Plate 112 figs 6-7). The diagnosis and the collection data on the pinned labels match the information given in the original description, and Heller wrote that he only included one specimen, so it is likely that this is the original type. Type locality: Indonesia, Central Celebes (= Sulawesi), Luhu (= Luwu).
Diagnose: A relatively large and elongated species, with body approximately 2.9x longer than wide in males, and 3.1x longer than wide in females (Plate 106 figs 3, 6-8). Males: length 18-39.5 mm, width 8.5-13.5 mm; females: length 31-40.5 mm, width 10-13 mm. The dull red pubescence on frons not reaching antennal tubercle, combined with the ochreous to yellowish, transversal bands on elytra easily separates this species from most of the other species of *Nemophas*. The colour pattern on elytra resembles, to some extent, those of *N. bicinctus* and *N. rosenbergii*.
Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are very long, longer than body with about six to seven antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Black dorsally and laterally. Frons is covered with fine, dull and red pubescence that forms a distinct rectangular patch, not extending antennal tubercles (Plate 115 fig. 5). Pronotum: Anterior 2/3 covered with dense ochreous to yellowish pubescence, with about 20 longer, black setae along the posterior margin of the ochreous area. Posterior 1/5 has very fine, black pubescence, forming a slightly concave area reaching the base of lateral spines on pronotum. Basal part of lateral pronotal spines with a few long black setae. The lateral pronotal spines are straight. Elytra: Apical part of elytra supplied with scattered rounded granulae and numerous granulae on humeri. Punctuation is very coarse between the ochreous to yellowish transversal bands on apical 1/4 of elytra. Elytral punctuation is slightly less coarse medially and very fine punctuation on posterior 1/3. Elytra are shining with a weak black or blue, metallic lustre where the integument is exposed. Anterior part of elytra (between scutellum and humeri) often have red pubescence. The remaining part of elytra has two distinct ochreous to yellowish transversal bands and an irregular band mostly reduced to a few rounded and red spots towards apices. The areas between the ochreous to yellowish bands are about as broad as the adjacent yellow band. Scutellum is completely covered with short, fine and dense, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is slightly pointed and notched on the middle (Plate 106 figs 3, 6). Pro-, meso- and mesosternum (except coxae), and all visible abdominal ventrites, are covered with very dense, ochreous to yellowish pubescence (Plate 106 figs 3, 6-8). Lateral part of the area between pro- and mesosternum is red. Mesosternal process is relatively narrow and slightly raised anteriorly. Legs: Black, with fine whitish or yellowish pubescence laterally on each femur. Male genitalia. Aedeagus: 5.5 mm long, acutely curved towards apex. Dorsal ridge is flattened medially, and as wide as ventral ridge and dorsal ridge at apex (Figs 17-18). Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are relatively narrow, and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 9). Median phallomer has a series of yellowish, large punctures laterally on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 5). Basal segment is membranous, tubular, strongly elongated and densely covered with small triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongate (as long as the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 3.0 mm. Tegmen: 5.1 mm long, base of tegmen is extended and acutely curved dorso-ventrally on middle (Fig. 49). Parameres: Short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 50). Base of inner margin has a very distinct extension from each paramere, projecting forward forming a tooth-like plate (Fig. 50).

Apex evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. Surface has no micro-reticulation on parameres. Tergite VIII: 3.0 mm long, with brownish pigmentation, posterior margin straight or weakly concave, broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 77). Surface medially has coarse punctures and numerous setae and weak micro-reticulation.
Distribution: Indonesia, Sulawesi (e.g. Banteng, Palolo Palu) (Plate 116 fig. 1).

Nemophas **(s. str.)** ***trifasciatus*** **Heller, 1919** (Figs 19-20, 51-52, 78, plate 107 figs 1, 4, 7-8, plate 112 figs 8-9, plate 117 fig. 6, plate 118 fig. 10)
Nemophas trifasciatus Heller, 1919: 101. Type locality: Kei (= Kai, Key) Islands. - Heller 1919: 103; Aurivillius 1921: 77; Breuning 1943: 279; Breuning 1961: 336; Vitali & Nagirnyi 2009: 472.

Lectotype ♀ FSSD: 41 mm, Key Insel, 1918.
Additional material: 1♀ FSSD, 41 mm, Kei Islands, 1918, leg. Staudinger & Bang Haas; 1♂ CUN, 33 mm, Kei Islands, 2009-02; 1♀ CUN, 34 mm, Kei Islands, 2009-02; 1♂ CHW, 38 mm, Kei Islands, 2008-08; 1♀ CHW, 40 mm, Kei Islands, 2008-08.

Remarks: A lectotype ♀ (Plate 112 figs 8-9), corresponding to the original description of a single female specimen, has been designated with following labelling data: Key Insel, 1918. The specimen is preserved at FSSD.
Diagnose: A relatively large and broad species, with body approximately 2.8x longer than wide in males, and 2.6x longer than wide in females (Plate 107 figs 1, 4, 7-8). Male: length 33-38 mm, width 12-13 mm; female: length 34-41 mm, width 13-15 mm. The black frons, combined with the grey transversal bands on elytra, easily separates this species from most of the other species of *Nemophas*.
Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Uniformly black and covered with extremely fine and flattened, whitish pubescence, entirely exposing the integument. Pronotum: Pronotum is predominantly black, densely covered with a mixture of very fine and flattened black and grey pubescence, especially medially and towards posterior margin. Basal part of lateral pronotal spines has a few long black setae. The lateral pronotal spines are straight. Elytra: Apically with numerous rounded granulae and numerous and slightly larger granulae on humeri. Very coarse punctuation between the grey transversal bands on apical 1/4 of elytra, medially with slightly less coarse punctures and on posterior 1/3 with very fine punctuation. Elytra shining where the integument is exposed. Integument is black. Anterior part of elytra (between scutellum and humeri) has sparse grey pubescence. The remaining part of elytra has three irregular grey transversal bands and an oblique band mostly reduced to a few rounded and grey spots towards apices. Anterior part of elytra (between scutellum and humeri) is mostly glabrous and without distinct punctures, only scattered and large, rounded granulae with the distance between granulae much greater than the width of the granulae. The areas between the grey bands on elytra where the integument is exposed, are about as broad as the adjacent grey band. Scutellum is completely covered with short, fine and dense, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is weakly pointed and slightly notched on the middle, and last sternite is covered with brown pubescence and numerous long setae. Pro-, meso- and metasternum (except coxae), are weakly covered with grey pubescence (Plate 107 figs 4, 8). Posterior margin of abdominal ventrites have grey pubescence. Mesosternal process is relatively narrow and slightly raised anteriorly. Legs: Black, with fine whitish or yellowish pubescence laterally on each femur. Male genitalia. Aedeagus: 6.0 mm long, and acutely curved towards apex. Dorsal ridge is narrowly raised medially, but as wide as ventral ridge and dorsal ridge at apex (Figs 19-20). Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are relatively broad and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 10). Median phallomer has a series of yellowish, large punctures laterally on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 6). Basal segment is membranous, tubular, conical and densely covered with large triangular-shaped microspinules. Median segment is membranous, short. Terminal segment is strongly elongate (much longer than apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is

approximately 2.0 mm. Tegmen: 5.8 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 51). Parameres: Relatively short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 52). Base of inner margin has a very distinct extension from each paramere, projecting forward forming a tooth-like plate (Fig. 52). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. Surface has no micro-reticulation on parameres. Tergite VIII: 3.0 mm long, with brownish pigmentation, posterior margin broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 78). Surface medially with scattered and coarse punctures, and with weak micro-reticulation.

Distribution: Indonesia, Kei Islands (Plate 116 fig. 1).

Nemophas (s. str.) ***websteri* Jordan, 1898** (Figs 21-22, 53-54, 79, plate 107 figs 2, 5, 9, plate 113 figs 2-5, plate 115 fig. 6, plate 117 fig. 7, plate 118 figs 11-12)

Nemophas websteri Jordan, 1898: 419. Type locality: New Hanover Island. - Aurivillius 1921: 77; Breuning 1943: 279, fig. 156; Breuning 1961: 336; Vitali & Nagirnyi 2009: 472.

Lectotype ♂ MNHN: 24.2 mm, Neu Hannover, 1897-03-02, leg. H. C. Webster, ex. Coll. W. Rothschild.

Additional material: 1♂ IRSNB, 38.5 mm, Neu Mecklenburg (New Ireland Province), labelled "G. M."; 1♂ BMNH, 31 mm (examined by photo), New Hanover (Bismarck Archipelago), 1934-11-15, leg. J. L. Froggatt; 1♂ & 5♀ FCNMB, Neu Mecklenburg (New Ireland) (examined by photo); 1♂ (Fig. 45) & 2♀ MNHN, Neu Hannover, 1897-03-02, leg. H. C. Webster, ex. Coll. W. Rothschild.

Remarks: A lectotype ♂ from the type series preserved at MNHN has been designated with the following labelling data: Neu Hannover 1897-03-02, leg. H. C. Webster (ex. coll. W. Rothschild). The species is, to our knowledge, not collected after 1934; most specimens were collected 1897 or earlier. The old museum collections contain a total of 16 specimens of this species: 1♀ is preserved at FSSF, 1♂ at IRSNB, 1♂ at BMNH, 4 specimens (2♂ & 2♀) at MNHN, 6 specimens (1♂ & 5♀) at FCNMB, and 3 specimens (1♀ & 2♂) at MFN.

Diagnose: A relatively large and broad species, with body approximately 2.9x longer than wide in both sexes (Plate 107 figs 2, 5, 9). Males: length 24-28.5 mm, width 8.5-9.5 mm. The beautifully orange to bright orange body, only covered with narrow to relatively narrow, black, transversal bands on the elytra, the lateral pronotal spines that are strongly curved upward towards apex, and the coarsely punctured scapes, easily separates this species from all other species of *Nemophas*.

Redescription. Antennae: Scapes are dull and densely covered with very coarse and deep punctures (apart from the fine reticulation), medially the distance between punctures is mostly less than the width of one puncture, and distally confluent (Plate 119 fig. 13). Antennae in males are long, longer than body with about six to seven antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: Uniformly covered with orange or bright orange pubescence (Plate 115 fig. 6). Pronotum: Entirely covered with brown to bright orange pubescence, apart from a median black spot on pronotum (which is larger in females than in males) and dorsally on lateral pronotal spines. Basal part of lateral pronotal spines has a few long black setae. The lateral pronotal spines are strongly curved upward towards apex, which is a character this species only share with *N. bennigseni*. Elytra: Apical part of elytra is supplied with numerous rounded granulae and numerous and slightly larger granulae on humeri (partly seen on expose integument). Very coarse punctuation on apical 1/4 of elytra, medially with slightly less coarse punctures and on posterior 1/3 with very fine punctuation. Elytra are black and shining where the integument is exposed. Anterior part of elytra (between scutellum and humeri) is almost covered with brown to bright orange pubescence, apart from a narrow median area where the integument is exposed. The remaining part of elytra has brown to bright orange pubescence interrupted by four black and narrow and transversal bands where the integument is exposed. The black transversal bands on elytra are mostly more narrow than the adjacent brown to bright orange band. Scutellum is completely covered with short, fine and dense, brown to bright orange pubescence. Ventral part of the body: Last abdominal ventrite in female is pointed and slightly notched on the middle. Pro-, meso- and metasternum (except coxae), and all visible abdominal ventrites are densely covered with brown to bright orange (Plate 107 fig. 5). Mesosternal process is relatively broad, flat and covered with orange pubescence. Legs: Black, with fine whitish or yellowish pubescence laterally on femora. Male

genitalia. Aedeagus: 5.0 mm long and weakly curved towards apex. Dorsal ridge is narrowly raised medially, but as wide as ventral ridge and dorsal ridge at apex (Figs 21-22). Colour is yellowish. The two yellowish and crescent-shaped sclerites are relatively broad and weakly folded at the proximal end of the basal phallomer (Plate 118 fig. 11). Each sclerite is attached to an elongated spiral-like structure not seen in any other species of *Nemophas*. These sclerites at the proximal end of the basal phallomer resemble only those found in *Iothocera tomentosa* (Plate 119 fig. 2). Median phallomer has a series of yellowish, large punctures laterally on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 7). Basal segment is membranous, strongly elongated, and densely covered with small triangular-shaped microspinules. Median segment is membranous and short. Terminal segment is strongly elongate and relatively broad (almost as long as the apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 1.9 mm. Tegmen: 5.0 mm long, base of tegmen extended and acutely curved dorso-ventrally on middle (Fig. 53). Parameres: Relatively short and flattened dorso-ventrally, separated medially along inner margin and towards apex (Fig. 54). Base of inner margin has a very distinct extension from each paramere projecting forward forming a tooth-like structure (Fig. 54). Apex evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Entire surface of parameres has scattered punctures and fine hairs. Surface is shining, with no micro-reticulation on parameres. Tergite VIII: 2.2 mm long, with brownish pigmentation, posterior margin rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 79). Surface medially with scattered and coarse punctures, and with distinct micro-reticulation.
Distribution: Papua New Guinea (Island provinces), the islands of New Hanover and New Ireland (Bismarck Archipelago) (Plate 116 fig. 1).

Nemophas **(s. str.)** ***zonatus*** **Lansberge van, 1880** (Figs 23-24, 55-56, 80, plate 107 figs 3, 6, plate 108 figs 1, 4, plate 114 figs 1-2, plate 115 fig. 7, plate 117 fig. 8, plate 118 fig. 13)
Nemophas zonatus Lansberge van, 1880: 137. Type locality: Timor Island. - Heller 1919: 102; Aurivillius 1921: 77; Breuning 1943: 279, fig. 154; Breuning 1961: 336; Vitali & Nagirnyi 2009: 473.

Holotype ♀ MNHN: 36.8 mm, Timor Island.
Additional material: 1♂ CHW, 37.5 mm, Flores Island, 2005-01; 1♂ CHW, 41.5 mm, Flores Island, 2005-07; 1♀ CHW, 38 mm, Flores Island, 2005-01; 1♀ CHW, 36 mm, Flores Island, 2005-07; 1♂ CUN, 42.5 mm, Buru Island, 2002-03; 1♀ CUN, 42 mm, Buru Island, 2002-03; 1♀ CUN, 42 mm, Flores Island, 2001-07; 1♂ NHRS, 39 mm, Alor Island, No. 5767 E94.

Diagnose: A relatively large and broad species, with body approximately 2.9x longer than wide in males, and 3x longer than wide in females (plate 107 figs 3, 6, plate 108 figs 1, 4). Males: length 37.5-42.5 mm, width 13.5-14.5 mm; females: length 36-42 mm, width 12-14 mm. The weak yellow pubescence on frons, the yellow ventral part of the body, and the regular and numerous yellow bands on elytra, separates this species from most of the other species of *Nemophas*. This species may be confused (viewed dorsally) with *N. grayii*. However, normally the yellowish colour of *N. zonatus*, both dorsally and ventrally, is easily distinguished from the other species of *Nemophas*.
Redescription. Antennae: Scapes are coarsely reticulated, with scattered, fine and shallow punctures (as in plate 119 fig. 11). Antennae in males are long, longer than body with about six antennomeres, and in females relatively long, longer than body with about three to four antennomeres. Head: The lower part of frons has fine yellow pubescence (Plate 115 fig. 7). Remaining part of head is black with no, or only scattered, very fine brown pubescence. Pronotum: Anterior 2/3 of pronotum covered with dense yellow pubescence, with about 15 longer, black setae along the posterior margin of the yellow area. Posterior 1/5 of pronotum is black, with no or very weak and fine brown pubescence medially. The black and slightly concave area reaches the base of lateral spines on pronotum. Basal part of lateral pronotal spines has a few long black setae. The lateral pronotal spines are straight. Elytra: Apical part is almost smooth, only supplied with a few weak and rounded granulae on humeri. The punctuation is coarse between the yellow transversal bands on apical 1/4 of elytra. The punctuation is slightly less coarse medially and on the posterior 1/3 the punctuation is very fine. Elytra are shining where the integument is exposed. Integument is black. Anterior part of elytra between scutellum and humeri has sparse yellow pubescence. The remaining part of elytra has three

regular yellow transversal bands, and also a solid band towards apices. The areas between the yellow bands on elytra (where the integument is exposed) are about as broad as the adjacent grey band. Scutellum is completely covered with short, fine and dense, dark brown pubescence. Ventral part of the body: Last abdominal ventrite in female is weakly pointed and notched on the middle, and last sternite is covered with brown pubescence and numerous long setae (Plate 108, fig. 4). Pro-,meso- and metasternum (except coxae) are densely covered with yellow pubescence (plate 107 fig. 6, plate 108 fig. 4). Mesosternal process is relatively narrow and slightly raised anteriorly, with yellow pubescence laterally. Male genitalia. Aedeagus: 6.2 mm long, strongly curved towards apex. Dorsal ridge is narrowly raised medially, but as wide as ventral ridge and dorsal ridge at apex (Figs 23-24). Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are relatively broad and completely folded at the proximal end of the basal phallomer (Plate 118 fig. 13). Median phallomer has a series of yellowish, large punctures laterally on the smooth membrane, projecting inward as needle-shaped structures along the lateral margin (as in plate 119 fig. 5). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 8). Basal segment is membranous, tubular, conical and densely covered with small triangular-shaped microspinules. Median segment is membranous, short. Terminal segment is strongly elongate (as long as apical and median segments combined), well sclerotized and narrow. The total length of basal, median and terminal segments is approximately 2.5 mm. Tegmen: 6.0 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 55). Parameres: Short and flattened dorso-ventrally, projecting inwards along inner margin and towards apex (Fig. 56). Base of inner margin has a very distinct extension from each paramere, projecting forward forming a tooth-like plate (Fig. 56). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Surface of parameres has scattered punctures and fine hairs. Posterior surface of parameres is shining with no micro-reticulation. The colour is dark brown. Tergite VIII: 3.2 mm long, with brownish pigmentation, posterior margin is broadly rounded, and covered with short, coarse brownish hairs distally towards the posterior margin (Fig. 80). Surface medially has scattered and coarse punctures, with weak micro-reticulation.

Distribution: Indonesia, the islands of Timor, Flores, Alor (according to Breuning 1944) and Buru (Plate 116 fig. 1). This appears to be the most widespread species with a new record from Buru Island.

***Nemophas* subgenus *Pilomophas* subgen. nov.**

Type species: *Nemophas* (*Pilomophas*) *ramosi* Schulze, 1920.

Derivatio nominis: The name *Pilomophas* is a combination of parts of the Latin word "pilosus" (hairy) and the genus name *Nemophas*.

Description: Differs from *Nemophas* (*Nemophas*) by the following characters: Pronotum is smooth without a raised posteromedial callus. Antennae (at least scapes, and the following four antennomeres) are covered with ocherous pubescence (Plate 108 figs 2, 7). Lower eye lobe (below scape) is large and only slightly elongated, almost twice as long as gena below (Plate 115 fig. 8). Last abdominal segment in females is more or less pointed (Plate 108 fig. 5). Last antennomere in males is more than twice the length of the penultimate, and antennae are very long, longer than body with about six to seven antennomeres. The lateral pronotal spines are short, blunt and slightly curved upward towards apex. Mesosternal process is relatively narrow and slightly raised anteriorly. Pro-, meso- and metasternum (except coxae), and all visible abdominal ventrites, are covered with very dense, ochreous pubescence. Terminal segment inside the internal sac is well sclerotized, large and deeply notched on the middle of the broadly rounded posterior margin. It is as long as apical and median segments combined (Plate 117 fig. 9).

***Nemophas (Pilomophas) ramosi* Schulze, 1920 comb. nov.** (Figs 25-26, 57-58, 81, plate 108 figs 2, 5, 7-8, plate 113 figs 6-7, plate 114 figs 3-4, plate 115 fig. 8, plate 116 fig. 2, plate 117 fig. 9, plate 118 fig. 14, plate 119 fig. 6)

Nemophas rosenbergii ramosi Schulze, 1920: 193, pl. 2, fig. 2. Type locality: Mt. Ramos, Surigao, Mindanao Island. - Heller 1924: 165.

Nemophas ramosi Schulze, 1920. - Vitali & Nagirnyi 2009: 471-472, figs 1, 6-7 (revised; placed as valid species).

= *Nemophas rosenbergi* var. *ramosi* Schulze, 1920. - Aurivillius 1921: 607.

= *Nemophas subterrubens* Heller, 1924: 164-165 syn. nov. - Vitali & Nagirnyi 2009: 472.

= *Nemophas subterrubus* Heller, 1924. - Breuning 1961: 336 (misspelling).

= *Nemophas subcylindricus* var. *virescens* Aurivillius, 1927. - Breuning 1944: 281 (nec Aurivillius); Breuning 1961: 337 (nec Aurivillius).

Neotype ♂ CHW: 28 mm, Mindanao Island, 2008-07.
Additional material: 1♂ CUN, 31 mm, Mindanao, 2000-07-24; 1♀ CHW, 37.5 mm, Mindanao Island, 2008-07; 1♀ CHW, 37 mm, South of Mindanao Island, 2009-07-20; 1♂ CHW, 30 mm, Mindanao Island, 2008-07; 1♂ CHW, 28.5 mm, Mindanao Island, 2008-07; 1♀ CHW, 35 mm, South of Mindanao Island, 2009-04-06; 1♂ CHW, 28 mm, South of Mindanao Island, 2010-07-20/25.
Lectotype of *N. subterrubens* ♂ USNM, Samar Island, Baker (designated from the type series of *N. subterrubens*).
Paralectotype of *N. subterrubens* ♀ (designated from the type series) FSSD, Samar Island, Baker.

Remarks: Vitali & Nagirnyi (2009) resurrected *N. ramosi* as a genuine species, with *N. subterrubens* as a separate species, or a possible subspecies, of *N. ramosi*. However, we regard *N. subterrubens* only as a colour variety of *N. (Pilomophas) ramosi* comb. nov. and we consider *N. subterrubens* as a junior synonym of *N. (Pilomophas) ramosi*. The type, as part of the Schultze collection is lost (cf. Lingafelter & Hoebeke 2001). A neotype (♂) of *Nemophas (Pilomophas) ramosi* Schulze comb. nov. has been designated from the same island as the type locality, carrying the following labelling data: The Philippines, Mindanao Island, 2008-07 (local collector). The neotype is deposited at NHRS. A lectotype ♂ of *N. subterrubens* Heller, corresponding to the original description is designated, carrying the following collection data: Island Samar, Baker, No. 22545). It is preserved at USNM (Plate 113 figs 6-7). A paralectotype ♀ of *N. subterrubens* designated from a syntype, is preserved at FSSD (Plate 114 figs 3-4).
Diagnose: A medium-sized to large and distinctly elongated species (subcylindrical in both sexes), with body 3-3.3x longer than wide in both sexes (Plate 108 figs 2, 5, 7-8). Males: length 28-31 mm, width 9-9.5 mm; females: length 34-37.5 mm, width 11-12.5 mm. The blunt and slightly curved pronotal lateral spines, the dense ochreous pubescence on antennae, combined with the difference in the ochreous transversal bands (one narrow and one broad) on elytra are unique characters for this species. The general colour pattern on pronotum, elytra and abdominal ventrites, resembles to some extent, those of *N. rosenbergii*. The latter species lack the pubescent antennae and legs.
Redescription. Antennae: Scapes, and the following four antennomeres, are densely covered with fine ochreous pubescence (plate 108 figs 2, 5, 7-8). Antennae in males are very long, longer than body with about six to seven antennomeres, and in females relatively long, longer than body with about four antennomeres. Last antennomere in males is more than twice as long as penultimate. Head: Frons and head are uniformly covered with fine ochreous pubescence (Plate 115 fig. 8). Eyes: Lower eye lobe (below scape) is relatively large and rounded, almost twice as long as gena below. Pronotum: Covered with dense ochreous pubescence and with a small rounded spot medially, where the integument is exposed.), Pronotum has about 10-16 longer, black setae along the posterior margin. Basal part of lateral pronotal spines has a few long black setae. The lateral pronotal spines are short, blunt and only slightly curved upward towards apex. Elytra: Apical part of elytra is supplied with scattered, rounded granulae and numerous granulae on humeri, especially towards and on epipleuron. The punctuation is relatively coarse between the ochreous transversal bands on apical 1/4 of elytra. Medially the punctures are slightly less coarse punctures and posterior 1/3 part has very fine punctuation. Elytra is shining with a weak blue or green metallic lustre, where the integument is exposed. Anterior part of elytra has ochreous to brownish pubescence between scutellum and humeri. The remaining part of elytra has two distinct ochreous bands and a narrow ochreous band towards apices. Scutellum is completely covered with fine and dense, ochreous to brown pubescence. Ventral part of the body: Last abdominal ventrite in female is weakly pointed and posterior margin is straight (Plate 108 fig. 5). Pro-, meso- and mesosternum (except coxae), and all visible abdominal ventrites, are covered with very dense, ochreous pubescence (Plate 108 figs 5, 8). Legs: Entirely covered with fine and dense ochreous or brownish pubescence. Male genitalia. Aedeagus: 5.0 mm long and relatively broad, weakly curved anteriorly and straight towards apex. Dorsal ridge is as wide as ventral ridge at apex (Figs 25-26). Colour is yellowish to brown. The two yellowish and crescent-shaped sclerites are narrow, very long, weakly curved and attached to a fish-bone-like sclerotized pattern at the proximal end of the basal phallomer (Plate 118 fig. 14). This character resembles that found inside the basal segment of *Pseudonemophas baluanus*. Median phallomer is weakly supplied with a series of yellowish punctures laterally on the smooth membrane, projecting inward as small needle-shaped structures along the lateral margin (Plate 119 fig. 6). Internal sac has basal, median and terminal segments exposed (Plate 117 fig. 9). Basal segment is membranous, tubular, almost rectangular and densely covered with small

triangular-shaped microspinules. Median segment is membranous, broad and short Terminal segment is strongly elongated, large and deeply notched on the middle of the broadly rounded posterior margin. The terminal segment is well sclerotized, and almost as long as the apical and median segments combined. Total length of basal, median and terminal segments is approximately 2.0 mm. Tegmen: 5.5 mm long, base of tegmen is extended and strongly curved dorso-ventrally on middle (Fig. 57). Parameres: Very short and flattened dorso-ventrally, well separated medially along inner margin and towards apex (Fig. 58). Base of inner margin has a very distinct, and very wide, extension from each paramere, projecting forward forming a plate from the base of parameres. The sides are concave and apical margin is slightly projecting forward (not tooth-like) (Fig. 58). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, yellowish to brownish hairs and a few slightly longer setae, well concentrated at edge of apex. Entire surface of parameres have scattered punctures and fine hairs. Surface is densely covered with short setae, but with no micro-reticulation on parameres. Tergite VIII: 2.9 mm long, broad at base and strongly narrowing towards the posterior margin, with yellowish pigmentation medially and brownish pigmentation towards posterior margin. The posterior margin is broadly rounded, and covered with short, coarse brownish hairs and distally towards the posterior margin (Fig. 81). Surface medially has coarse punctures, but with weak micro-reticulation.

Distribution: The Philippines, the islands of Mindanao and Samar (Plate 116 fig. 1).

Genus *Nemoplophora* gen. nov.

Type species: *Nemoplophora subcylindricus* (Aurivillius, 1927).

Derivatio nominis: The name *Nemoplophora* is a combination of parts of the words *Nemophas* and *Anoplophora*.

Description: Pronotum is smooth with apical 2/3 covered with whitish to yellowish pubescence (Plate 108 figs 3, 6, plate 109 figs 1, 4, plate 114 fig. 5). Antennae are without any trace of pubescent annulations. Scapes have micro-reticulation with numerous large and deep punctures, and with a green or blue metallic lustre (Plate 119 fig. 12). Last abdominal segment in females is subtruncate. Lower eye lobe (below scape) is small, rounded and only about as long as gena below (Plate 115 fig. 9). Last antennomere in males is slightly longer than the length of the penultimate, and antennae are relatively long, longer than body with about 3-4 antennomeres (Plate 108 figs 3, 6). Anterior femora of males are slightly longer than the total length of head and pronotum combined. The lateral pronotal spines are short, blunt and slightly curved upward towards apex. Mesosternal process is relatively broad and slightly raised anteriorly. Terminal segment inside the internal sac of males is well sclerotized, broad and dagger-shaped, almost as long as apical and median segments combined (Plate 117 fig. 10).

The taxonomic position of *Nemoplophora* gen. nov.

Apart from the above mentioned morphological differences, *Anoplophora elegans* (Gahan, 1888) (Plate 109, figs 2, 5) exhibits some similarities with *Nemoplophora subcylindricus* (Aurivillius, 1927) comb. nov. The colour pattern of the abdominal ventrites (Plate 109, figs 2, 5) is similar. The aedeagus (Figs 29-30), the crescent shaped sclerites at proximal end of basal segment in males (Plate 118 fig. 16), parameres (Fig. 61), the membrane of median phallomer (Plate 119 fig. 7), and tergite VIII (Fig. 83) resemble those of *Nemoplophora subcylindricus* comb. nov. more than any other species of *Nemophas*. However, the elongated median sclerite inside internal sac in males, and especially the terminal segment is narrow and well sclerotised in *Nemoplophora subcylindricus* comb. nov. In *Anoplophora elegans* these characters are much broader and only weakly sclerotized (Plate 117 fig. 11). Many species of *Anoplophora* lack any sclerotized parts on the terminal segment (cf. Lingafelter & Hoebeke 2002). The elongated median sclerite inside internal sac and the terminal segment in *Nemoplophora subcylindricus* comb. nov. resemble more those found in *Pseudoemophas baluanus* (Aurivillius, 1923) (Plate 117 fig. 12), *Pseudonemophas versteegi* (Ritsema, 1881) (Plate 117 fig. 13), *Iothocera tomentosa* (Buquet, 1859) (Plate 117 fig. 14), *Dolichoprosopus leuciscus* (Pascoe, 1866) (Plate 117 fig. 15), and *Cornuscoparia annulicornis* (Heller, 1897) (Plate 117 fig. 16). The extension at the base of the inner margin of parameres is either absent or weakly developed, always located at the base of parameres and not forming any projection in *Anoplophora* spp. (Figs 61-63) (cf. Lingafelter & Hoebeke 2002). The crescent-shaped sclerites at proximal end of basal segment in males of *Pseudonemophas* spp. (Plate 118 fig. 17) and *Dolichoprosopus* (Plate 119 fig. 3) resemble those of *Ano-*

plophora and *Nemoplophora* gen. nov., whereas those of *Cornuscoparia* (Plate 119 fig. 4) differ from all examined species. The needle-shaped structures, inside the membrane of median phallomer, are typical in males of *Nemophas* (Plate 119 fig. 5) and are also found in *Iothocera* (Plate 119 fig. 10). In all other studied genera this character is absent or distinctly different, e. g. as a fishbone-like pattern in *Pseudoemophas baluanus* (Plate 119 fig. 9). The external characters of *Mimohammus biplagiatus* Breuning, 1950, especially the very long antennae in males, resemble *Nemophas* spp. However, the parameres are distinctly different (Fig. 68), male tergite VIII which is small with evenly rounded apical margin (Fig. 84), and the short and evenly curved aedeagus (Figs 31-32) are unique for *M. biplagiatus*.

***Nemoplophora subcylindricus* (Aurivillius, 1927) comb. nov.** (Figs 27-28, 59-60, 82, plate 108 figs 3, 6, plate 109 figs 1, 4, plate 114 figs 5-8, plate 115 figs 1, 9, plate 117 fig. 10, plate 118 fig. 15, plate 119 figs 7, 12)

Nemophas subcylindricus Aurivillius, 1927: 551. Type locality: Surigao, Mindanao Island. - Breuning 1944: 281, fig. 158; Breuning 1961: 337; Hüdepohl 1983: 186; Vitali & Nagirnyi 2009: 471-472.

= *Nemophas subcylindricus* var. *virescens* Aurivillius, 1927: 551. Type locality: Banguio, Luzon Island. - Breuning 1944: 281; Breuning 1961: 337; Vitali & Nagirnyi 2009: 471, fig. 2 syn. nov.

= *Nemophas zonatoides* Breuning, 1980: 174. Type locality: Mindanao Island. - Hüdepohl 1983: 186 (synonymy); Vitali & Nagirnyi 2009: 471.

Holotype ♂ USNM (examined by photo): Surigao, Mindanao, leg, Baker.

Additional material: 1♀ CUN, 32 mm, Mindanao; 1♀ CHW, 33.5 mm, Mindanao Island, Mount Diwata, Suriago del Sur, 2006-06; 1♂ CHW, 27 mm, Mindanao Island, Mount Diwata, Suriago del Sur, 2006-06; 1♀ CHW, 29 mm, Leyte Island, Mahaplag, Mount Balocaue, 2011-05; 1♂ MFN, Mindanao Island (*N. zonatoides* Breuning, 1980).

Holotype ♂ of *N. subcylindricus var. virescens*, NHRS, 25 mm, Baguio, Luzon, No. 5770 E94.

Remarks: Holotype ♂ (Plate 114 fig. 5) is preserved at USNM. Type locality: Mindanao (Surigao). The ♂ holotype of *N. subcylindricus* var. *virescens* (Plate 115 fig. 1) from the island of Luzon (Baguio) is preserved at NHRS, and the ♂ holotype of *N. zonatoides* (Plate 114 figs 6-7) is preserved at MNHN. A ♂ paratype of *N. zonatoides* is preserved at MFN (Plate 114 fig. 8). We consider both *N. subcylindricus* var. *virescens* syn. nov. and *N. zonatoides* syn. nov. to be colour varieties of *Nemoplophora subcylindricus* gen. nov., comb. nov.

Diagnose: A medium-sized and distinctly elongated species, with subcylindrical to cylindrical in both sexes, and body approximately 3x longer than wide in males, and approximately 3.2x longer than wide in females (Plate 108 figs 3, 6, plate 109 figs 1, 4). Male: length 27 mm, width 9 mm; females: length 29-33.5 mm, width 10-10.5 mm. The small eyes, short antennae in both sexes, the blunt and slightly curved pronotal lateral spines, the dense whitish or yellowish pubescence on pronotum, combined with the narrow transversal bands of whitish or yellowish pubescence on elytra, are unique characters for this species.

Redescription. Antennae: Scapes have microreticulation; consisting of very small punctures. The larger and scattered punctures are deep and very distinct, with the distance between the coarse punctures about twice the width of one coarse puncture medially (Plate 119 fig. 12). Antennae are black with a blue or green metallic lustre., Males have short antennae, longer than body with about three to four antennomeres, and in females only as long as body. Last antennomere in males is as long as (or only slightly longer) than penultimate. Head: Lower part of frons at the margin of the lower eye lobe and at the frontoclypeal margin, with fine whitish pubescence (Plate 115 fig. 9). The remaining part of head is glabrous and black with a green or blue metallic lustre. Eyes: Lower eye lobe (below scape) relatively small and rounded, as long as gena below. Pronotum: Anterior 2/3 of pronotum is covered with dense, whitish or yellowish pubescence, with about 10 longer, black setae along the posterior margin of the whitish or yellowish area. Posterior 1/5 of pronotum is glabrous, forming a slightly concave area reaching the base of lateral spines on pronotum. Basal part of lateral pronotal spines with a few long black setae. The lateral pronotal spines are short, oblique, blunt and slightly curved upward towards apex, slightly similar to *Nemophas* (*Pilomophas*) *ramosi*. Elytra: Apical part of elytra is smooth. The punctuation is relatively coarse on apical 1/2 of elytra, between the whitish to yellow transversal bands. On posterior ¼ of elytra the punctuation is fine and near apices the punctuation is very fine. Elytra are shining where the integument is exposed. Integument is black, with a distinct blue or green metallic lustre. Anterior part of elytra, between scutellum and humeri, has no pubescence The remaining part of elytra has

3-4 narrow and regular transversal bands, covered with whitish or yellowish pubescence. The areas between the whitish to yellowish bands on elytra (where the integument is exposed) are much broader than the adjacent bands. Scutellum is smooth, with only very weak whitish pubescence along the posterior margin. Ventral part of the body: Last abdominal ventrite in female is broadly rounded. Lateral part of mesosternum, posterior margin of metasternum, and the first three visible abdominal ventrites have very fine whitish pubescence. Mesosternal process is relatively broadly raised anteriorly (Plate 108 fig. 6, plate 109 fig. 4). Legs: Black and uniformly covered with very fine, whitish pubescence. Male genitalia. Aedeagus: 3.8 mm long and acutely curved towards apex. Dorsal ridge is as wide as ventral ridge, and both ridges are strongly narrowed towards apex (Figs 27-28). Colour is yellowish to brown. The two brownish and crescent-shaped sclerites are very long and weakly folded at the proximal end of the basal phallomer (Plate 118 fig. 15). Median phallomer has no trace of large punctures laterally, or needle-shaped structures projecting inward (Plate 119 fig. 7). Internal sac with basal, median and terminal segments exposed (Plate 117 fig. 10). Basal segment is membranous, tubular, rectangular and densely covered with small triangular-shaped microspinules. Median segment is membranous, very short. Terminal segment is elongate (almost as long as apical and median segments combined), well sclerotized, broad and dagger-shaped. The total length of basal, median and terminal segments is approximately 2.1 mm. Tegmen: 3.5 mm long, base of tegmen is extended and acutely curved dorso-ventrally on middle (Fig. 59). Parameres: Short and flattened dorso-ventrally, projecting inwards along inner margin and towards apex (Fig. 60). Base of inner margin is "U-shaped" with no trace of an extension or tooth-like plate (Fig. 60). Apex is evenly rounded along posterior margin with scattered fringes of relatively short, brownish hairs and a few longer setae, well concentrated at edge of apex. Surface of parameres have scattered punctures and fine hairs. Posterior surface of parameres is shining due to no micro-reticulation. The colour is dark brown. Tergite VIII: 2.3 mm long, almost square-formed with brownish pigmentation, posterior margin almost straight, and covered with short, fine brownish hairs and distally towards the posterior margin (Fig. 82). Surface medially, is smooth and with weak micro-reticulation.

Distribution: Philippines: the islands of Mindanao and Luzon (Plate 116 fig. 1).

Key to the genera *Anoplophora*, *Nemophas* and *Nemoplophora* gen. nov., including designation of new subgenus (*Pilomophas*)

1 Pronotum mostly with a raised posteromedial callus. Antennae often have conspicuous pubescent annulations on most antennomeres (Fig. 30). Scape is micro-reticulated with numerous and very fine (almost oblique) and shallow punctures. Last abdominal segment in females is subtruncate or notched. Last antennomere in males is less than twice the length of the penultimate, and antennae is relatively long (longer than body with about four to five antennomeres). The lateral pronotal spines are long and mostly straight towards apex. Anterior femora of males about as long as the total length of head and pronotum combined. Mesosternal process often broad and distinctly raised anteriorly. Male genitalia has base of inner margin of parameres, smooth or with a weakly developed "tooth-like extension" located at base (Figs 61-63). Terminal segment inside the internal sac is sclerotized, elongate and tubular, or compressed and broad (with well sclerotized lateral margins), much shorter than apical and median segments combined (Plate 117 fig. 11) .... *Anoplophora* Hope, 1839

\- Pronotum smooth (without a raised posteromedial callus). Antennae are without any trace of pubescent annulations. Scape coarsely reticulated with numerous shallow punctures (Plate 119 fig. 11). Last abdominal segment in females more or less pointed. Last antennomere in males more than twice the length of the penultimate, and antennae very long (longer than body with about six to seven antennomeres). The lateral pronotal spines are long and straight towards apex. Anterior femora of males about 1.5 times longer than the total length of head and pronotum combined. Mesosternal process relatively narrow and slightly raised anteriorly. Male genitalia: base of inner margin of parameres has an extension from each paramere forming a tooth-like plate strongly projecting forward, and terminal segment inside the internal sac of males well sclerotized, strongly elongate, rounded and needle-shaped; as long as, or longer than, apical and median segments combined .... *Nemophas* Thomson, 1864

- Pronotum smooth (without a raised posteromedial callus). Antennae (at least scape and following four antennomeres) completely covered with ocherous pubescence (Plate 108 figs 2, 5, 7-8). Last abdominal segment in females more or less pointed. Last antennomere in males more than twice the length of the penultimate, and antennae very long (longer than body with about six to seven antennomeres). The lateral pronotal spines are short, blunt and slightly curved upward towards apex. Mesosternal process relatively narrow and slightly raised anteriorly. Male genitalia: base of inner margin of parameres has a distinct, and very wide, extension from each paramere forming a plate strongly projecting forward (Fig. 58), and terminal segment inside the internal sac well sclerotized, large and deeply notched on the middle of the broadly rounded posterior margin. Terminal segment as long as apical and median segments combined: as long as apical and median segments combined (Plate 117 fig. 9) .... *Pilomophas (Nemophas)* subgen. nov.
- Pronotum smooth with apical 2/3 covered with whitish to yellowish pubescence (plate 108 figs 3, 6, plate 109 figs 1, 4). Antennae are without any trace of pubescent annulations. Scape is micro-reticulated with numerous large and deep punctures (Plate 119 fig. 12). Last abdominal segment in females is subtruncate. Lower eye lobe (below scape) is small, rounded and only about as long gena below it. Last antennomere in males is slightly longer than the length of the penultimate, and antennae relatively long (longer than body with about three to four antennomeres). Anterior femora of males slightly longer than the total length of head and pronotum combined. The lateral pronotal spines are short, blunt and slightly curved upward towards apex. Mesosternal process relatively broad and slightly raised anteriorly. Male genitalia: base of inner margin of parameres smooth (lack a tooth-like projection) (Fig. 60), and terminal segment inside the internal sac well sclerotized, broad and dagger-shaped. Terminal segment almost as long as apical and median segments combined (Plate 117 fig. 10) .... *Nemoplophora* gen. nov.

Key to species of *Nemophas* Thomson, 1864

1 Abdominal ventrites black (as in plate 105, figs 4-5). Metasternum glabrous and black, or at most with small orange median or lateral spots (more extensive in males) 2
- Abdominal ventrites and metasternum more extensively coloured (mostly yellowish or orange) pubescence (as in plate 103 figs 4-6) 3
2 Elytra with four to five irregular orange pubescent bands, integument shining black, shoulders orange, posterior pronotal margin black (Plate 105, figs 1-2). Internal sac with basal segment strongly elongated, and terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 2) .... *N. grayii*
- Elytral surface with irregular transversal greyish spots forming an indistinct band medially, integument dull black, pronotum and frons with greyish pubescence (Plate 102 figs 1-2), ventrally at least on the posterior margin of abdominal ventrites, covered with greyish pubescence. Internal sac with basal segment is short and square-formed. Terminal segment well sclerotized, relatively long and broad (Plate 117 fig. 17) .... *N. ammiralis*
3 Abdominal ventrites and metasternum covered with dark pubescence (mostly red or brownish as in plate 102 fig. 8, plate 103 figs 4, 8, plate 104 figs 4-5, 8) 4
- Abdominal ventrites and metasternum covered with bright pubescence (mostly bright orange, yellowish or ochreous as in plate 103 figs 5-6, plate 105 figs 6, 8, plate 106 figs 4-5, plate 107 fig 5, plate 108 figs 5, 8) 6
4 Elytra without coloured spots or transversal bands 5
- Elytra with coloured spots or cross-banded. Ventral surface covered with dark red to browning pubescence (except around coxae and on abdominal ventrites; last visible abdominal ventrite mostly black). Pronotum entirely covered with orange pubescence, elytra with orange transversal bands, or with irregular bands (Plate 104 figs 2-3, 5-6, 8). Internal sac with basal segment short and cone-shaped. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 1) .... *N. forbesi*
5 Ventral surface completely covered with dark red to browning pubescence. Pronotum entirely covered with orange to reddish pubescence, elytra uniformly black (Plate 102 figs 7-8, plate 103 figs 1, 4). Entire head dull green (Plate 115 fig. 2). Internal sac with basal segment is cone-shaped. Terminal segment well sclerotized, very long and narrow (needle-shaped) (Plate 117 fig. 18) .... *N. batoceroides*
- Ventral surface covered with dark red to browning pubescence (except around coxae). Pronotum is black, elytra metallic dark blue (Plate 103 figs 7-8, plate 104 figs 1, 4). Internal sac with basal segment is short and square-formed. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 20) .... *N. cyanescens*
6 Scape (first antennal segment) dull due to the integument being densely covered with very large punctures (apart from fine reticulation between the punctures) (Plate 119 fig. 13). Elytra densely covered with bright orange pubes-

cence interrupted with 4-6 narrow and glabrous, black bands (Plate 107 figs 2, 5, 9), frons, head and pronotum orange (Plate 115 fig. 6). Internal sac with basal segment long and cone-shaped. Terminal segment well sclerotized, long and relatively narrow (needle-shaped) (Plate 117 fig. 7) .... *N. websteri*

- Scape (first antennal segment) coarsely reticulated and only supplied with scattered fine and shallow punctures (Plate 119 fig. 11) 7

7 Humeri (dorsally and especially on the glabrous area on epipleuron) extensively granulate 8

- Humeri without distinct granulae or punctures (at most with very weak granulation) 12

8 Anterior part of elytra (between scutellum and humeri) mostly glabrous and without distinct punctures (only scattered and large, rounded granulae with the distance between granulae much greater than the width of the granulae. Elytra with four to five light greyish bands, shoulders with dark grey or black pubescence (Plate 107 figs 1, 4, 7-8). Internal sac with basal segment cone-shaped. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 6) .... *N. trifasciatus*

- Glabrous areas on anterior part of elytra (between scutellum and humeri) with numerous large punctures sometimes associated with more or less distinct granulae with the distance between punctures about the same as the width of each puncture 9

9 Antennomeres 1-3 (and head) entirely covered with ochreous or yellowish pubescence (Plate 115 fig. 8). Elytral surface light metallic green with two ochreous or yellowish transversal bands on the middle (the first band narrow and the second band almost twice as broad), and one smaller band near apex, anterior elytral margin and shoulders covered with yellowish pubescence, entire pronotum covered with yellowish pubescence (Plate 108 figs 2, 5, 7-8). Male genitalia: base of inner margin of parameres has a distinct, and very wide, extension from each paramere forming a plate projecting forward (Fig. 58), and internal sac with basal segment almost rectangular. Terminal segment well sclerotized, terminal segment strongly elongate, broad and deeply notched on the middle of the broadly rounded posterior margin (Plate 117 fig. 9) .... *N. (Pilomophas) ramosi*

- Antennomere 1-3 glabrous, without pubescence 10

10 Frons covered with bright yellowish or dull red pubescence, head dorsally and laterally black (as in plate 115 figs 3, 5, 7) 11

- Frons and head uniformly with ochreous pubescence (as in plate 115 fig. 4). Elytral surface dark metallic green with two broad yellowish transversal bands on the middle and one obtuse band near apex, anterior elytral margin and shoulders often with brownish pubescence (Plate 106 figs 1-2, 4-5), mesosternum and abdominal sternites entirely covered with light brownish or ochreous pubescence, posterior pronotal margin greyish, frons (and entire head) with ochreous pubescence (Plate 115 fig. 4). Internal sac with basal segment short and cone-formed. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 4) .... *N. rosenbergii*

11 Frons with bright yellowish pubescence extending onto antennal tubercles (as in plate 115 fig. 3), apical part of elytra (between scutellum and humeri) glabrous, or with weak ochreous pubescence, mesosternum with yellowish pubescence. Elytral surface shining black, or dark blue, with two yellowish transversal bands on the middle and one smaller band near apex (Plate 103 figs 2-3, 5-6), metasternum and posterior margin of abdominal ventrites 1-4 sometimes with yellowish pubescence, posterior pronotal margin black, frons with bright yellow pubescence (plate 115 fig. 3). Internal sac with basal segment short and cone-formed. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 19) .... *N. bicinctus*

- Frons with dull red pubescence not extending onto antennal tubercles (as in plate 115 fig. 5), apical part of elytra (between scutellum and humeri) with extensive red pubescence, mesosternum with red pubescence. Elytral pubescence consist of two-coloured bands (two broad yellow bands medially, and shoulders/apex with reddish pubescence), posterior pronotal margin black (Plate 106 figs 3, 6-8), frons red (Plate 115 fig. 5). Internal sac with basal segment almost cone-formed. Terminal segment well sclerotized, long and narrow (needle-shaped) (Plate 117 fig. 5) .... *N. tricolor*

12 Apical part of elytra (except apical margin and humeri) with extensive yellowish pubescence 13

- Apical part of elytra (including apical margin and humeri) glabrous. Elytra with small yellowish irregular spots, pronotum entirely covered with bright yellowish or orange pubescence only interrupted with a very small black (naked) spot on the middle of pronotum (Plate 105 figs 3, 6-8). Internal sac with basal segment almost square formed. Terminal segment well sclerotized, relatively short and narrow (needle shaped) (Plate 117 fig. 3) .... *Nemophas helleri*

13 Elytra with four broad yellowish or orange bands, sometimes with five bands with the smallest band near apex, the first band not entirely covering shoulders, posterior pronotal margin black (Plate 107 figs 3, 6, plate 108 figs 1-4). Lower part of frons yellowish (Plate 115 fig 7). Internal sac with basal segment strongly elongated. Terminal segment well sclerotized, long and relatively narrow (needle-shaped) (Plate 117 fig. 8) .... *N. zonatus*

- Elytra covered with large yellowish irregular spots (Plate 102 fig. 3, plate 104 fig. 7), posterior pronotal margin with larger spots not reaching shoulders, pronotum with yellowish pubescence interrupted with a large black (naked) longitudinal median spot across entire pronotum (male unknown) .... *N. bennigseni*

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Authors' note

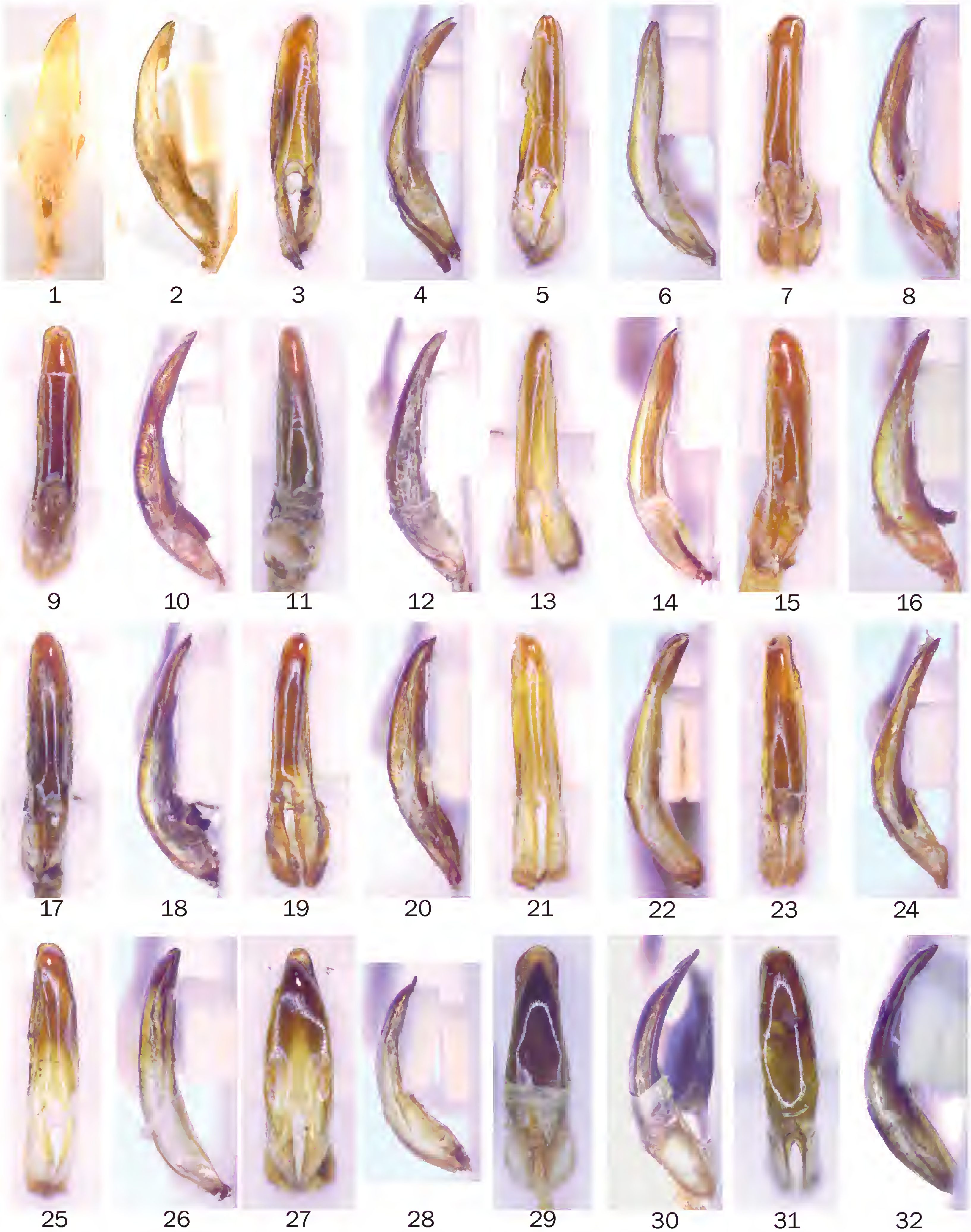
After the submission of the presented paper, we have become aware of a new publication on the genus *Nemophas* by Vitali (2013) *. Since we have not been able to study the specimens on which the mentioned paper is based we can only provide some general comments.

Nemophas nigriceps Vitali, 2013 and *Nemophas sumbaensis* Vitali, 2013 are described as new species based only on female specimens. The situation is consequently the same as for *N. bennigseni*, which we have regarded as "incertae sedis" due to the lack of male specimens. A correct placement in this genus, require study of male genitalia. This is in particular important for *N. sumbaensis,* since this species shows some untypical habitual characters compared to the other species in the genus *Nemophas*. *Nemophas nigriceps* Vitali, 2013 appears to be a synonym of *N. rosenbergii*. An examination of male specimens is required to confirm this.

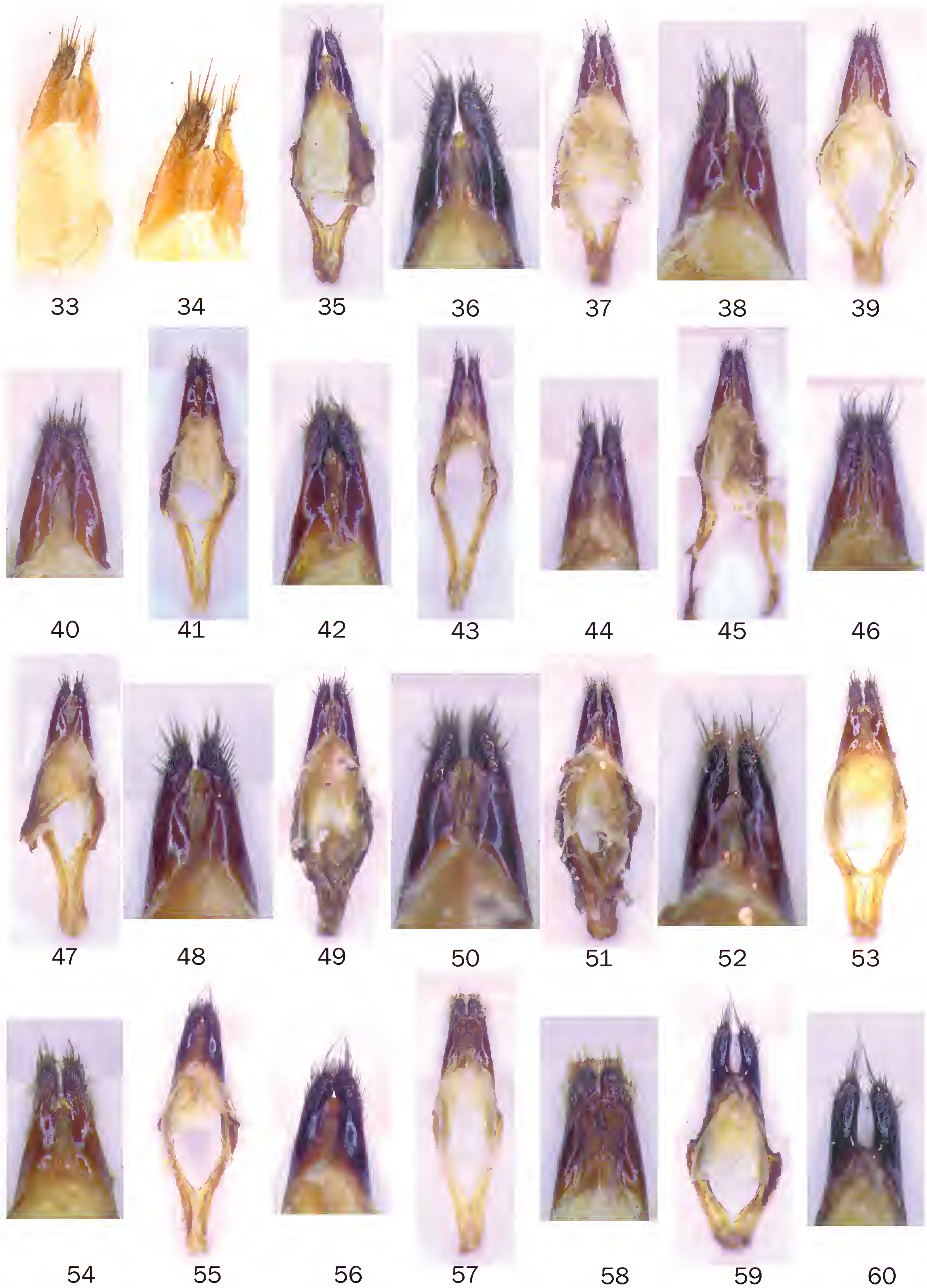
We regard the genera *Iothocera* and *Dolichoprosopus* as separate genera, not to be confused with *Nemophas*. These genera exhibit external characters and male genitalia characters that are unique. Especially the sclerites inside the internal sac show important characters on genus level. We have stressed the importance in using the characters of the sclerites inside the internal sac, as well as other internal sac characters, in order to separate *Nemophas* from the related genera. On this basis we have successfully identified existing species and described a new genus and a new subgenus.

In the abstract by Vitali (2013) it is stated that: "*Nemophas* Thomson, 1864, *Iothocera* Thomson, 1864 and *Dolichiprosopus* Ritsema, 1881, are compared and revised with emphasis on the genital morphology". With the exception of the parameres shown on figures 21-30, we cannot see that such a detailed study is presented.

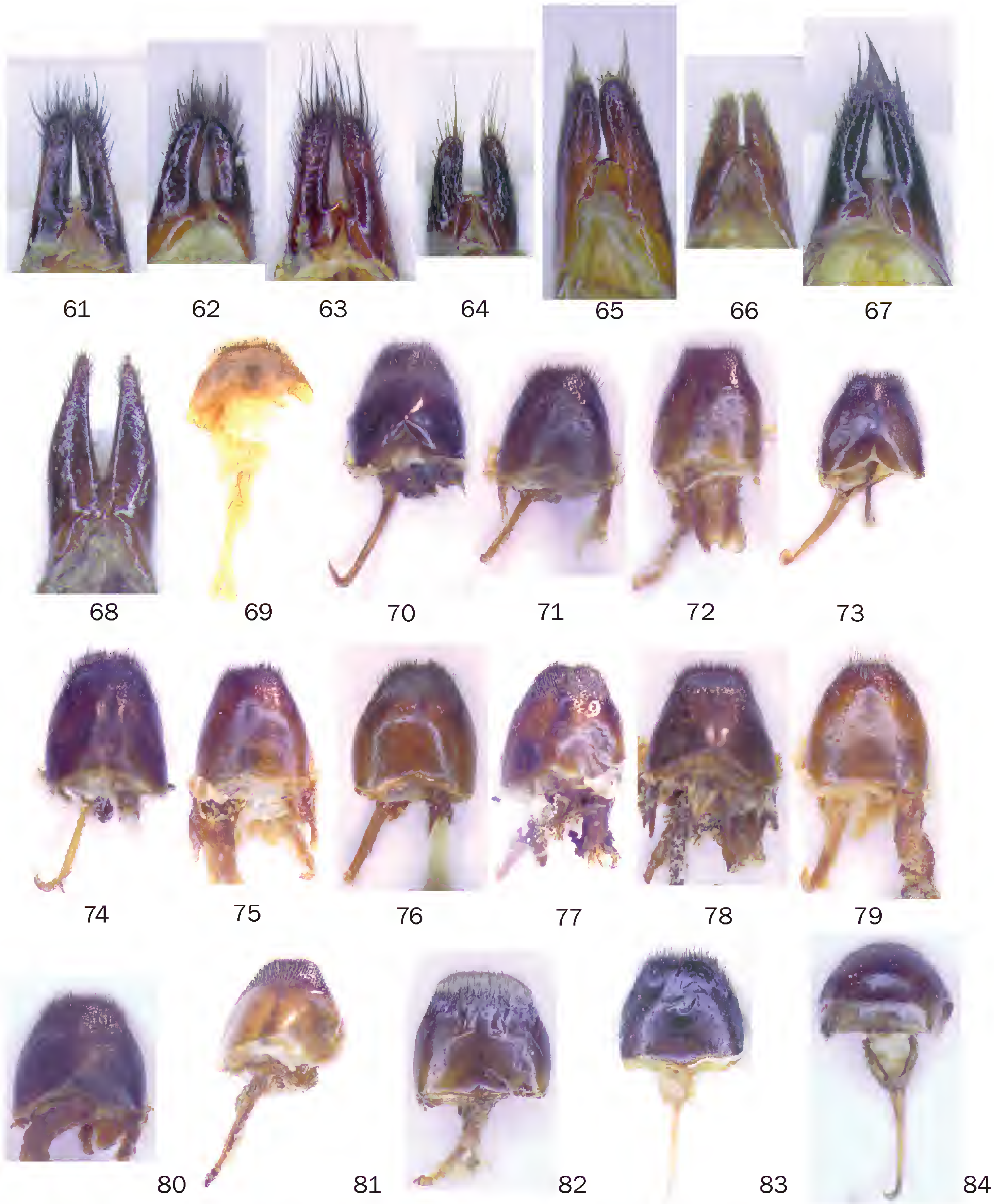
* Vitali F. 2013. Taxonomic revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae). – *Lambillionea* **113**, No. 3: 255-266.



Figures 1-32. Aedeagi of Cerambycidae species (left – ventral view, right – lateral view). 1-2 – *Nemophas ammiralis* Schwarzer, 1931, holotype; 3-4 – *N. batoceroides* Thomson, 1864; 5-6 – *N. bicinctus* Lansberge van, 1880; 7-8 – *N. cyanescens* Jordan, 1898; 9-10 – *N. forbesi* Waterhouse, 1884; 11-12 – *N. grayii* (Pascoe, 1859); 13-14 – *N. helleri* Hauser, 1904; 15-16 – *N. rosenbergii* Ritsema, 1881; 17-18 – *N. tricolor* Heller, 1896; 19-20 – *N. trifasciatus* Heller, 1919; 21-22 – *N. websteri* Jordan, 1898; 23-24 – *N. zonatus* Lansberge van, 1880; 25-26 – *N. (Pilomophas) ramosi* Schulze, 1920; 27-28 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 29-30 – *Anoplophora elegans* (Gahan, 1888); 31-32 – *Mimohammus biplagiatus* Breuning, 1950.



Figures 33-60. Parameres of Cerambycidae species, with median lobe and tegmen (plus parameres, magnified). 33-34 – *Nemophas ammiralis* Schwarzer, 1931, holotype [partly damaged by dermestids]; 35-36 – *N. batoceroides* Thomson, 1864; 37-38 – *N. bicinctus* Lansberge van, 1880; 39-40 – *N. cyanescens* Jordan, 1898; 41-42 – *N. forbesi* Waterhouse, 1884; 43-44 – *N. grayii* (Pascoe, 1859); 45-46 – *N. helleri* Hauser, 1904; 47-48 – *N. rosenbergii* Ritsema, 1881; 49-50 – *N. tricolor* Heller, 1896; 51-52 – *N. trifasciatus* Heller, 1919; 53-54 – *N. websteri* Jordan, 1898; 55-56 – *N. zonatus* Lansberge van, 1880; 57-58 – *N. (Pilomophas) ramosi* Schulze, 1920; 59-60 – *Nemoplophora subcylindricus* (Aurivillius, 1927).



Figures 61-84. Parameres with median lobe and tegmen (plus parameres, magnified) and male tergite VIII. 61-68 – Parameres. 61 – *Anoplophora elegans* (Gahan, 1888); 62 – *A. mamaua* Schultze, 1923; 63 – *A. granata* Holzschuh, 1993; 64 – *Pseudoemophas baluanus* (Aurivillius, 1923); 65 – *Pseudonemophas versteegi* (Ritsema, 1881); 66 – *Iothocera tomentosa* (Buquet, 1859); 67 – *Dolichoprosopus leuciscus* (Pascoe, 1866); 68 – *Mimohammus biplagiatus* Breuning, 1950; 69-84 – Tergite VIII. 69 – *Nemophas ammiralis* Schwarzer, 1931, holotype; 70 – *N. batoceroides* Thomson, 1864; 71 – *N. bicinctus* Lansberge van, 1880; 72 – *N. cyanescens* Jordan, 1898; 73 – *N. forbesi* Waterhouse, 1884; 74 – *N. grayii* (Pascoe, 1859); 75 – *N. helleri* Hauser, 1904; 76 – *N. rosenbergii* Ritsema, 1881; 77 – *N. tricolor* Heller, 1896; 78 – *N. trifasciatus* Heller, 1919; 79 – *N. websteri* Jordan, 1898; 80 – *N. zonatus* Lansberge van, 1880; 81 – *N. (Pilomophas) ramosi* Schulze, 1920; 82 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 83 – *Anoplophora elegans* (Gahan, 1888); 84 – *Mimohammus biplagiatus* Breuning, 1950.

To the knowledge of Macroheterocera of Southeast Asia and New Guinea. III. Tiger moths (Lepidoptera: Arctiidae: Arctiinae) of Papua Province, Indonesia

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Abstract: A small collection containing 18 species of the tiger moth subfamily Arctiinae from the western part of the island of New Guinea is presented and illustrated.

Key words: Lepidoptera, Arctiidae, Arctiinae, Indonesia, Papua Province, New Guinea.

Introduction

This publication is the third in a series[1] dedicated to Macroheterocera of Southeast Asia and New Guinea. It deals with a small collection of Tiger moths (Lepidoptera, Arctiidae) taken during a two-month long excursion to New Guinea by the first author together with V.V. Sinyaev (Moscow, Russia). The places and dates of collection are described in detail and illustrated in our previous publication in this book (page 157, plate 5).

Unfortunately, there has never been a revision or review of the Tiger moths populating New Guinea. Scattered data on the taxonomy and faunistic records of this very attractive group of moths are present in numerous publications listed at the end of this article. It is noteworthy; however, that fairly complete information concerning this moth family is available at http://www.papua-insects.nl/insect%20orders/Lepidoptera/Erebidae/Arctiinae/Arctiinae%20list.htm (De Vos 2013).

In our studies, we do not accept the proposed classification of Lepidoptera which is based on molecular data from a few individual genes. Instead we refer to our previous publication in the present volume (Gorbunov, Zamesov 2014a). In addition, we have nothing against dividing the family Noctuidae *sensu classico* into two separate families: Erebidae and Noctuidae, but we disagree with reducing the ranks of such well-defined and we believe natural family-level taxa as, for example, Arctiidae, Aganaidae or Lymantriidae.

Because Arctiidae species tend to be widespread, with numerous subspecies or forms for nearly all of them delimited, we have restricted the synonymy lists mainly to the taxa described from New Guinea and neighbouring archipelagos. In addition, we have excluded all homonyms and infrasubspecific names. All synonyms in the text are given in quotation marks because they have been checked in original publications.

We have found 18 species representing eight genera which is about 31% and 72.7% of Tiger moths fauna of the Indonesian Papua, respectively. All of them have been collected in new localities, thus providing new faunistic records. All taxa mentioned and illustrated herein are housed in the collection of the first author.

Material and methods

Specimens examined for this study were collected by the first author (see above) using two vertical nylon sheets, mainly from 7 p.m. to 6 a.m. For both sheets a 250 watt blended-light lamp

1 – The first publication in the series concerns the family Aganaidae (Lepidoptera: Noctuoidea) of Papua Province, Indonesia. It is published in the present volume on pp 157-165, pls 5-7. The second publication is on the family Sphingidae of Papua Province, Indonesia. Its is published in the present volume on pp 167-185, pls 8-12.

powered by a portable inverter generator Fubag® IT 1000 was used. The images of specimens were taken with a digital camera Sony® α450 with a lens Minolta® AF 50macro. The pictures were arranged with Adobe® Photoshop® CS5.

Key to the genera of Arctiinae Leach, 1815 (Lepidoptera: Arctiidae) of Papua Province, Indonesia by external characters

1 Proboscis fully developed, functional 2
– Proboscis reduced, non-functional 7
2 Forewing with more or less developed semitransparent area .... *Amerila* Walker, 1855
– Forewing without semitransparent area 3
3 Wings with yellow, orange and red scales 4
– Wings with dark brown or black and white scales ... 6
4 Forewing with red spots .... *Utetheisa* Hübner, 1819 ["1816"], part
– Forewing with yellow or orange scales 5
5 Forewing dark brown with a broad, oblique, orange band .... *Heliozona* Hampson, 1901
– Forewing yellow with brown spots .... *Argina* Hübner, 1819 ["1816"]
6 Abdomen dorsally without contrast coloured strips or spots, if spots present then outer margin of hindwing with white spots .... *Utetheisa* Hübner, 1819 ["1816"], part
– Abdomen dorsally with contrast coloured strips or spots; outer margin of hindwing without white spots .... *Nyctemera* Hübner, 1820 ["1816"]
7 Forewing colour pattern with longitudinal stripe or bands 8
– Forewing colour pattern with spots 9
8 Wings white; forewing with red or orange costal margin .... *Paramsacta* Hulstaert, 1923
– Wings ochre to light grey-brown; forewing with a broad, black, discontinuous band medially .... *Creatonotos* Hübner, 1819 ["1816"]
9 Hind tibia with a pair of spurs .. *Lemyra* Walker, 1856
– Hind tibia with two pairs of spurs 10
10 Forewing with an oblique row of rounded black spots; hindwing with a black discal spot only .... *Nicetosoma* De Vos, 2011
– Colour pattern of both fore- and hindwing different .... .. *Spilosoma* Curtis, 1825 and *Spilaethalida* Dubatolov, De Vos & Daawia, 2007 [2]

List of the Arctiinae Leach, 1815 (Lepidoptera: Arctiidae) of Papua Province, Indonesia

***Spilosoma* Curtis, 1825**

"*Spilosoma* ..." - Curtis 1825: pl. 92. Type species: *Bombyx menthastri* [Denis & Schiffermüller], 1775 [= *Phalaena lubricipeda* Linnaeus, 1758], by original designation.
= "Genus *Rhagonis*, n. g." - Walker 1862: 170. Type species: *Rhagonis bicolor* Walker, 1862 [= *Arctia vagans* Boisduval, 1852], by monotypy.
= "*Rhodareas*." - Kirby 1892: 254. Type species: *Arctia melanopsis* Walker, 1864, by subsequent designation by Watson et al. 1980: 170.

Note: Unfortunately, at present there is no consensus concerning the composition and structure of the genus. What is clear is that "it contains a number of distinctive groups and is probably paraphyletic (Holloway 1988: 41). Usually the genus is restricted to a few species groups (De Vos, Suhartawan 2011). We can only state that the systematics of this genus is far from perfect and it requires further careful research. According to the website of the British Museum (http://www.nhm.ac.uk), there are more than two dozen junior synonyms of *Spilosoma* Curtis, but we believe there is no need to quote all of them here.
At present, 24 species of the genus have been collected in Indonesian Papua (De Vos 2013). We have on hands only three species from the province.
Distribution: We think this genus is ubiquitous, occurring throughout the world.

***Spilosoma dinawa* (Bethune-Baker, 1904)** (Plate 120 figs 1-2)

"*Diacrisia dinawa* spec. nov." - Bethune-Baker 1904: 413, pl. 5, fig. 25. Type locality: "Papua New Guinea: British New Guinea, Dinawa, 4000 ft, ..." [= Papua New Guinea: Central Province, Dinawa], by lectotype fixed by De Vos and Suhartawan (2011: 304).
= "*Diacrisia ochrifrons*, sp. n." - Joicey & Talbot 1917: 50. Type locality: "Wandammen Mtns., 3000–4000 feet, ..." [= Indonesia: West Papua, Wandammen Peninsula, Wandammen Mts].

Material examined: 1♀ (Plate 120 figs 1-2), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I–02.II.2009.
Note: De Vos and Suhartawan (2011) have revised this highly variable species.
Distribution: This species seems to be an endemic to New Guinea.

***Spilosoma costata* (Boisduval, 1832)** (Plate 120 figs 3-6)

"C.[*helonia*] *costata*. Boisd." - Boisduval 1832: 213, pl.

2 — These two genera cannot be separated by the external characters.

5, fig. 6. Type locality: "... la Nouvelle-Irlande. ... du Port-Praslin." [= Papua New Guinea: New Ireland province, Port Praslin].
= "*D.*[*iacrisia*] *costata vivida* subspec. nov." - Rothschild 1910: 139. Type locality: "Papua New Guinea: Fergusson Island, ..." [= Papua New Guinea: Milne Bay Province, Fergusson Island].

Material examined: 1♂, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008–02.I.2009; 2♂, same locality, 31.XII.2008; 3♂, same locality, 25.I.2009; 2♂, same locality, 25–26.I.2009; 1♂ (Plate 120 figs 3-4), same locality, 25.I–02.II.2009; 2♂, same locality, 25.I–02.II.2009; 1♀ (Plate 120 figs 5-6), same locality, 30.XII.2008–02.I.2009.
Note: It can be easy distinguished from the New Guinean congener by the specific pattern of the forewing which is yellow with brown veins. This species has been revised by De Vos and Suhartawan (2011).
Distribution: New Guinea and the islands off to the northeast (the Bismarck Archipelago, D'Entrecasteaux Islands).

***Spilosoma styx* (Bethune-Baker, 1910)** (Plate 120 figs 13-14)
"*Diacrisia styx*, sp. n." - Bethune-Baker 1910: 443. Type locality: "Ninay Valley (Arfak Mountains), 3600 feet." [= Indonesia: West Papua, Arfak Mts, Neney Valley].
= "*Spilosoma styx* B.-Bkr. (1910) *albistriga* subsp. nov." - Talbot 1929: 88. Type locality: "Dutch New Guinea, Weyland Mountains, Nomnaginé, 25 miles south of Wangaar" [= Indonesia: Papua, Kobowre (Weyland) Mts].

Material examined: 1♂ (Plate 120 figs 13-14), Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 10–13.I.2009.
Note: This species can easily be distinguisched from the other Tiger moths of New Guinea by the wing coloration. It seems to be a rare species. At present, only a few specimens are known, all from the western part of the island of New Guinea. This species is divided into two subspecies, which we think this is hardly justified. De Vos and Suhartawan (2011) have revised this species.
Distribution: The species seems to be an endemic to the Indonesian part of New Guinea.

***Spilaethalida* Dubatolov, De Vos et Daawia, 2007**
"*Spilaethalida* Dubatolov, De Vos & Daawia, gen. n. " - Dubatolov et al. 2007: 324. Type species: *Spilarctia turbida* Butler, 1882, by original designation.
Note: This genus has been separated from *Spilosoma* Curtis by the structure of the male genitalia. Those authors have included only two species into the genus, the second species (*Spilosoma erythrastis* Meyrick, 1886) only due to its external resemblance to the type species (Dubatolov et al. 2007). Only a single species occurs in New Guinea. It is represented in our material.
Distribution: Restricted to New Guinea and northeastern Australia.

***Spilaethalida turbida* (Butler, 1882)** (Plate 120 figs 7-12)
"*Spilarctia turbida*, sp. n." - Butler 1882: 158. Type locality: "Duke-of-York Island." [= Papua New Guinea: East New Britain Province, Duke of York Island].
= "*Spilarctia Meeki*, sp. n." - Druce 1899: 234. Type locality: "Trobriand Island, Kiriwini ..." [= Papua New Guinea, Milne Bay Province, Kiriwina Island].
= "*D.*[*iacrisia*] *turbida woodlarkiana* subspec. nov." - Rothschild 1910: 145. Type locality: "... Woodlark, ..." [= Papua New Guinea, Milne Bay Province, Woodlark Island], by lectotype fixed by De Vos and Suhartawan, (2011: 328).
= "*D.*[*iacrisia*] *turbida montana* subspec. nov." - Rothschild 1910: 145. Type locality: "Angabunga R., affl. of St. Joseph R., Brit. N. Guinea, 6000 ft., ..." [= Papua New Guinea, Central Province, Angabunga River], by lectotype fixed by De Vos and Suhartawan (2011: 328).
= "*D.*[*iacrisia*] *turbida sordidior* subspec. nov." - Rothschild 1910: 146. Type locality: "... Biagi, Mambare R., 5000 ft., ..." [= Papua New Guinea, Oro Province, Mambare River], by lectotype fixed by De Vos and Suhartawan (2011: 327).
= "*D.*[*iacrisia*] *turbida alpina* nom. nov. (= *montana* Rothsch.)" - Rothschild 1914: 247, pl. 23, row a, b. Type locality: "Angabunga R., affl. of St. Joseph R., Brit. N. Guinea, 6000 ft., ..." [= Papua New Guinea, Central Province, Angabunga River], by lectotype of *Diacrisia turbida montana* Rothschild 1910 designated (according to art. 72.7 ICZN (ICZN, 1999) and fixed by De Vos and Suhartawan (2011: 328).

Material examined: 1♂ (Plate 120 figs 11-12), Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26–29.XII.2008; 1♂ (Plate 120 figs 7-8), same locality, 04–06.II.2009; 1♂, same locality, 04–06.II.2009; 2♀, same locality, 26–29.XII.2008; 1♀ (Plate 120 figs 9-10), same locality and date; 1♂, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25–26.I.2009; 1♂, same locality, 25.I–02.II.2009.
Note: This quite variable species has been revised by De Vos and Suhartawan (2011), who divided it into two subspecies: the nominotypical one and

meeki Druce, 1899. The nominotypical subspecies in known to occur through the mainland of New Guinea.
Distribution: This species is widespread in New Guinea and the islands off to the northeast.

Lemyra Walker, 1856

"Genus *Lemyra*." - Walker 1856: 1690. Type species: *Lemyra extensa* Walker, 1856, by monotypy.
= "Genus *Thyrgorina*." - Walker, 1864: 317. Type species: *Thyrgorina spilosomata* Walker, 1864, by monotypy.
= "Genus *Echlida*." - Walker, 1865: 386. Type species: *Echlida subjecta* Walker, 1865, by monotypy.
= "Genus *Icambosida*." - Walker 1865: 400. Type species: *Icambosida nigrifrons* Walker, 1865, by monotypy.
= "*Thanatarctia*, n. gen." - Butler 1877: 395. Type species: *Thanatarctia infernalis* Butler, 1877, by original designation.
= "*Cabrisa*, gen. nov." - Moore 1879a: 41. Type species: *Cabrisa venosa* Moore, 1879, by monotypy.
= "*Challa*, n. g." - Moore, 1879b: 398. Type species: *Challa discalis* Moore, 1879, by subsequent designation by Kirby (1892: 359).

Note: Superficially the species of this genus resemble those of the genera *Spilosoma* Curtis, 1825 and *Spilaethalida* Dubatolov, De Vos et Daavia, 2007. *Lemyra* Walker currently contains ca 70 species, revised by Thomas (1990).
At present three species are known to occur in Indonesian Papua. We have on hands only one species from the province.
Distribution: The genus occurs in the eastern Palaearctic, in the Oriental and the northern part of the Australian regions.

Lemyra punctatostrigata (Bethune-Baker, 1904) (Plate 120 figs 15-16)

"*Maenas punctatostrigata* spec. nov." - Bethune-Baker 1904: 142, pl. 6, fig. 15. Type locality: "Mount Kebea, Dinawa, Aroa River ..." [= Papua New Guinea: Central Province, Dinawa].
= "*Spilosoma avola* spec. nov." - Bethune-Baker 1908: 190. Type locality: "Avola, 6000 ft., ..." [= Papua New Guinea].
= "*Maenas punctatostrigata* B.-Bkr. (1904) *ceramensis* subsp. nov." - Talbot 1929: 89. Type locality: "Central Ceram, ..." [= Indonesia: Maluku, Seram Island].

Material examined: 1♂, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008–02.I.2009; 1♂, same locality, 31.XII.2008 (Plate 120 figs 15-16).
Note: It is a rather rare species known from a few localities only (De Vos 2013).
Distribution: The island of Seram of Maluku Province of Indonesia, New Guinea. Probably it inhabits other islands of the Maluku Archipelago as well.

Nicetosoma De Vos, 2011

"*Nicetosoma* gen. nov." - De Vos 2011: 111. Type species: *Phalaena niceta* Stoll, 1782, by original designation.

Note: The species of the genus differ from those of the genus *Spilosoma* Curtis, 1825 and other related genera of the tribe Spilosomini by the coloration and pattern of the wings. Beside that, *Necetosoma* species show sexual dimorphism. The female is more large and robust with broader forewing and curved costal margin. At present the genus contains nine species (De Vos 2011), of which two are known to be from New Guinea. We have on hands a single species only.
Distribution: It occurs on New Guinea and surrounding islands ranging from North Maluku Islands in the west to Solomon Islands in the east.

Nicetosoma papuana (Rothschild, 1910) (Plate 120 figs 17-24)

"*D.*[*iacrisia*] *niceta papuana* subspec. nov." - Rothschild 1910: 152. Type locality: "Papua New Guinea: Deutsch Neu Guinea, Sattelberg, ..." [= Papua New Guinea: Morobe Province, Sattelberg], by lectotype fixed by De Vos (2011: 118).
= "*D.*[*iacrisia*] *niceta intermedia* subspec. nov." - Rothschild 1910: 153. Type locality: "Papua New Guinea: British New Guinea, Milne Bay, ..." [= Papua New Guinea: Milne Bay Province], by lectotype fixed by De Vos (2011: 118).
= "*Diacrisia niceta mysolica* subsp. nov." - Rothschild 1915: 210. Type locality: "Misol." [= Indonesia: West Papua, Raja Ampat Islands, Misool Island].
= "*Diacrisia niceta pallida* subsp. nov." - Rothschild 1916: 333. Type locality: "Vulcan Island" [= Papua New Guinea: Manus Province, Manus Island].

Material examined: 1♂, Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 28.XII.2008; 1♂ (Plate 120 figs 19-20), same locality, 26–29.XII.2008; 4♂, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 30.XII.2008–02.I.2009; 1♂, same locality, 31.XII.2008; 1♂, same locality, 25.I.2009; 1♂ (Plate 120 figs 17-18), same locality, 25–26.I.2009; 1♂, same locality and date; 1♂ (Plate 120 figs 21-22), same locality, 25.I–02.II.2009; 1♂, same locality and date; 1♀ (Plate 120 figs 23-24), Indonesia,

Papua, Taritatu riv., SE of Dabra, 03°15'S, 138°34'E, 60 m, 05–16.I.2009.
Note: This taxon has been elevated to a full species and revised by De Vos (2011). It is a rather variable species both in coloration and in size.
Distribution: It inhabits New Guinea and islands off to the west (Aru Islands, Raja Ampat Islands).

***Argina* Hübner, 1819 ["1816"]**
"*Argina* ..." - Hübner 1819 ["1916"]: 167. Type species: *Phalaena cribraria* Clerck, 1764 ["1759"] [nec *Phalaena cribraria* Linnaeus, 1758] [= *Phalaena astrea* Drury, 1773], by subsequent designation by Kirby (1892: 350).

Note: The maculate wings pattern and the shape of the anal area of the hindwing in males cannot confuse this genus with any Arctiidae of Indonesian Papua. At present, it contains only three species, of which one is known to be from New Guinea.
Distribution: Afrotropical, Oriental and Australian regions from eastern Africa and Madagascar in the west to New Guinea and eastern Australia in the east.

***Argina astrea* (Drury, 1773)** (Plate 121 figs 1-4)
"*Astrea* ... *Phal*.[*aena*] *Noct*.[*ua*]" - Drury 1773: [91], pl. 6, fig. 3. Type locality: "... from the Gold Coast ... in Africa." (loc. cit.: 11) [= Australia: Queensland, Gold Coast (?)].
= "[*Bombyx*] *Pylotis*." - Fabricius 1775: 585. Type locality: "... in nova Hollandia." [= Australia].

Material examined: 1♂ (Plate 121 figs 1-2), Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26–29.XII.2008; 1♂ (Plate 121 figs 3-4), same locality, 04–06.II.2009.
Note: The species is extremely variable in wing maculation patterns as well as background coloration. It is divided into two subspecies, of which the nominotypical one inhabits the Oriental and Australian regions.
Distribution: It is widespread in the tropical areas from eastern Africa and Madagascar in the west to New Guinea and eastern Australia in the east.

***Utetheisa* Hübner, 1819 ["1816"]**
"*Utetheisa* ..." - Hübner 1819 ["1816"]: 168. Type species: *Phalaena ornatrix* Linnaeus, 1758, by subsequent designation by Kirby (1892: 345).
= "*Deiopeia* ..." - Curtis 1827: 169. Type species: *Phalaena pulchella* Linnaeus, 1758, by original designation.
= "*Pitasila*, n. g." - Moore 1877: 599. Type species: *Pitasila leucospilota* Moore, 1877, by monotypy.
= "*Atasca*. Gen. Nov." - Swinhoe 1892: 139. Type species: *Phalaena pellex* Linnaeus, 1758, by subsequent designation by Roepke (1949: 47).
= "*Exitelica*, nov." - Turner 1921: 160. Type species: *Leptosoma aegrotum* Swinhoe, 1892, by monotypy.
= "Subgenus *Raanya* subgen. n." De Vos 2007b: 81. Type species: *Deilemera albipuncta* Druce, by original designation.

Note: This is a large genus containing ca 60 species. At present, it is divided into four subgenera (De Vos 2007b). Superficially, many of them resemble species of the genus *Nyctemera* Hübner. Only five species from three subgenera have been recorded in New Guinea (De Vos 2013), of which a single species is present in our collection.
Distribution: This genus is distributed worldwide.

***Utetheisa pellex* (Linnaeus, 1758)** (Plate 121 figs 5-16)
"*Phalaena*. ... *pellex*." - Linnaeus 1758: 510. Type locality: "In Indiis [East Indies]" [= East India], by lectotype fixed by Mikkola, Honey (1993: 148).
= "*L*.[*eptosoma*] *Artemis*. Boisd." - Boisduval 1832: 199. Type locality: " ... N. Guinea; ..." [= New Guinea], by lectotype fixed by De Vos (2007b: 70).
= "*Nyctemera simplex*." - Walker 1864: 207. Type locality: "New Guinea.".
= "*Deilemera signata*, n. sp." - Butler 1878: 386. Type locality: "Darnley Island ..." [= Australia: Queensland, Darnley Island].
= "*Pseudocallimorpha Doriae*, Oberthür (species nova)." - Oberthür 1880: pl. 4, fig. 2. Type locality: "Nova Guinée, Sorong, ..." (De Vos 2007b: 70) [= Indonesia: West Papua, Sorong].
= "*Deilemera paradelpha*, nov." - Swinhoe 1917: 411. Type locality: "Fergusson D'Entrecasteaux Islae, ..." [= Papua New Guinea: Milne Bay Province, D'Entrecasteaux Islands, Fergusson Island], by lectotype fixed by De Vos (2007b: 70).

Material examined: 1♂ (Plate 121 figs 13-14), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂, 1♀, same locality and date; 1♂ (Plate 121 figs 11-12), 2♀, same locality 30.XII.2008–02.I.2009; 1♂ (Plate 121 figs 7-8), same locality, 25.I.2009; 1♂, 1♀, same locality and date; 2♂, 1♀, same locality, 25.I–02.II.2009; 1 ♀ (Plate 121 figs 9-10), same locality, 25–26.I.2009; 1♂ (Plate 121 figs 5-6), same locality, 27–30.I.2009; 1♂, 1♀, same locality and date; 1♀ (Plate 121 figs 15-16), same locality, 25.I–02.II.2009; 1♂, Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05–07.I.2009.
Note: This is an extremely variable and common species, revised by De Vos (2007b).

Distribution: It occurs in New Guinea and surrounding islands from Waigeo in the west to Vanuatu in the east, known from Queensland in Australia as well (De Vos 2007b).

***Nyctemera* Hübner, 1820 [“1816”]**

“*Nyctemera* ...” - Hübner 1820 [“1816”]: 178. Type species: *Phalaena lacticinia* Cramer, 1777, by subsequent designation by Hampson (1894: 46).

= “*Deilemera* ...” - Hübner 1820 [“1816”]: 179. Type species: *Phalaena evergista* Stoll, 1781, by monotypy.

= “*Orphanos* ...” - Hübner 1825 [“1816”]: 306. Type species: *Phalaena tripunctaria* Linnaeus, 1858, by subsequent designation by Wantson et al. (1980: 136).

= “*Leptosomum*;” - Blanchard 1840: 488. Type species: *Leptosoma insulare* Boisduval, 1833, by monotypy.

= “*Agagles* ...” - White 1841: 482. Type species: *Agagles amicus* White, 1841, fixed by monotypy.

= “*Trypheromera*, gen. nov.” - Butler 1881: 45. Type species: *Nyctemera plagifera* Walker, 1854, by original designation.

= “... a sub-genus, ...*Arctata*.” - Roepke 1949: 50. Type species: *Nyctemera arctata* Walker, 1856, by monotypy.

= “... a new subgenus, ...*Coleta*.” - Roepke 1949: 53. Type species: *Phalaena coleta* Stoll, 1781, by monotypy.

= “*Luctuosana* De Vos subgen. nov.” - De Vos *in*: Dubatolov 2010: 17. Type species: *Leptosoma luctuosum* Snellen van Vollenhoven, 1863, by original designation.

= “*Tritomera* De Vos & Dubatolov subgen. nov.” - De Vos & Dubatolov *in*: Dubatolov 2010: 18. Type species: *Nyctemera trita* Walker, 1854, by original designation.

Note: This is a rather numerous genus containing somewhat more than 70 species, which are grouped in seven subgenera (De Vos, Dubatolov 2010). Roepke (1949, 1957) has revised the species of the genus mostly from the Southeast Asia. Besides that, there are some important publications concerned some species or species groups of the genus (Holloway 1988; De Vos 1995a & b, 1996, 1997a & b, 2002, 2007a; De Vos, Černý 1999).

At present, 14 species are known from New Guinea, of which we have on hands four species only.

Distribution: This genus distributes in the Oriental and Australian regions from North India in the west to New Zealand in the east.

***Nyctemera groenendaeli* De Vos, 1995** (Plate 122 figs 1-2)

“*Nyctemera groenendaeli* spec. nov.” - De Vos 1995: 482, fig. 1. Type locality: “Ampas, W. Irian, ...” [= Indonesia: Papua, Jayapura Regency, Ampas].

Material examined: 1♂ (Plate 122 figs 1-2), Indonesia, Papua, Genyem env., 02°38’S, 140°10’E, 500 m, 31.XII.2008.

Note: In the original description De Vos wrote that “... only eight specimens are known from the four different localities” and “... *N. groenendaeli* is very likely a rare species” (De Vos 1995: 486).

Distribution: This species seems to be an endemic to the island of New Guinea.

***Nyctemera latimargo* (Rothschild, 1915)** (Plate 122 figs 3-4)

“*Deilemera absurdum latimargo* subsp. nov.” - Rothschild 1915a: 78. Type locality: “Dutch New Guinea, Base Camp, Setakwa River, ...” [= Indonesia: Papua, Setakwa River], by lectotype fixed by De Vos (2007a: 49).

Material examined: 1♂ (Plate 122 figs 3-4), Indonesia, Papua, Genyem env., 02°38’S, 140°10’E, 500 m, 31.XII.2008; 1♂, same locality, 27–30.I.2009.

Note: This species was revised by De Vos (2007a).

Distribution: It is an endemic of New Guinea and presently knows from few localities in the province of Papua, Indonesia (De Vos 2007a).

***Nyctemera baulus* (Boisduval, 1832)** (Plate 121 figs 17-24)

“*L*.[*eptosoma*] *baulus*. Boisd.” - Boisduval 1832: 200. Type locality: “... à Bourou.” [= Indonesia: Maluku Islands, Buru Island].

= “*Nyctemera alba* Pagenstecher.” - Pagenstecher 1901: 135. Type locality: “... Samoa.” [= Independent State of Samoa].

= “*Nyctemera aluensis*, sp. n.” - Butler 1887: 222. Type locality: “Alu Island ...” [= Solomon Islands, Shortland Island].

= “*Deilemera illustris*, nov.” - Swinhoe 1903: 77. Type locality: “Alu, Solomon Islands.” [=Solomon Islands, Shortland Island].

= “*Deilemera nisa*, nov.” - Swinhoe 1903: 77. Type locality: “Sangir ...” [= Indonesia: North Sulawesi, Sangihe Islands].

Material examined: 1♂ (Plate 121 figs 17-18), 1♀ (Plate 122 figs 23-24), Indonesia, Papua, Genyem env., 02°38’S, 140°10’E, 500 m, 30.XII.2008–02.I.2009; 2♂, 1♀, same locality and date; 4♂, 1♀, same locality, 31.XII.2008; 1♀ (Plate 121 figs 21-22), same locality, 25.I.2009; 3♂, 2♀, same locality and date; 1♂ (Plate 121 figs 19-20), same locality, 25.I–02.II.2009; 2♂, same locality, 27–30.I.2009.

Note: This is a rather common and variable species everywhere throughout its distribution area. At

present it is divided into three or four subspecies, of which the nominotypical one populates the island of New Guinea.
Distribution: It is widespread from the Nicobar Islands of India in the west to Samoa in the east (De Vos 2013).

Nyctemera evergista **(Stoll, 1781)** [3] (Plate 122 figs 5-12)

"*Evergista*. *Phaléne* ..." - Stoll *in* Cramer 1781: 155, pl. 369, fig. E. Type locality: "... l'isle d'Amboine." [= Indonesia: Maluku, Ambon Island].
= "*L*.[*eptosoma*] *aeres*. Boisd." - Boisduval 1832: 198. Type locality: "... à Bourou, à Offack et à la Nouvelle-Guineé." [= Indonesia: Maluku, Buru Island; West Papua: Raja Ampat Islands; New Guinea Island].
= "*L*.[*eptosoma*] *agagles*. Boisd." - Boisduval 1832: 198. Type locality: "... à Offack." [= Indonesia: West Papua, Raja Ampat Islands].
= "*Nyctemera Menes* Feld." - Felder 1861: 38. Type locality: "Amboina (Felder, 1861: 25)" [= Indonesia: Maluku, Ambon Island].
= "*Nyctemera intercisa*." - Walker 1864: 205. Type locality: "Amboina." [= Indonesia: Maluku, Ambon Island].
= "*Nyctemera mutabilis*." - Walker 1864: 206. Type locality: "Amboina." [= Indonesia: Maluku, Ambon Island].
= "*Deilemera uniplaga*, nov." - Swinhoe 1903: 61, pl. 3, fig. 2. Type locality: "Fergusson Isl. ..." [= Papua New Guinea: Milne Bay Province, Fergusson Island].
= *Nyctemera evergista bismarckiana* ssp. n." - De Vos 2002: 24, figs 33, 34. Type locality: "New Ireland, ..." [= Papua New Guinea: New Ireland Province, New Ireland Island].

Material examined: 1♂, Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 26–29.XII.2008; 1♂ (Plate 122 figs 5-6), 1♂ (Plate 122 figs 9-10), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂ (Plate 122 figs 7-8), 1♀ (Plate 122 figs 11-12), same locality, 30.XII.2008–02.I.2009; 2♂, same locality and date; 2♂ & 4♀, same locality, 25.I–02.II.2009; 1♂, same locality, 30.I.2009.
Note: De Vos (2002) revised this species together with its relatives which form a distinct subgenus, *Deilemera* Hübner, 1820 ["1816"]. At present this subgenus contains seven species. For the time being, *N. evergista* is divided into four subspecies. This is a rather variable in colour pattern species.
Distribution: It populates New Guinea and surrounding islands from Buru and Seram in the west to New Britain and the D'Entrecasteaux Islands in the east.

Amerila **Walker, 1855**

"*Amerila*." - Walker 1855: 725. Type species: *Sphinx astreus* Drury, 1773, by subsequent designation by Hampson (1900: 60).
= "*Amblythyris Radama*, n. sp." - Mabille 1879: 137. Type species: *Amblythyris radama* Mabille, 1879 [= *Chelonia madagascariensis* Boisduval, 1847], by subsequent designation by Hampson (1900: 60), but as *Aganais vitripennis* Blanchard, 1861 [= *Amblythyris radama* Mabille, 1879].
= "*Phryganeomorpha*. Mihi." - Wallengren 1858: 214. Type species: *Chelonia madagascariensis* Boisduval, 1847, by original designation.
Rhodogastria auct., nec *Rhodogastria* Hübner, 1819 ["1816"].

Note: This is a well-recognized genus which contains from 40 to 50 species (Häuser 1993). Currently only six species are known from the island of New Guinea (De Vos 2013). All of them are present in our collection.
Distribution: This genus inhabits the Afrotropical, Oriental and Australian regions.

Amerila arthusibertrandi **(Guérin-Méneville, 1831)** [4] (Plate 122 figs 13-16)

"*Lithosia Arthus Bertrand*. Guér." - Guérin-Méneville 1831: 284, pl. 19, fig. 5. Type locality: "... d'Offak, dans la Terre des Papous ..." [Indonesia: West Papua, Raja Ampat Islands, Waigeo Island].
= "*C*.[*helonia*] *Saucia*. Boisd." - Boisduval 1832: 214. Type locality: "... à Offack" [= Indonesia: West Papua, Raja Ampat Islands].
= "*Rhodogastria roseibarba*, sp. n." - Druce 1901: 74. Type locality: "Sooloo Islands ..." [= Philippines: Sulu Archipelago].

Material examined: 1♂ (Plate 122 figs 13-14), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I–02.II.2009; 1♂, same locality and date; 1♀, same locality, 30.XII.2008–02.I.2009; 1♀ (Plate 122 figs 15-16), same locality, 25–26.I.2009.
Note: This species superficially is similar to *A.*

3 — According to Opinion 516 of the International Commission on Zoological Nomenclature (ICZN 1958), pp 91-164 and plates CCCXXVII–CCCLXXII of the fourth volume of Cramer's "Uitlandsche Kapellen" were published in 1781, not 1782 as cited by De Vos (2002, 2013).

4 — According to Sherborn & Woodward (1901: 217-319) the 2nd part of the 2nd volume of this work was published on 10 December 1831.

atreus (Drury, 1773) and *A. timolis* (Rithschild, 1914), but can be distinguished from them by the triangular forewing. It is a rather common species.
Distribution: From Sulawesi in the west to the Bismarck Archipelago in the east.

***Amerila astreus* (Drury, 1773)** (Plate 124 figs 1-8)
"*Astreus* ... *Sph*.[*inx*]" - Drury 1773: [91], pl. 28, fig. 4. Type locality: "Bengal" (loc. cit.: 50) [= East India or Bangladesh].
= "*Creatonotos communis*." - Walker 1864: 283. Type locality: "Bourn." [= Indonesia: Maluku Islands, Buru Island].
= "*Rhodogastria astreas* [sic!] *hainana* subspec. nov." - Rothschild 1910: 185. Type locality: "Cheng-May, Hainan, ... Cochin China ..." [= China: Hainan; southern Vietnam].
= *Rhodogastria astreas* [sic!] *curtisi* subspec. nov." - Rothschild 1910: 185. Type locality: "Penang, ..." [= Malaysia: Penang].
= *Rh*.[*odogastria*] *astreus* Drury *druryi* subsp. nov." - Rothschild 1914: 261. Type locality: "Moluccas and Malayan Islands." [= Indonesia: Maluku Islands].
= *Rh*.[*odogastria*] *astreus* Drury *novaeguineae* subsp. nov." - Rothschild 1914: 261. Type locality: "New Guinea." [= New Guinea Island].
= *Rh*.[*odogastria*] *astreus* Drury *dohertyi* subsp. nov." - Rothschild 1914: 261. Type locality: "Island of Bali" [= Indonesia: Bali].
= "*Rhodogastria communis minor* subsp. nov." - Rothschild 1916: 333 Type locality: "Vulcan Island" [= Papua New Guinea: East New Britain Province, Vulcan Island].

Material examined: 2♂, 2♀ (Plate 124 figs 5-8), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂, 1♀, same locality, 27.I.2009; 1♂, same locality, 27–30.I.2009; 1♀, same locality, 31.I.2009; 1♂ (Plate 124 figs 1-2), same locality, 25.I–02.II.2009; 1♀ (Plate 124 figs 3-4), same locality and date.
Note: This species superficially looks like *A. timolis* (Rithschild, 1914), but can be distinguished from it by the somewhat paler coloration of the wings. Besides that, males of *A. timolis* have a round hindwing while in *A. astreus* it is triangular. This seems to be the most common species of the genus.
Distribution: It occurs from India in the west to the islands of Fiji in the east.

***Amerila caudipennis* (Walker, 1864)** (Plate 122 figs 17-18; Plate 123 figs 1-4)
"*Creatonotos caudipennis*." - Walker 1864: 284. Type locality: "Aru" [= Indonesia: Maluku, Aru Islands].

Material examined: 1♂, Indonesia, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, 60 m, 05–07.I.2009; 1♂ (Plate 123 figs 1-2), same locality, 05–16.I.2009; 5♂, same locality and date; 1♂ (Plate 122 figs 17-18), 5♀, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I–02.II.2009; 4♀, same locality, 31.XII.2008; 1♀ (Plate 123 figs 3-4), same locality, 25–26.I.2009; 2♀, same locality and date; 4♀, same locality, 27–30.I.2009.
Note: This species looks very similar to the two previous ones, but differs from them by an elongated anal angle of the hindwing. It is very common species.
Distribution: It is known from New Guinea and surrounding islands ranging from Aru Islands in the southwest to Bismarck Archipelago in the northeast.

***Amerila crokeri* (MacLeay, 1826)** (Plate 123 figs 5-10)
"*Euprepia Crokeri*, (n. s.)" - MacLeay 1826: 465. Type locality: "... at sea, ..." [= Australia (?)].
= "*Amer*.[*ila*] *brachyleuca*, n. sp." - Meyrick 1886: 765. Type locality: "Cooktown, Bowen, and Gayndah, Queensland; ..." [= Australia: Queensland].
= "*Rhodogastria croceri* [sic!] Hampson v. *kajana*" - Bryk 1913: 126. Type locality: "Kai-Innenland" [= Papua New Guinea] (Häuser, 1993).
= "*Rhodogastria crokeri novobritannica* subspec. nov." - Rothschild 1910: 184. Type locality: "New Britain." [=Papua New Guinea: Bismarck Archipelago, New Britain Island].
= "*Rhodogastria crokeri salomonis*" - Rothschild 1910: 184. Type locality: "Solomon Islands: Guadalcanar ...; Florida, ... Isabel, ... Guizo, ...; Tulagi ..." [= Solomon Islands].
= "*Rh*.[*odogastria*] *crokeri* Macleay *bakeri* subsp. nov." - Rothschild 1914: 262. Type locality: "New Guinea." [= Island of New Guinea].

Material examined: 1♂ (Plate 123 figs 7-8), Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂, same locality and date; 1♂ (Plate 123 figs 5-6), same locality, 30.I.2009; 1♂, same locality and date; 1♂, 3♀, same locality, 25.I–02.II.2009; 1♀ (Plate 123 figs 9-10), same locality, 25–26.I.2009; 1♀, same locality and date; 3♀, same locality, 27–30.I.2009; 1♀, same locality, 31.I.2009.
Note: Superficially, this species is very similar to the next species, but it easily differs from it by the

white coloration of the abdomen ventrally. This species is divided at least into four subspecies, of which the subspecies *bakeri* Rothschild, 1914 inhabits New Guinea.
Distribution: This species occurs in the islands of New Guinea, New Britain, northeastern Australia and the Solomon Islands.

***Amerila nigropunctata* (Bethune-Baker, 1908)** (Plate 123 figs 11-16)
"*Rhodogastria nigropunctata* spec. nov."- Bethune-Baker 1908: 191. Type locality: "Ekeikei and all other places where we had collections from" [= Papua New Guinea].

Material examined: 1♂, 1♀, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 31.XII.2008; 1♂ (Plate 123 figs 11-12), same locality, 25.I.2009; 1♂ (Plate 123 figs 15-16), same locality, 25–26.I.2009; 1♂ (Plate 123 figs 13-14), same locality, 30.I.2009.
Note: Habitually, this species looks like the previous species, from which it can be distinguished by the pink-red abdomen ventrally. This seems to be a rather rare species known from a few localities only (De Vos 2013).
Distribution: At present, this species is considered to be an endemic to the island of New Guinea.

***Amerila timolis* (Rothschild, 1914)** (Plate 124 figs 9-18)
"*Rh.*[*odogastria*] *timolis* Trnr." - Rothschild 1914: 262, pl. 25, rows d, e. Type locality: "Queensland (Australia)." [= Australia: Queensland].
= "*Rh.*[*odogastria*] *timolis* Trnr. *papuana* subsp. nov." - Rothschild 1914: 262, pl. 25, row d. Type locality: "New Guinea." [= Island of New Guinea].
= "*Rhodogastria timiolis*, n. sp." - Turner 1915: 20. Type locality: "Kuranda, near Cairns ..., Townsville ..." [= Australia: Queensland, Kuranda, Townsville].
= "*Rhodogastria timolis tenebrosa* subsp. nov." - Rothschild 1916: 333. Type locality: "Vulcan Island" [=Papua New Guinea: East New Britain Province, Vulcan Island].

Material examined: 2♂ (Plate 124 figs 9-12), 5♀, Indonesia, Papua, Genyem env., 02°38'S, 140°10'E, 500 m, 25.I–02.II.2009; 2♀ (Plate 124 figs 15-18), same locality and date; 2♀, same locality, 30.XII.2008–02.I.2009; 1♀ (Plate 124 figs 13-14), same locality, 25–26.I.2009; 2♀, same locality and date; 1♀, same locality, 27.I.2009; 4♀, same locality, 27–30.I.2009; 1♀, Indonesia, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, 300 m, 04–06.II.2009.
Note: Superficially, this species is similar to *A. arthusibertrandi* (Guérin-Méneville, 1831) and *A. atreus* (Drury, 1773), but it can be distinguished by both the coloration and shape of the hindwing. This species is divided into two subspecies, of which the subspecies *papuana* Rothschild populates the island of New Guinea.
Distribution: It is known from Papua New Guinea and Queensland, Australia.

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First record of *Cyrtodactylus papuensis* (Brongersma, 1934) (Reptilia: Geckonidae) outside mainland New Guinea

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Abstract: A new record of *Cyrtodactylus papuensis* from Misool Island (Raja Ampat Islands) is discussed.

Key words: Reptilia, *Cyrtodactylus papuensis*, Indonesian New Guinea.

On 27.03.2009, the third author, together with Kristine Greķe spotted three remarkable geckos nearby an insect light trapping system in primary rainforest on Misool Island, Raja Ampat Archipelago (East Indonesia) (Plate 125, map 1). Two of the observed specimens were collected, alcohol-fixed, and given to the collection of the Naturkundemuseum Erfurt, Germany under the number NME R 774/13. Exact locality for specimens: Indonesia E, Raja Ampat Archipelago, Misool Is. SW, distr. Misool Utara, Aduwey vill. ~4 km NW, valley of River Hakau, 1°58'46"S, 129°54'37"E, 27.III.2009, primary lowland rainforest.

During taxonomic studies on the museum's collection, the two Misool specimens were identified as *Cyrtodactylus papuensis* (Brongersma, 1934) (Rösler, Scheidt 2013). They are similar to *Cyrtodactylus marmoratus* (Gray, 1831), but exhibit the following diagnostic features: lateral fold with conical tubercle, more than 50 ventrals between lateral folds, narrow pre-cloacal pit and large pre-cloacal scales separated from enlarged femoral scales by tiny intermedial scales (Brongersma 1928, 1934; Gray 1831; Kraus 2008; Rösler et al. 2007). The discovery of this species on Misool Island represents the first record of *Cyrtodactylus papuensis* outside the mainland of New Guinea Island, where this species is widely distributed in the western part (Bauer 1994; Loveridge 1948; Rösler et al. 2005).

The observation site situated in the southern part of Misool Island, in the valley of the small river Hakau, about 4 km northwest of Aduway village (often cited as Adua on older maps) and about 3.5-4.5 km straight line direction North from the coast of Seram Sea (Laut Seram), at the foot of a ridge (maximum height about 400 m) directed west-east. Whereas most formations on Misool Island are calciphilous or karst formations, this ridge is formed of basalt.

The observation site (Plate 126) is located in primary riverine lowland rainforest, which is affected by high water flow from the ridge. In the collection area, sparsely situated trees allow ample sun exposure, supporting growth of bushes and lianas among the trees. So, although this riverine rainforest somewhat resembles secondary (selectively logged) forest, it is in fact, primary. This spot in a riverine is generally lighter and warmer than surrounded closed-canopy rainforest.

Specimens were observed at nighttime, about 20:00 local time on shrubs, about 1-1.5 m above ground level. They were not very agile and were easily grasped by hands. Daytime temperatures at the site were~29-35°C, but dropped at nighttime, to 23-25°C.

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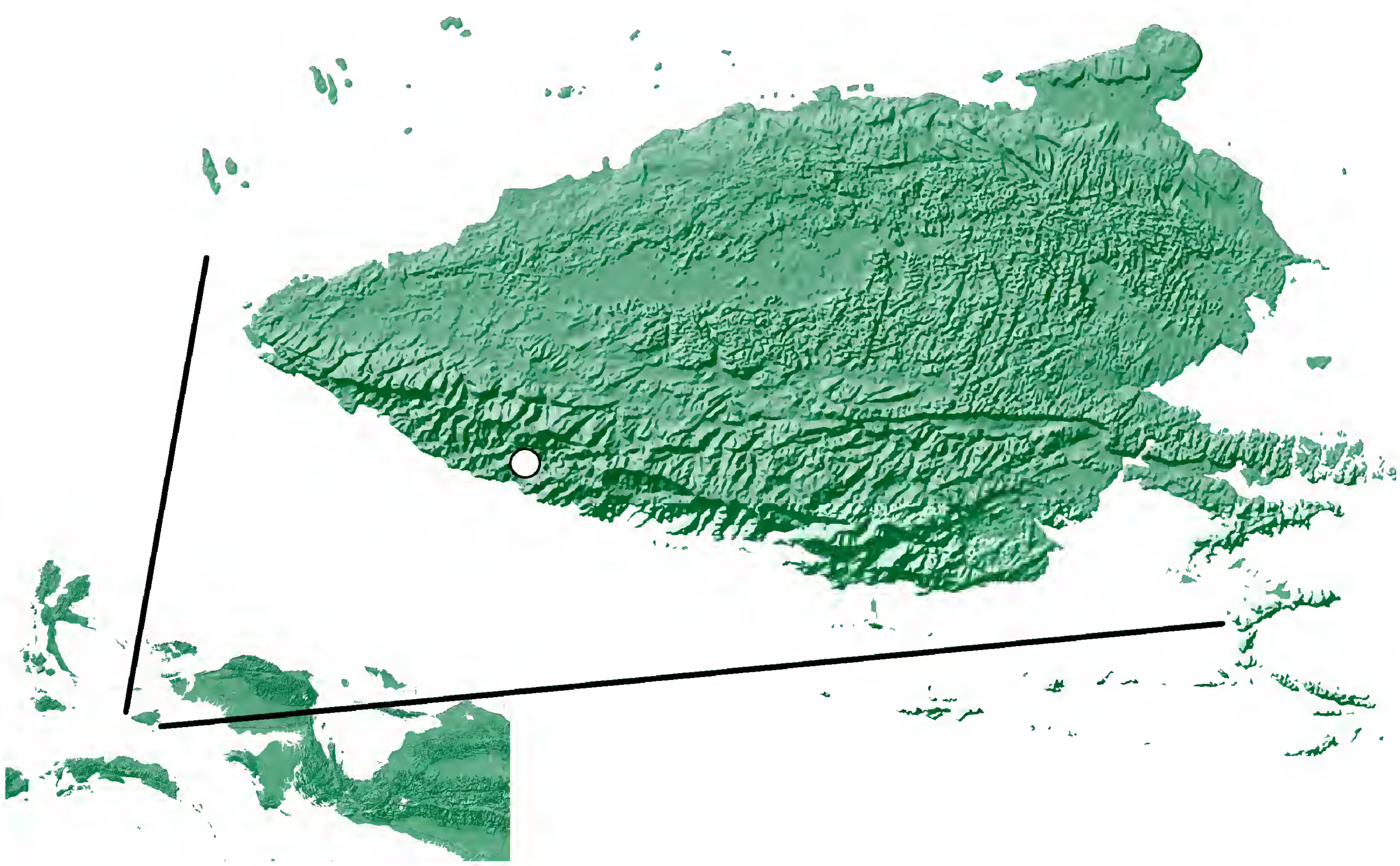

Map 1. Collecting locality of *Cyrtodactylus papuensis* (Brongersma, 1934) on Misool Island, eastern Indonesia (prepared with ArcGIS 9 software).

Index to scientific names

New taxa described and nomenclatural acts made in this volume are in bold type face, group names higher than genus level, as well as synonyms are in normal type face. Taxa at generic level and lower are *italicised*.

RICHARDS, S.J., OLIVER, P., BROWN, R.M.: A new scansorial species of *Platymantis* (Anura: Ceratobatrachidae) ...

Figure 1. Adult male (unvouchered) *Platymantis custos* sp. nov. in life, guarding eggs on a leaf in the forest (photo: S.J. Richards).

Plate 2

Brock, P.D.: A new species of leaf insect (Phasmida: Phylliidae) from West Papua, Indonesia

Figure 1. Tamarau Mountains, West Papua, Indonesia at sampling site of the holotype *Phyllium (Phyllium) telnovi* sp. nov. (photo: D. Telnov).

Figure 2. *Phyllium (Phyllium) telnovi* sp. nov., holotype male: dorsal view.

Plate 3

Brock, P.D.: A new species of leaf insect (Phasmida: Phylliidae) from West Papua, Indonesia

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Figures 1-3. *Phyllium (Phyllium) telnovi* sp. nov., holotype male. 1 – Right fore leg; 2 – End of abdomen, dorsal view; 3 – End of abdomen, ventral view.

Figure 4. *Phyllium (Phyllium) telnovi* sp. nov., holotype male: head and thorax, dorsal view.

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Figures 1-4. 1 – *Silvattia perplexa* sp. nov., holotype, habitus, lateral view; 2 – *Silvattia petarberoni* sp. nov., holotype, habitus, dorsolateral view; 3-4: *Silvattia jeekeli* sp. nov. 3 – Paratype ♂ from Tifalmin, habitus, lateral view; 4 – Paratype ♂ from Finim Tel Plateau, midbody segments, dorsal view.

Plate 5

GORBUNOV, O.G., ZAMESOV, A.N.: Snouted tiger moths (Lepidoptera: Aganaidae) of Papua Province, Indonesia …

Figures 1-6. The places of night traps. 1 – Indonesia, W New Guinea, Papua, Sentani env., Cyclops Mts., 02°32'S, 140°28'E, ca. 300 m a.s.l., 28.XII.2008; 2 – Same place, 24.XII.2008; 3 – Indonesia, W New Guinea, Papua, Genyem env., 02°38'S, 140°10'E, ca 500 m a.s.l., 28.I.2009; 4 – Same place, 29.I.2009; 5 – Indonesia, W New Guinea, Papua, Taritatu riv., SE from Dabra, 03°15'S, 138°34'E, ca. 60 m a.s.l., 06.I.2009; 6 – Same place, 15.I.2009 (photo: A. Zamesov).

Plate 6

Figures 1-10. Habitus of Papuan Aganaidae. 1-2: *Agape chloropyga* (Walker, 1854); 1 – ♂, Papua, Genyem env.; 2 – ditto, underside; 3-4: *Neochera dominia* Cramer, 1780; 3 – ♀, Papua, Genyem env.; 4 – ditto, underside; 5-6: *Asota australis* (Boisduval, 1832); 5 – ♂, Papua, Genyem env.; 6 – ditto, underside; 7-10: *Asota eusemioides* (Felder, 1875); 7 – ♂, Papua, Genyem env.; 8 – ditto, underside; 9 – ♀, same locality; 10: ditto, underside [scale bar 10 mm].

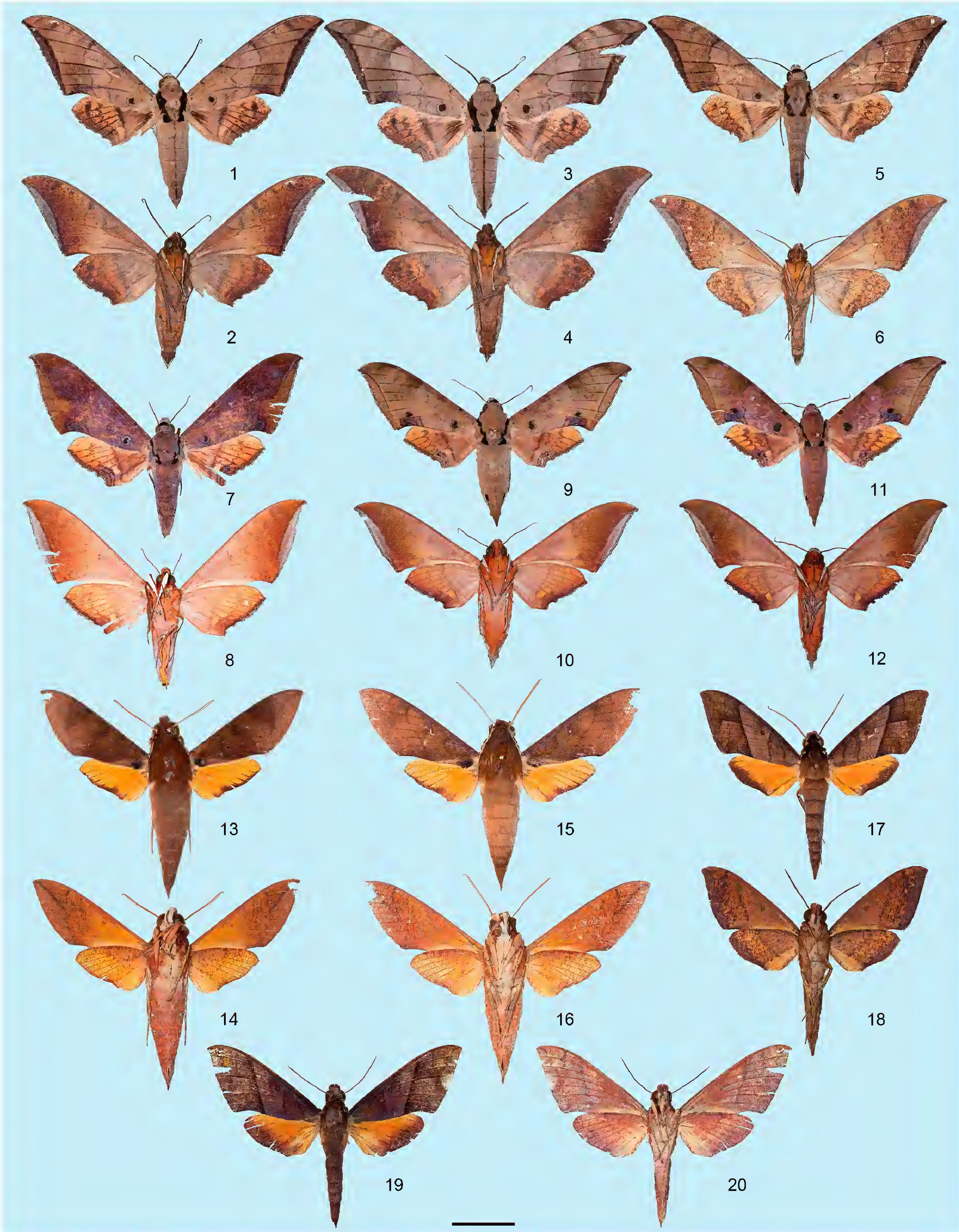
Plate 7

Figures 1-10. Habitus of Papuan Aganaidae. 1-2: *Asota caricae* (Fabricius, 1775); 1 – ♂, Papua, Sentani env., Cyclops Mts.; 2 – ditto, underside; 3-6: *Asota heliconia* (Linnaeus, 1758); 3 – ♂, Papua, Genyem env.; 4 – ditto, underside; 5 – ♀, Papua, Sentani env., Cyclops Mts.; 6 – ditto, underside; 7-8: *Asota plana* (Walker, 1854); 7 – ♀, Papua, Genyem env.; 8 – ditto, underside; 9-10: *Asota strigosa* (Boisduval, 1832); 9 – ♂, Papua, Genyem env.; 10 – ditto, underside [scale bar 10 mm].

Plate 8

Figures 1-14. Habitus of Papuan Sphingidae. 1-2: *Acherontia lachesis* (Fabricius, 1798); 1 – ♂, Papua, Genyem env.; 2 – ditto, underside; 3-6: *Agrius convolvuli* (Linnaeus, 1758); 3 – ♂, Papua, Taritatu riv., SE from Dabra; 4 – ditto, underside; 5 – ♀, Papua, Genyem env.; 6 – ditto, underside; 7-8: *Agrius luctifera* (Walker, 1864); 7 – ♀, Papua, Sentani env., Cyclops Mts.; 8 – ditto, underside; 9-10: *Megacorma obliqua* (Walker, 1856); 9 – ♂, Papua, Genyem env.; 10 – ditto, underside; 11-14: *Meganoton rubescens* (Butler, 1875); 11 – ♂, Papua, Taritatu riv., SE from Dabra; 12 – ditto, underside; 13 – ♀, Papua, Genyem env.; 14 – ditto, underside [scale bar 20 mm].

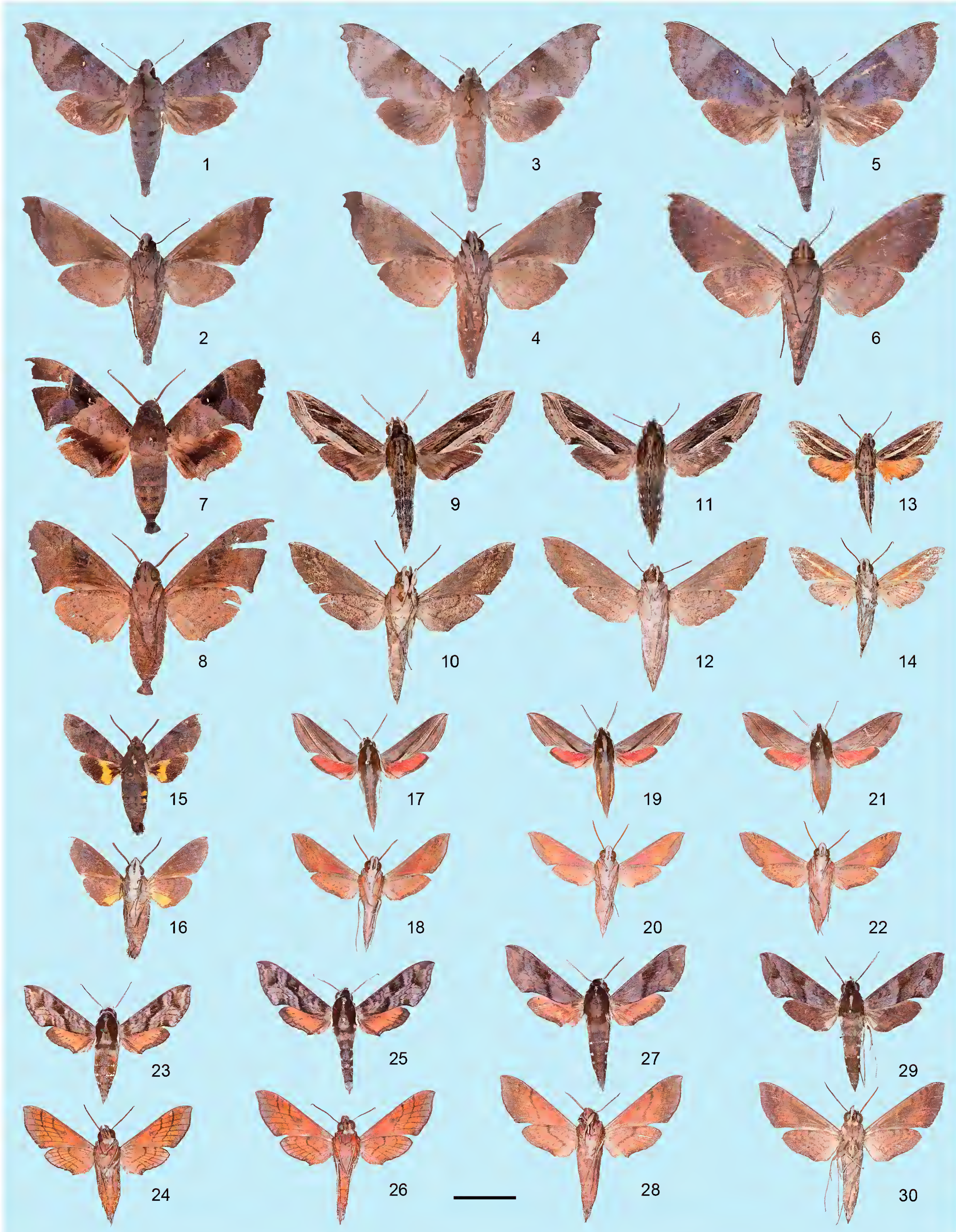
Figures 1-18. Habitus of Papuan Sphingidae. 1-6: *Psilogramma mastrigti* Eitschberger, 2001; 1 – ♂, Papua, Taritatu riv., SE from Dabra; 2 – ditto, underside; 3 – ♂, Papua, Genyem env.; 4 – ditto, underside; 5 – ♀, same locality; 6 – ditto, underside; 7-10: *Psilogramma wernerwolfi* Eitschberger, 2001; 7 – ♂, Papua, Genyem env.; 8 – ditto, underside; 9 – ♀, same locality; 10 – ditto, underside; 11-18: *Psilogramma anne* Eitschberger, 2001; 11 – ♂, Papua, Taritatu riv., SE from Dabra; 12 – ditto, underside; 13 – ♂, Papua, Genyem env.; 14 – ditto, underside; 15 – ♀, same locality; 16 – ditto, underside; 17 – ♀, same locality; 18 – ditto, underside [scale bar 20 mm].



Figures 1-20. Habitus of Papuan Sphingidae. 1-6: *Ambulyx wildei* Miskin, 1891; 1 – ♂, Papua, Genyem env.; 2 – ditto, underside; 3 – ♂, Papua, Taritatu riv., SE from Dabra; 4 – ditto, underside; 5 – ♂, same locality; 6 – ditto, underside; 7-8: *Ambulyx phalaris* (Jordan, 1919); 7 – ♀, Papua, Genyem env.; 8 – ditto, underside; 9-12: *Ambulyx dohertyi* Rothschild, 1894; 9 – ♂, Papua, Genyem env.; 10 – ditto, underside; 11 – ♂, same locality; 12 – ditto, underside; 13-16: *Gnathothlibus eras* (Boisduval, 1832); 13 – ♂, Papua, Genyem env.; 14 – ditto, underside; 15 – ♂, Papua, Taritatu riv., SE from Dabra; 16 – ditto, underside; 17-20: *Gnathothlibus heliodes* (Meyrick, 1889); 17 – ♂, Papua, Taritatu riv., SE from Dabra; 18 – ditto, underside; 19 – ♂, same locality; 20 – ditto, underside [scale bar 20 mm].

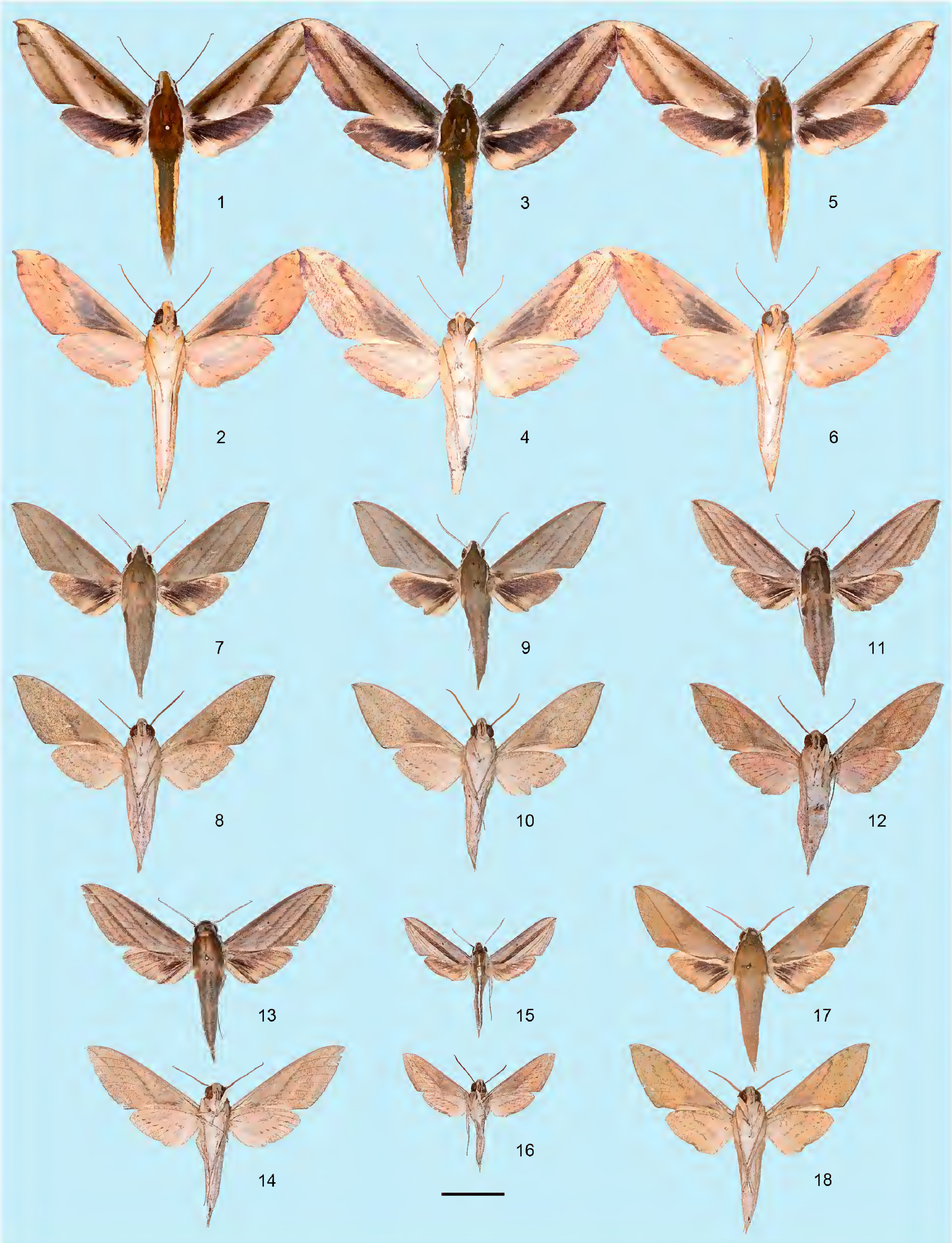
Plate 11

Figures 1-20. Habitus of Papuan Sphingidae. 1-2: *Daphnis moorei* (W.J. MacLeay, 1866); 1 – ♂, Papua, Sentani env., Cyclops Mts.; 2 – ditto, underside; 3-4: *Daphnis hypothous* (Cramer, 1780); 3 – ♂, Malaysia, Borneo Is., Sabah Province, Trusmadi Mt., 1600 m, 01-10.V.2008, leg. A. Gorodinski; 4 – ditto, underside; 5-8: *Daphnis dohertyi* Rothschild, 1897; 5 – ♂, Papua, Genyem env.; 6 – ditto, underside; 7 – ♂, same locality; 8 – ditto, underside; 9-10: *Daphnis protrudens* R. Felder, 1875; 9 – ♂, Papua, Genyem env.; 10 – ditto, underside; 11-20: *Acosmeryx anceus* (Stoll, 1781); 11 – ♂, Papua, Genyem env.; 12 – ditto, underside; 13 – ♂, same locality; 14 – ditto, underside; 15 – ♂, Papua, Sentani env., Cyclops Mts.; 16 – ditto, underside; 17 – ♀, Papua, Genyem env.; 18 – ditto, underside; 19 – ♀, Papua, Taritatu riv., SE from Dabra; 20 – ditto, underside [scale bar 20 mm].



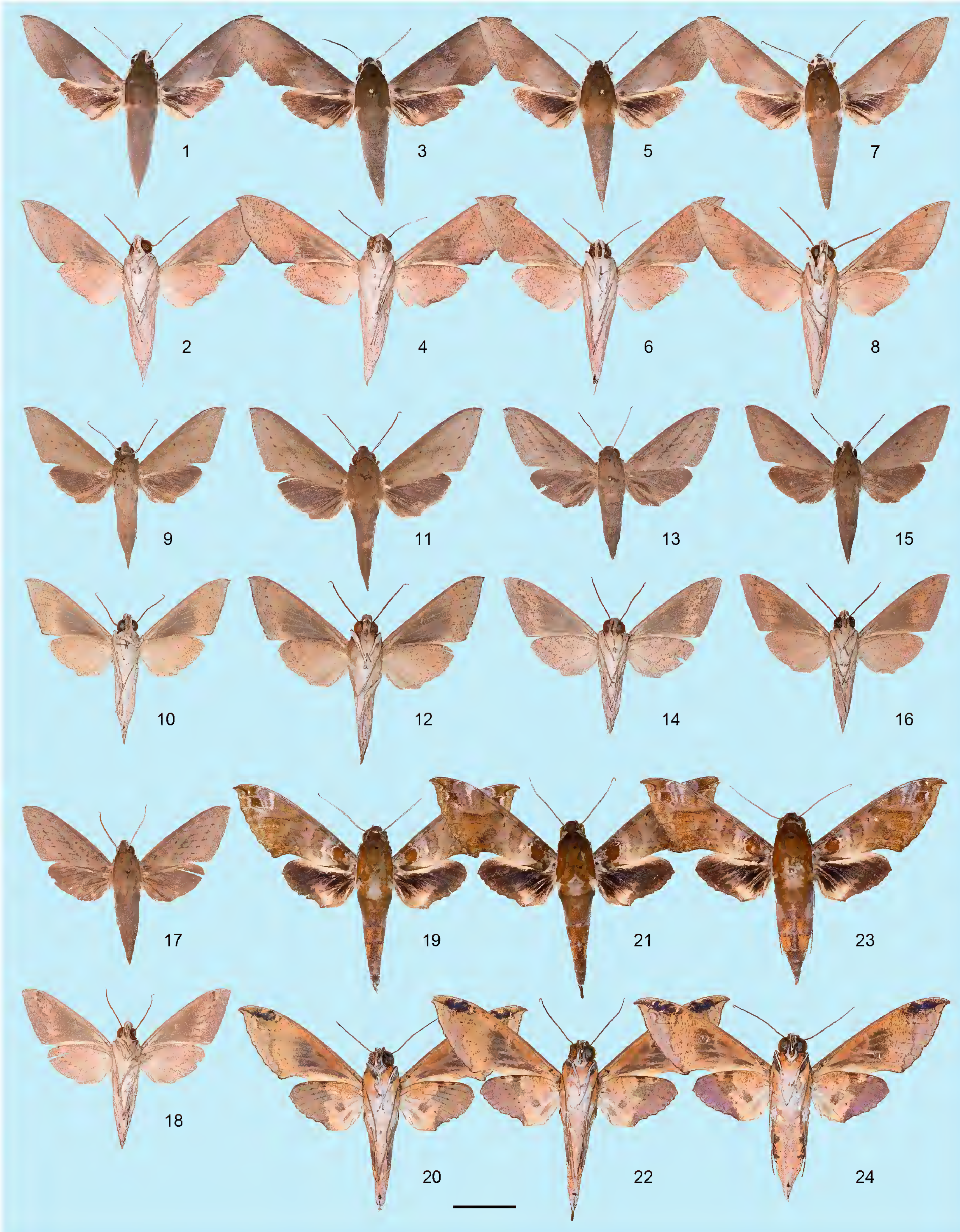
Figures 1-30. Habitus of Papuan Sphingidae. 1-6: *Acosmeryx miskinoides* Vaglia, Haxaire, 2007; 1 – ♂, Papua, Taritatu riv., SE from Dabra; 2 – ditto, underside; 3 – ♂, same locality; 4 – ditto, underside; 5 – ♀, same locality; 6 – ditto, underside; 7-8: *Eurypteryx falcata* Gehlen, 1922; 7 – ♂, Papua, Genyem env.; 8 – ditto, underside; 9-12: *Hippotion velox* (Fabricius, 1793); 9 – ♂, Papua, Genyem env.; 10 – ditto, underside; 11 – ♀, same locality; 12 – ditto, underside; 13-14: *Eupanacra micholitzi* (Rothschild, Jordan, 1893); 13 – ♂, Papua, Taritatu riv., SE from Dabra; 14 – ditto, underside; 15-16: *Macroglossum nubilum* Rothschild, Jordan, 1903; 15 – ♂, Papua, Taritatu riv., SE from Dabra; 16 – ditto, underside; 17-22: *Hippotion boerhaviae* (Fabricius, 1775); 17 – ♂, Papua, Sentani env., Cyclops Mts.; 18 – ditto, underside; 19 – ♂, same locality; 20 – ditto, underside; 21 – ♀, Papua, Sentani env., Cyclops Mts.; 22 – ditto, underside; 23-30: *Hippotion brennus* (Stoll, 1782); 23 – ♂, Papua, Sentani env., Cyclops Mts.; 24 – ditto, underside; 25 – ♂, same locality; 26 – ditto, underside; 27 – ♂, Papua, Genyem env.; 28 – ditto, underside; 29 – ♂, Papua, Taritatu riv., SE from Dabra; 30 – ditto, underside [scale bar 20 mm].

Plate 13



Figures 1-18. Habitus of Papuan Sphingidae. 1-6: *Theretra nessus* (Drury, 1773); 1 – ♂, Papua, Taritatu riv., SE from Dabra; 2 – ditto, underside; 3 – ♀, Papua, Genyem env.; 4 – ditto, underside; 5 – ♀, same locality; 6 – ditto, underside; 7-10: *Theretra insularis* (Swinhoe, 1892); 7 – ♂, Papua, Sentani env., Cyclops Mts.; 8 – ditto, underside; 9 – ♂, same locality; 10 – ditto, underside; 11-14: *Theretra radiosa* Rothschild, Jordan, 1916; 11 – ♂, Papua, Genyem env.; 12 – ditto, underside; 13 – ♂, same locality; 14 – ditto, underside; 15-16: *Theretra silhetensis* (Walker, 1856); 15 – ♂, Papua, Sentani env., Cyclops Mts.; 16 – ditto, underside; 17-18: *Theretra celata* (Butler, 1877); 17 – ♂, Papua, Genyem env.; 18 – ditto, underside [scale bar 20 mm].

Plate 14



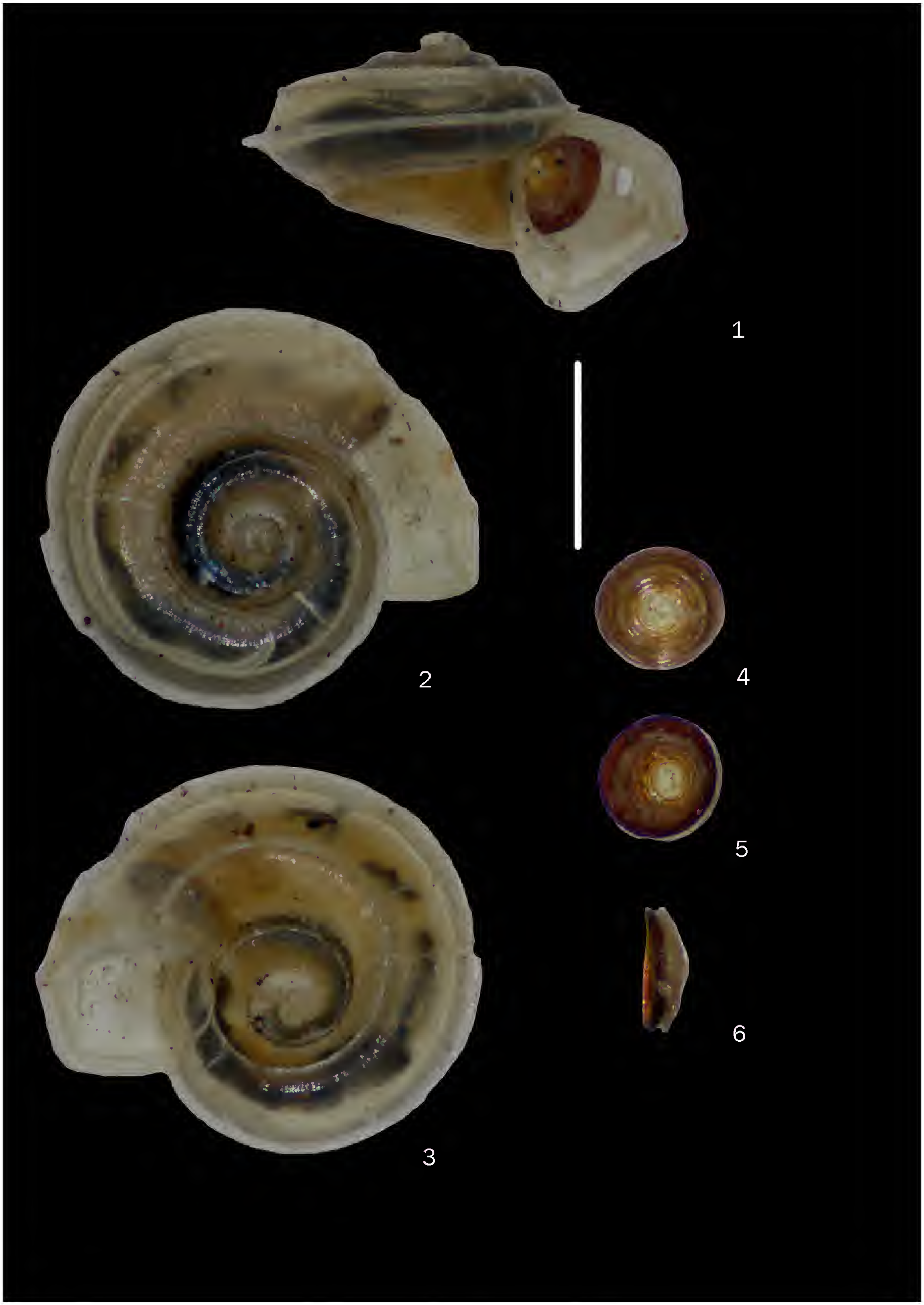
Figures 1-24. Habitus of Papuan Sphingidae. 1-4: *Theretra indistincta* (Butler, 1877); 1 – ♂, Papua, Sentani env., Cyclops Mts.; 2 – ditto, underside; 3 – ♀, Papua, Genyem env.; 4 – ditto, underside; 5-8: *Theretra tabubilensis* Lachlan, 2009; 5 – ♂, Papua, Genyem env.; 6 – ditto, underside; 7 – ♂, same locality; 8 – ditto, underside; 9-12: *Theretra latreillii* (W.S. Macleay, 1826 ["1827"]); 9 – ♂, Papua, Sentani env., Cyclops Mts.; 10 – ditto, underside; 11 – ♀, Papua, Taritatu riv., SE from Dabra; 12 – ditto, underside; 13-18: *Theretra tryoni* (Miskin, 1891); 13 – ♂, Papua, Sentani env., Cyclops Mts.; 14 – ditto, underside; 15 – same locality; 16 – ditto, underside; 17 – ♀, Papua, Taritatu riv., SE from Dabra; 18 – ditto, underside; 19-24: *Cechenena helops* (Walker, 1856); 19 – ♂, Papua, Taritatu riv., SE from Dabra; 20 – ditto, underside; 21 – ♂, Papua, Genyem env.; 22 – ditto, underside; 23 – ♀, same locality; 24 – ditto, underside [scale bar 20 mm].

Figures 1-6. *Ditropopsis alta* sp. nov., holotype. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figures 1-6. *Ditropopsis halmaherica* sp. nov. 1-3: Shell in different positions, holotype; 4-6: Operculum, paratype. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

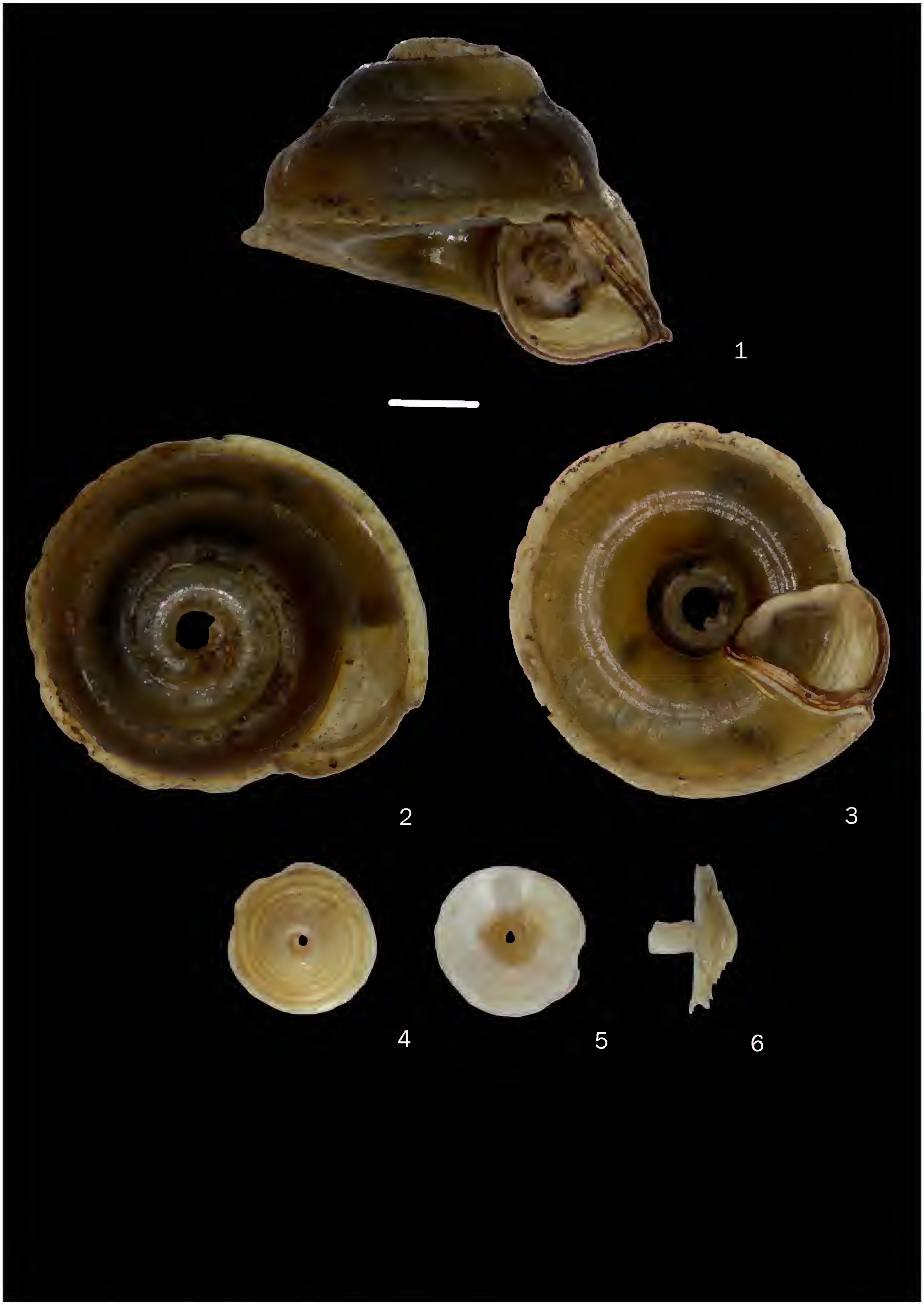
Figures 1-6. Papuan *Ditropopsis*. 1-3: *Ditropopsis ingenua* (O. Boettger, 1891), lectotype, shell in different positions; 4-6: *Ditropopsis majalibit* sp. nov., holotype, shell in different positions [scale bar 10 mm].

Figures 1-6. *Ditropopsis magna* sp. nov., holotype. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

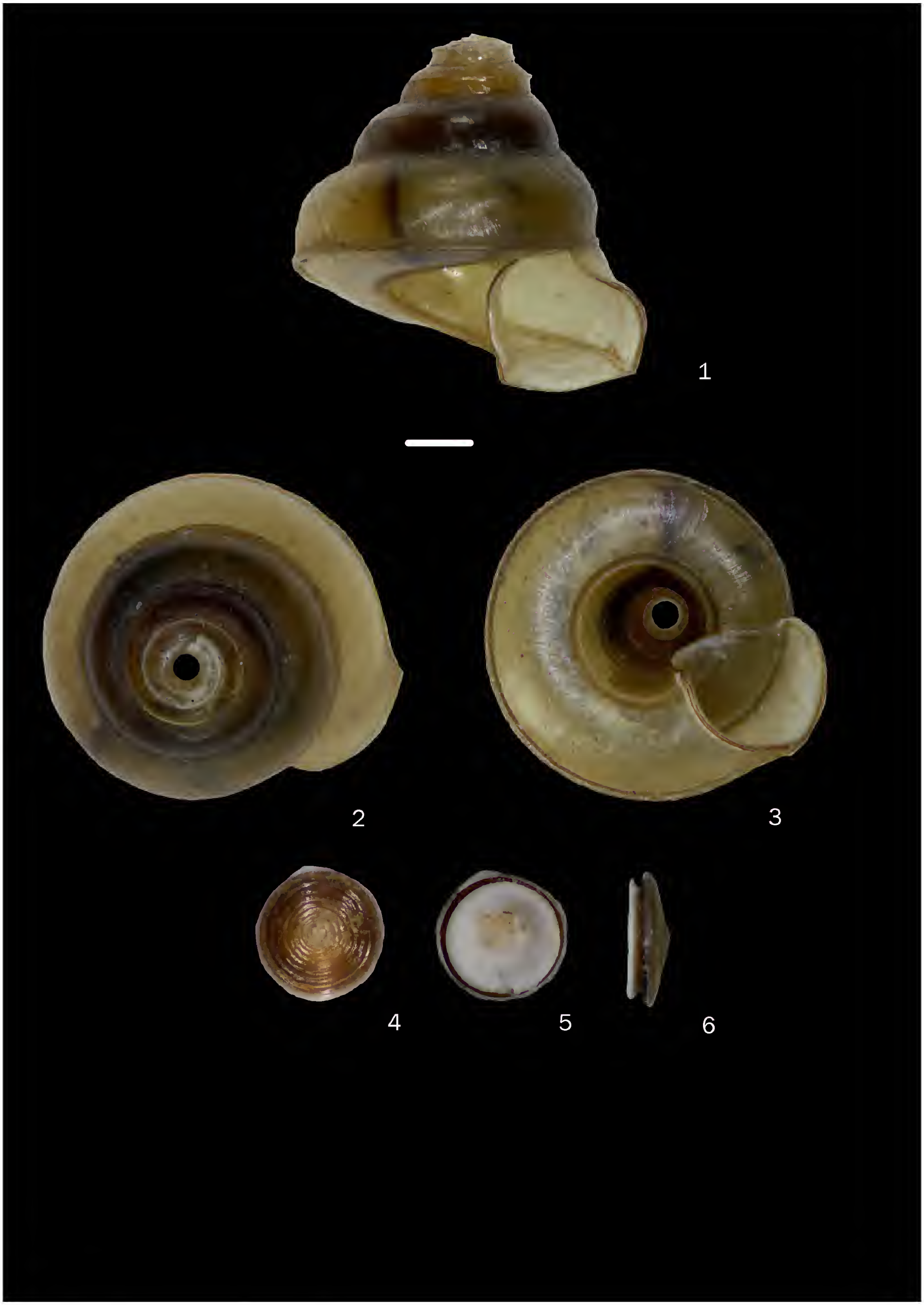


Figures 1-6. *Ditropopsis moellendorffi* (O. Boettger, 1891), specimen from Central Seram. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figures 1-7. *Ditropopsis monticola* sp. nov., holotype. 1-4: Shell in different positions; 5-7: Operculum. 5 – Internally; 6 – Externally; 7 – Laterally [scale bar 1 mm].



Figures 1-6. *Ditropopsis pallidioperculata* sp. nov. 1-3: Shell in different positions, holotype; 4-6: Operculum, paratype. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].



Figures 1-6. *Ditropopsis pyramis* sp. nov., holotype. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Plate 23

GREĶE, K.: Species of *Ditropopsis* E.A. Smith, 1897 (Architaenioglossa: Cyclophoridae) from the Papuan region ...

Figures 1-7. *Ditropopsis tamarau* sp. nov., holotype. 1-3: Shell in different positions; 4-7: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally; 7 – Laterally, different angle [scale bar 1 mm].

Figures 1-6. *Ditropopsis telnovi* sp. nov., holotype. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figures 1-6. *Ditropopsis unicarinata* sp. nov. 1-3: Shell in different positions, holotype; 4-6: Operculum, paratype. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figures 1-6. *Ditropopsis waigeoensis* sp. nov., holotype. 1-3: Shell in different positions; 4-6: Operculum. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figures 1-6. *Ditropopsis wallacei* sp. nov. 1-3: Shell in different positions, holotype; 4-6: Operculum, paratype. 4 – Internally; 5 – Externally; 6 – Laterally [scale bar 1 mm].

Figure 1. Riverine lowland rainforest in Central Seram, locality for *Ditropopsis moellendorffi* (O. Boettger, 1891) (photo: D. Telnov).

Figure 2. Lowland and lower montane rainforests in Tamarau Mts., New Guinea, locality for *Ditropopsis monticola* sp. nov. and *D. tamarau* sp. nov. (photo: D. Telnov).

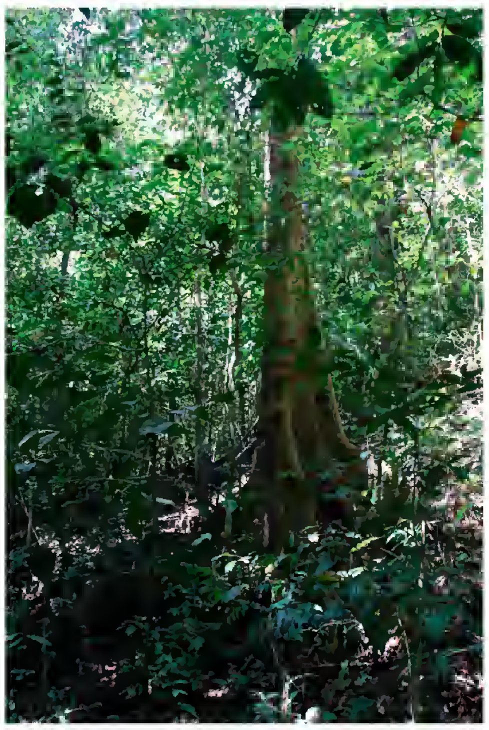


Figure 3. River Biga valley, Misool, locality for *D. magna* sp. nov. (photo: D. Telnov).

Figure 4. Moreala stream N of Weda, Central Halmahera, locality for *D. halmaherica* sp. nov. (photo: D. Telnov).

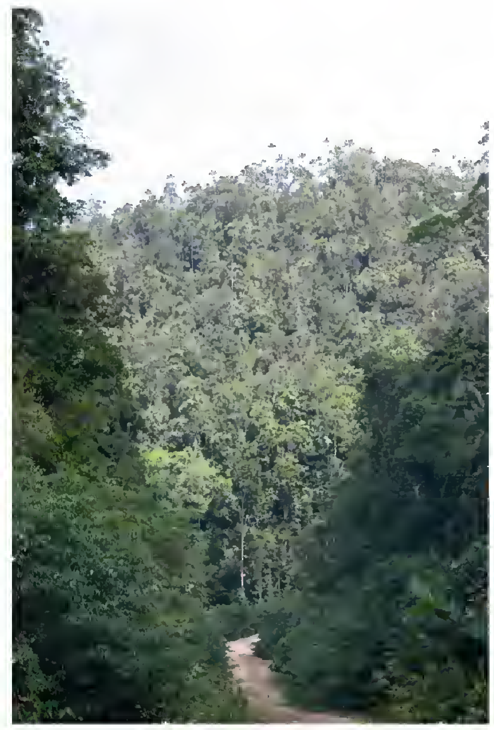
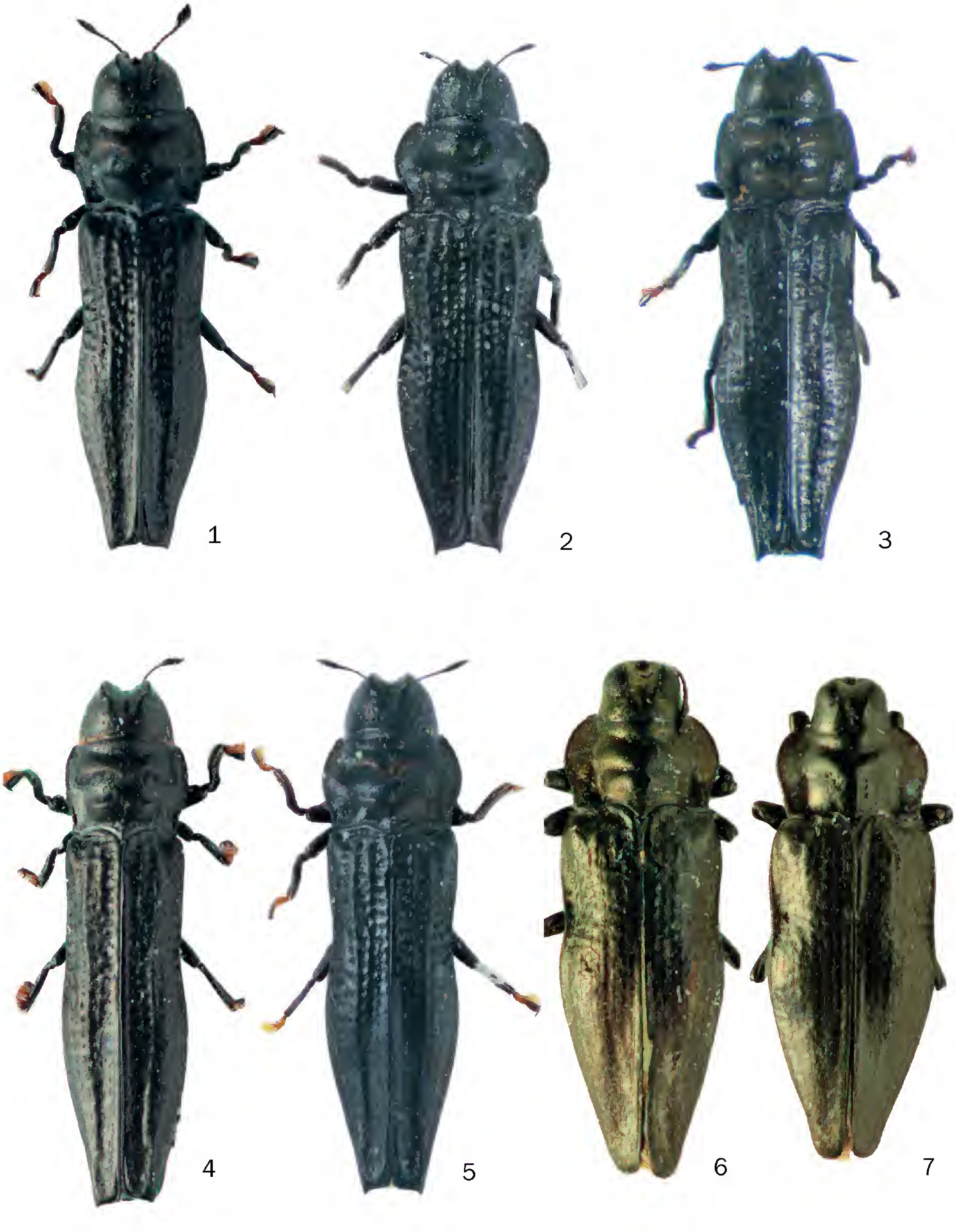


Figure 5. Western Waigeo, locality for *D. telnovi* sp. nov. and *D. unicainata* sp. nov. (photo: D. Telnov).

Figure 6. River Werabiai valley, Waigeo, locality for *Ditropopsis majalibit* sp. nov. and *D. wallacei* sp. nov. (photo: D. Telnov).

Figure 7. Riverine secondary lowland rainforest NE of Sorong, Bird's Head Peninsula of New Guinea, locality for *Ditropopsis pallidioperculata* sp. nov. (photo: D. Telnov).

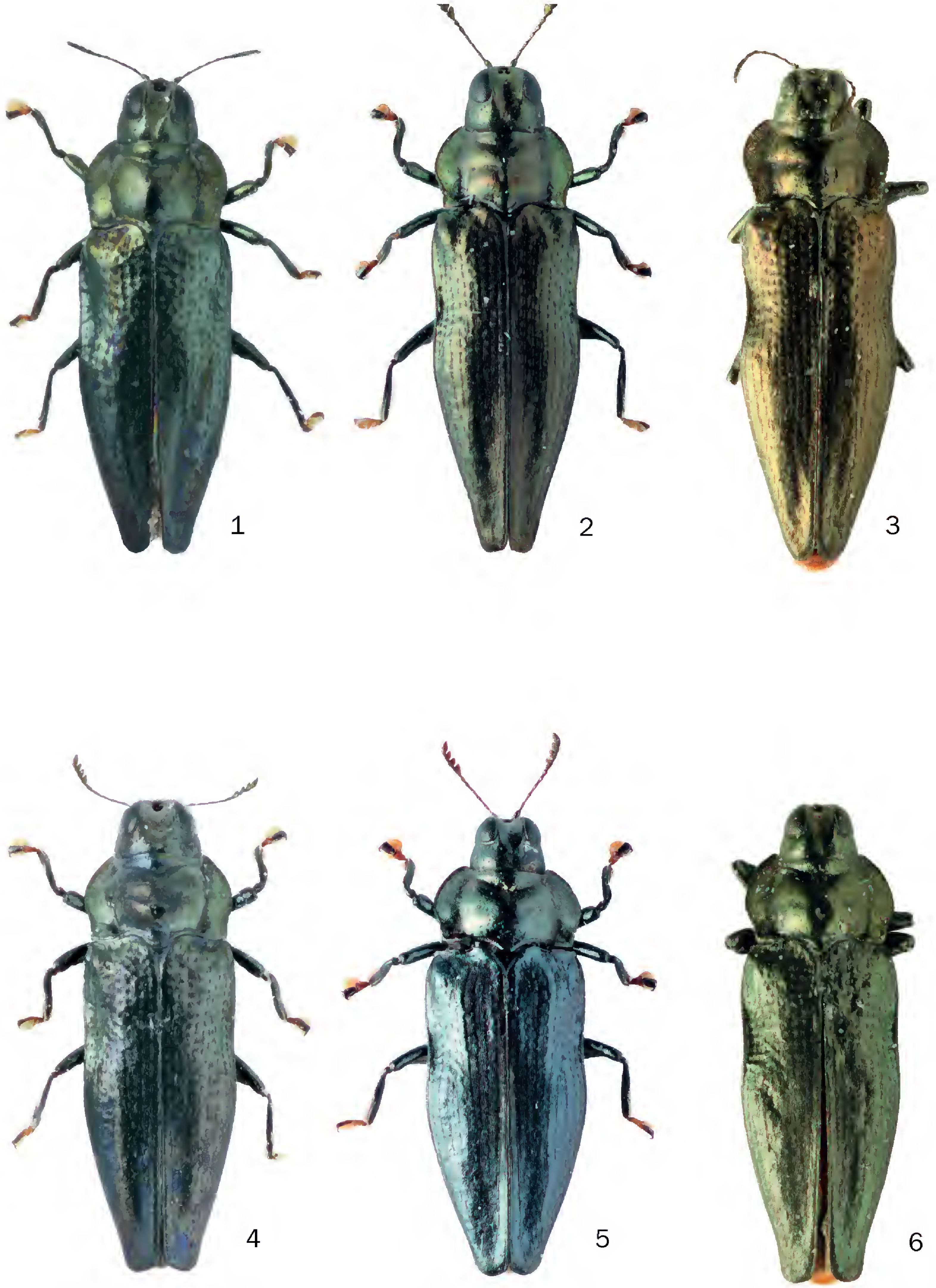
Plate 29



Figures 1-7. Habitus of *Aphanisticus* spp., dorsal view. 1 – *A. kolibaci* Kalashian, 1999 (holotype VKCB, photo: V. Kubáň); 2 – *A. australasiae* sp. nov. (holotype BMNH, photo: K. Makarov); 3 – *A. denticauda* Kalashian, 1993 (holotype ZIN, photo: M. Volkovitsh); 4 – *A. bolmi* Kalashian, 2004 (holotype VKCB, photo: V. Kubáň); 5 – *A. queenslandicus* sp. nov. (holotype BMNH, photo: K. Makarov); 6 – *A. apayaoi* Obenberger, 1928 (lectotype NMPC, photo: V. Kubáň); 7 – *A. brevior* Obenberger, 1928 (lectotype NMPC, photo: V. Kubáň).

Plate 30

KALASHIAN, M.YU., KUBÁŇ, V.: New species of *Aphanisticus* Latreille, 1810 (Coleoptera: Buprestidae) ...



Figures 1-6. Habitus of *Aphanisticus* spp., dorsal view. 1 – *A. barclayi* sp. nov. (holotype BMNH, photo: K. Makarov); 2 – *A. pseudochloris* Kalashian, 2003 (holotype VKCB, photo: V. Kubáň); 3 – *A. chloris* Obenberger, 1928 (lectotype NMPC, photo: V. Kubáň); 4 – *A. sulawesicus* sp. nov. (holotype BMNH, photo: K. Makarov); 5 – *A. microcephalus* Kalashian, 2003 (holotype VKCB, photo: V. Kubáň); 6 – *A. limayicus* Obenberger, 1928 (lectotype NMPC, photo: V. Kubáň).

1

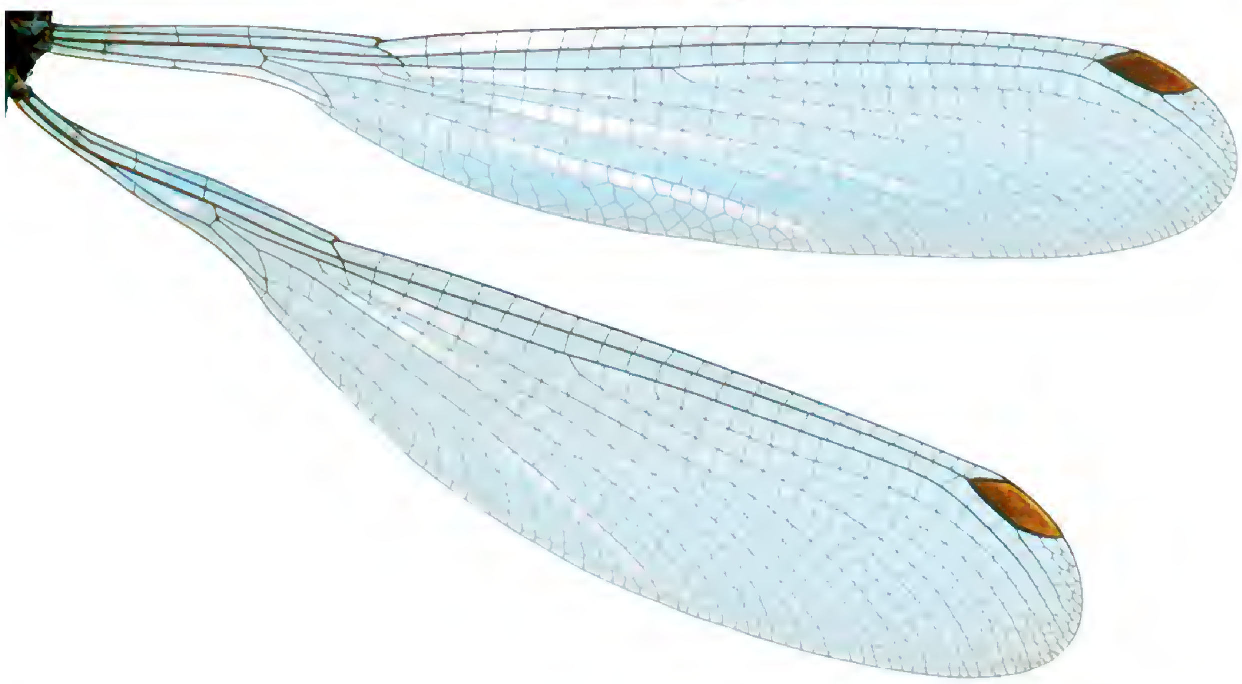
2 3

Figures 1-3. *Argiolestes zane* sp. nov. 1 – Holotype in its natural environment in Triton Bay near Lobo village, prior being catched (photo: M. Kalniņš); 2 – Head, frontal view (holotype); 3 – Head, frontal view (paratype); this paratypic specimen partly lost its blue coloration, especially along the eyes margins).

Plate 32

Kalniņš, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)

1



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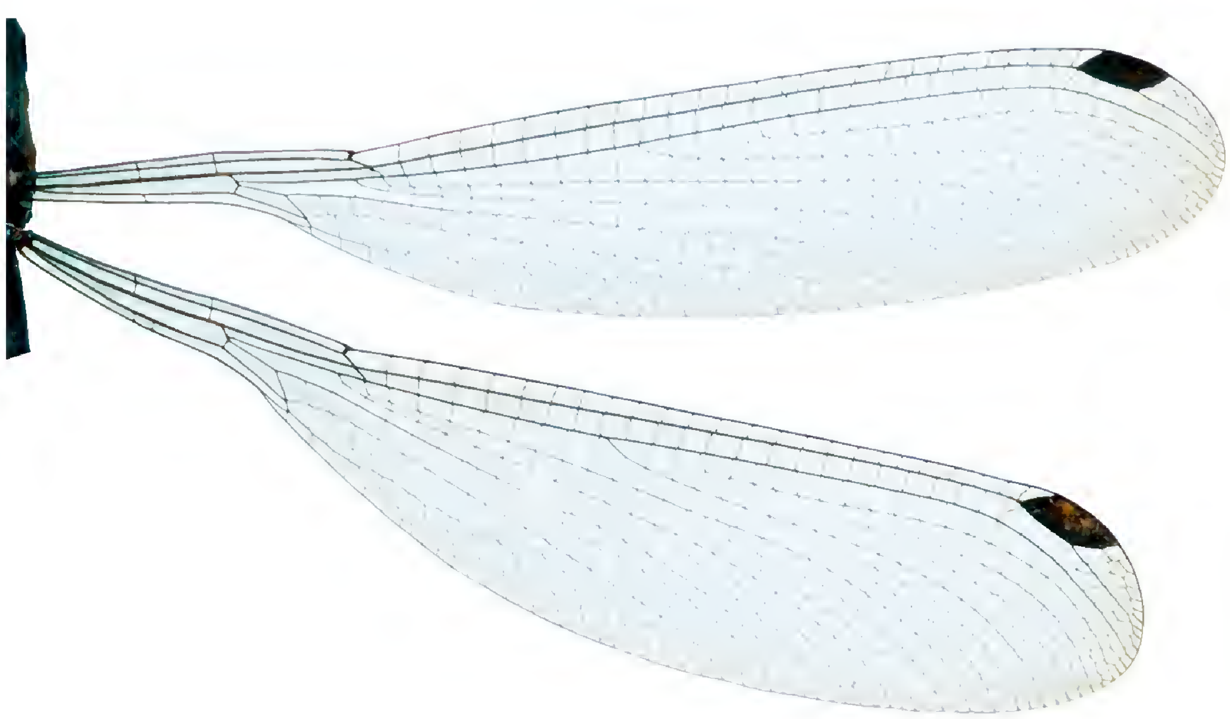


3

Figures 1-3. *Argiolestes zane* sp. nov. 1 – Thorax, lateral view (specimen in the collection already lost its blue coloration); 2 – Right wings, dorsal view (holotype); 3 – Right wings, dorsal view (paratype).

Plate 33

Kalniņš, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)

1

2

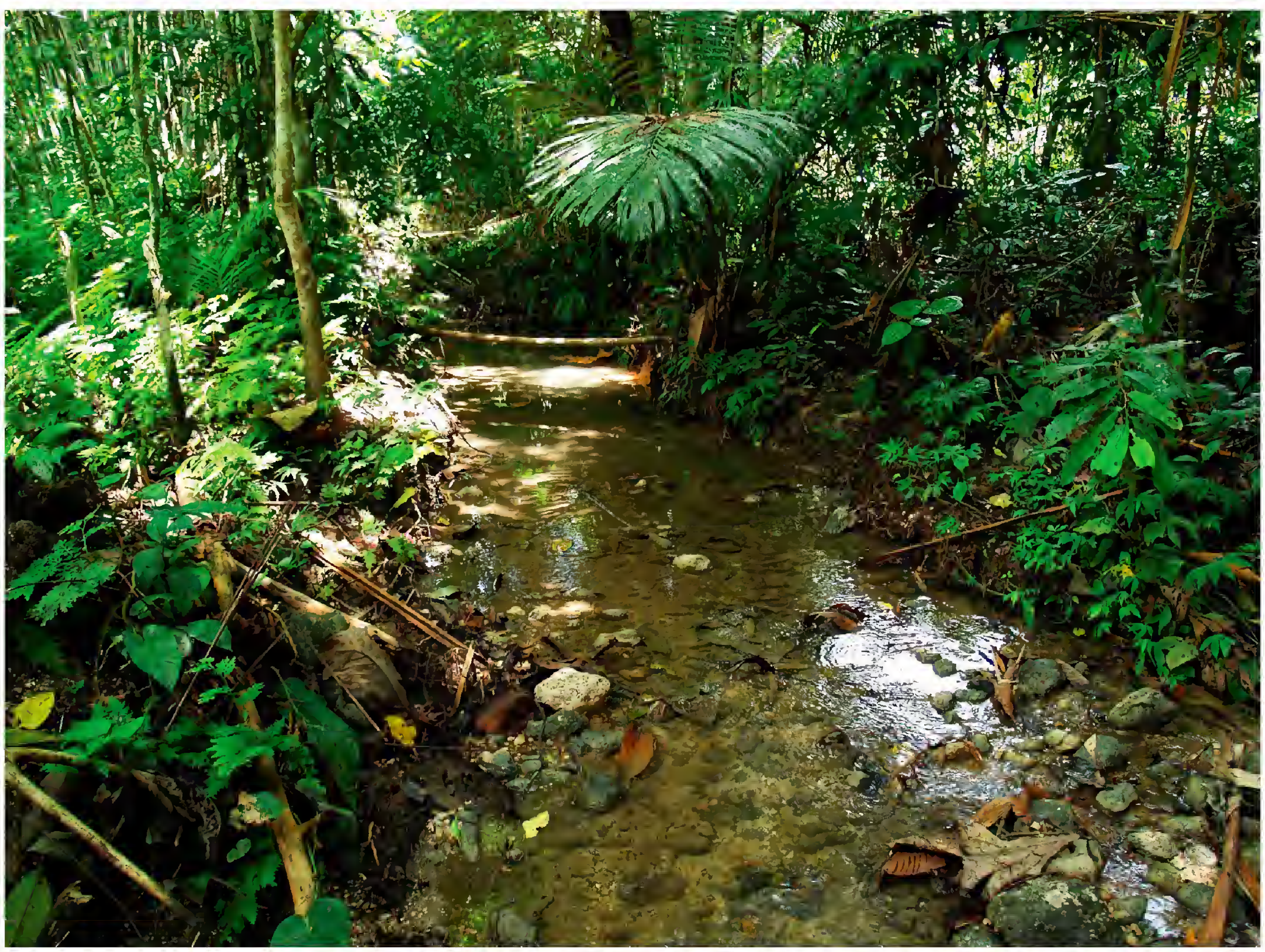
3

Figures 1-3. *Argiolestes zane* sp. nov., holotype ♂. 1 – Tip of abdomen, ventral view; 2 – Tip of abdomen with outline of the inferior appendages intensified in pencil, ventral view; 3 – Male accessory genitalia, ventral view.

Plate 34

Kalniņš, M.: *Argiolestes zane* sp. nov. from New Guinea (Odonata: Argiolestidae)

1



2

Figures 1-2. Habitats in locus typicus of *Argiolestes zane* sp. nov. 1 – Small forest stream where holotype was caught (photo: M. Kalniņš); 2 – Small forest stream where paratypes were caught (photo: M. Kalniņš).

Plate 35

Medvedev, L.N.: New species of Alticinae (Coleoptera: Chrysomelidae) from New Guinea and islands of South-East Asia

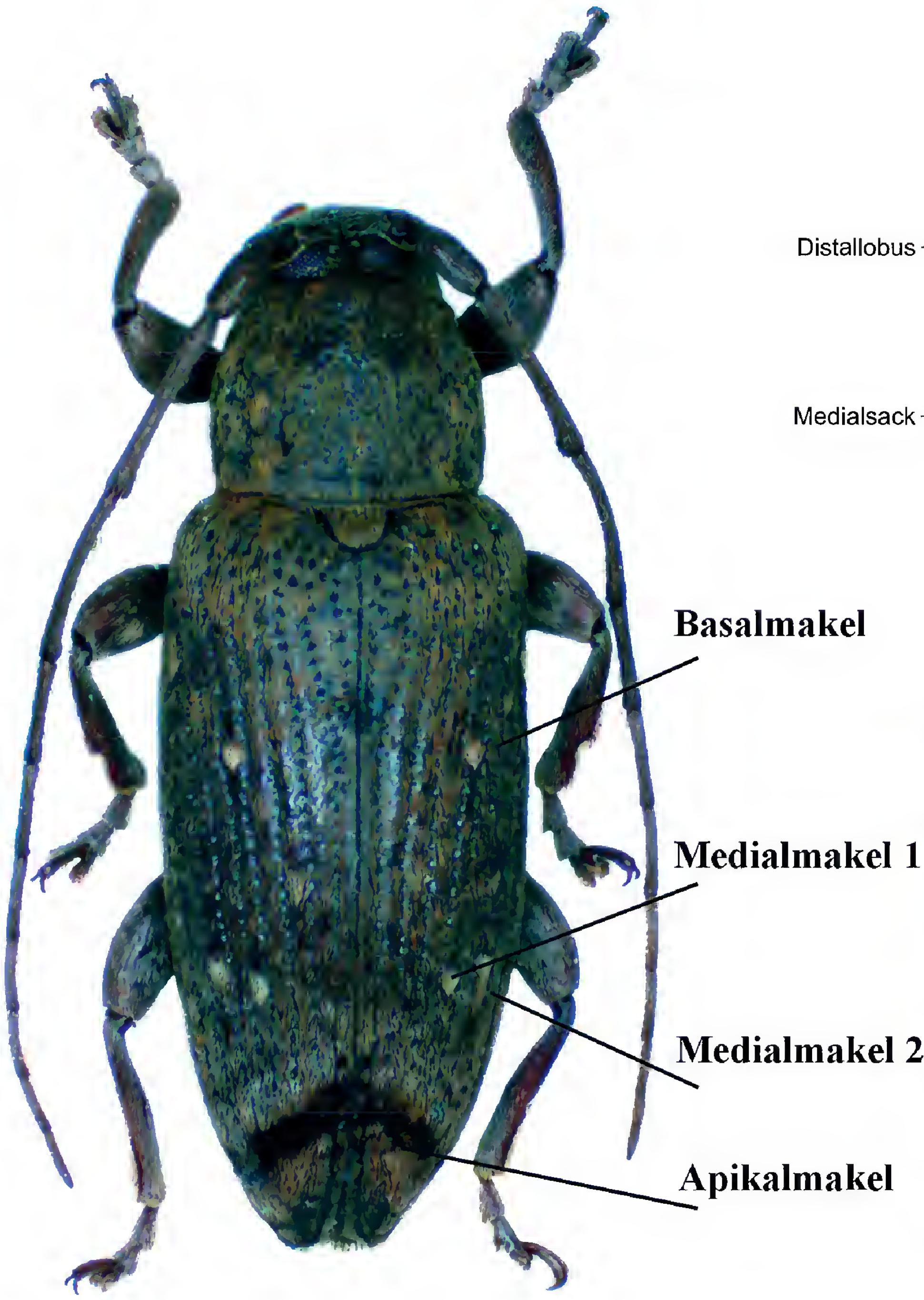
Figures 1-16. Habitus of new Chrysomelidae taxa, dorsal view. 1 – *Nonarthra dembickyi* sp. nov.; 2 – *Hemipyxis laysi* sp. nov.; 3 – *Trachytetra. malukuana* sp. nov.; 4 – *Trachytetra. nigricollis* sp. nov.; 5 – *Chabria pascali* sp. nov.; 6 – *Sutrea cyanea* sp. nov.; 7 – *Sutrea papuana* sp. nov.; 8 – *Sutrea sulawesiana* sp. nov.; 9 – *Lipromorpha sulawesiana* sp. nov.; 10 – *Arsipoda fulvicornis* sp. nov.; 11 – *Arsipoda fulva* sp. nov.; 12 – *Arsipoda gorbunovi* sp. nov.; 13 – *Acrocrypta manfredi* sp. nov.; 14 – *Acrocrypta marginipennis* sp. nov.; 15 – *Acrocrypta fulva palavanica* ssp. nov.; 16 – *Phygasia luzonica* sp. nov.

Plate 36

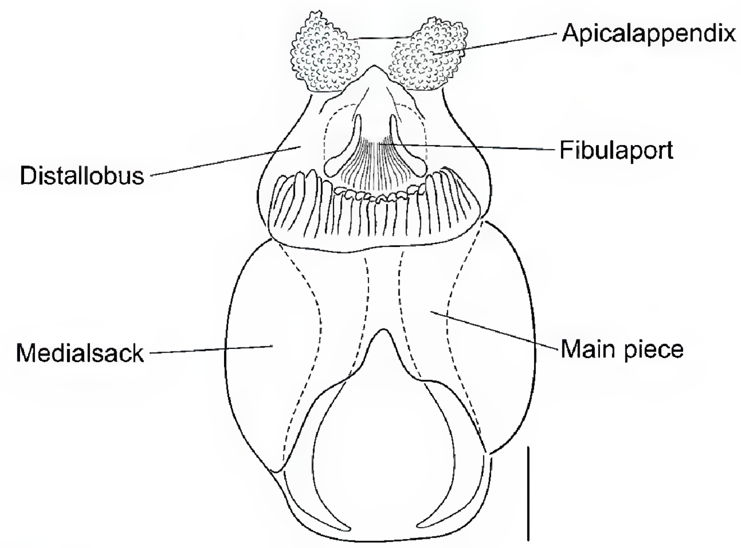
MEY, W.: *Gerontha peterseni* sp. nov. - a new species from Papua New Guinea (Lepidoptera: Tineidae) ...

Figures 1-2. Habitus of Papuan *Gerontha* species. 1 – *G. peterseni* sp. nov., ♂ holotype; 2 – *Gerontha acrosthenia* Zagulajev, 1972, ♂ from Malu surroundings, Papua New Guinea.

Plate 37



1



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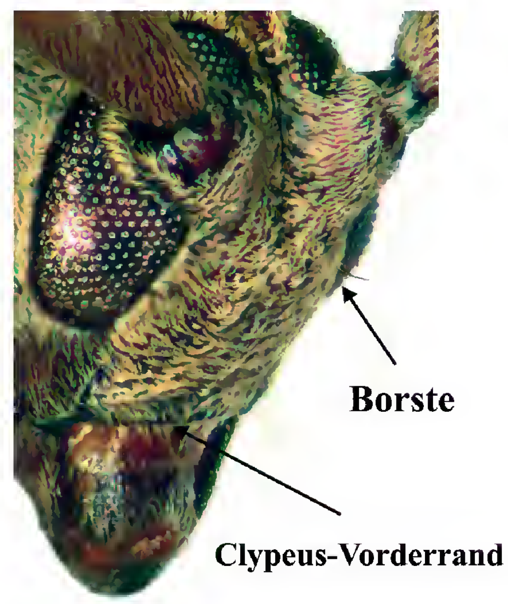

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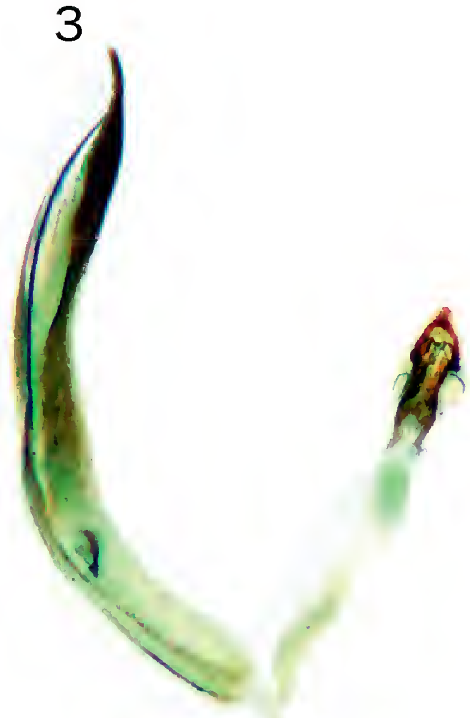
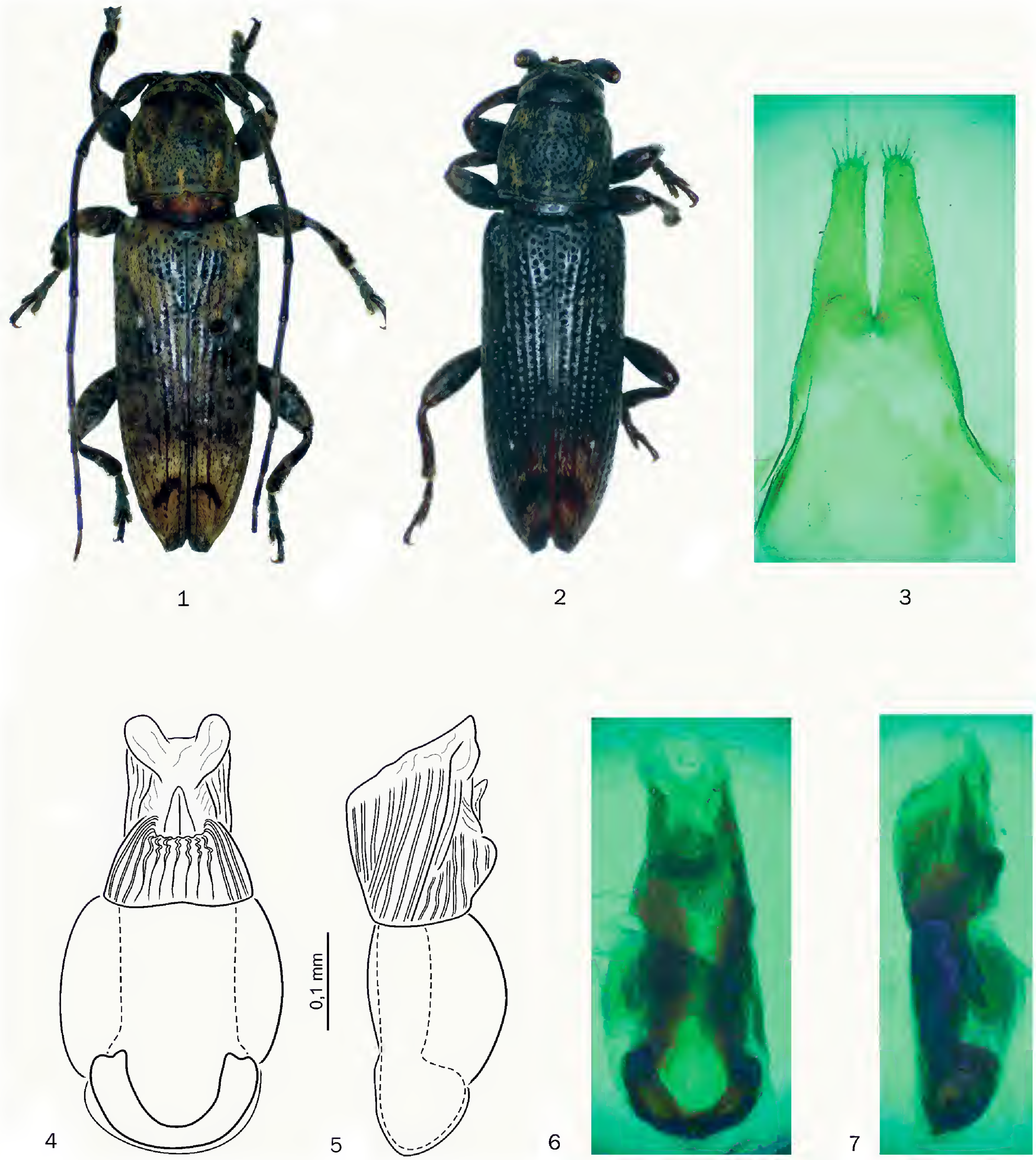


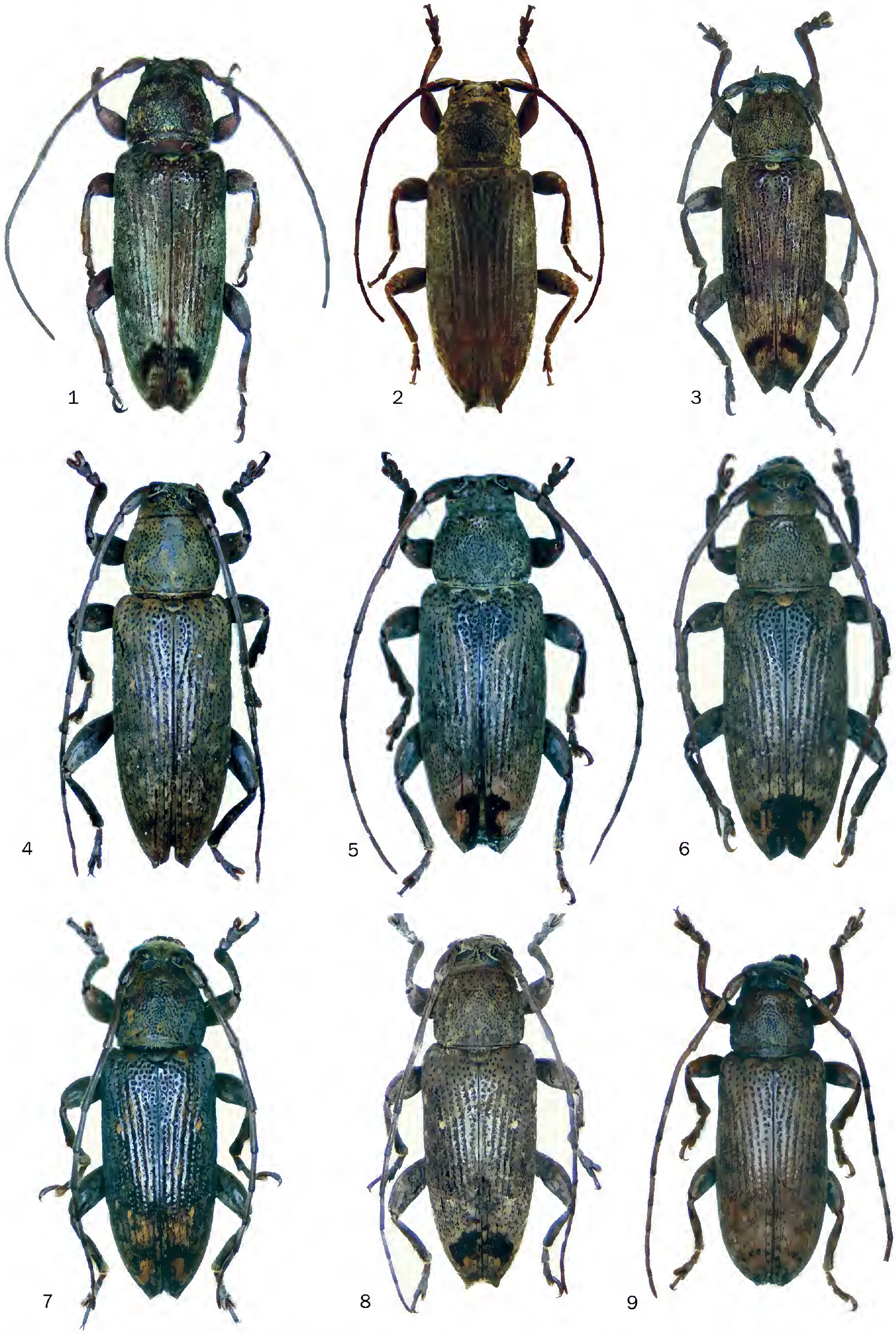
6

Figures 1-6. *Sybra*-Arten, Morphologie. 1 – Bezeichnung der Grundmakel, *Sybra incana,* ♀ von Hiri Insel; 2 – Bezeichnung der Fibula-Teile, *Sybra incana*; 3 – Kopf von *Sybra incana* mit Clypeus-Vorderrand und Sinnes-Borste am Augen-Innenrand; 4-6: Aedeagi. 4 – *Sybra incana*, ventral; 5 – ditto, lateral; 6 – *Sybra subincana*, lateral.

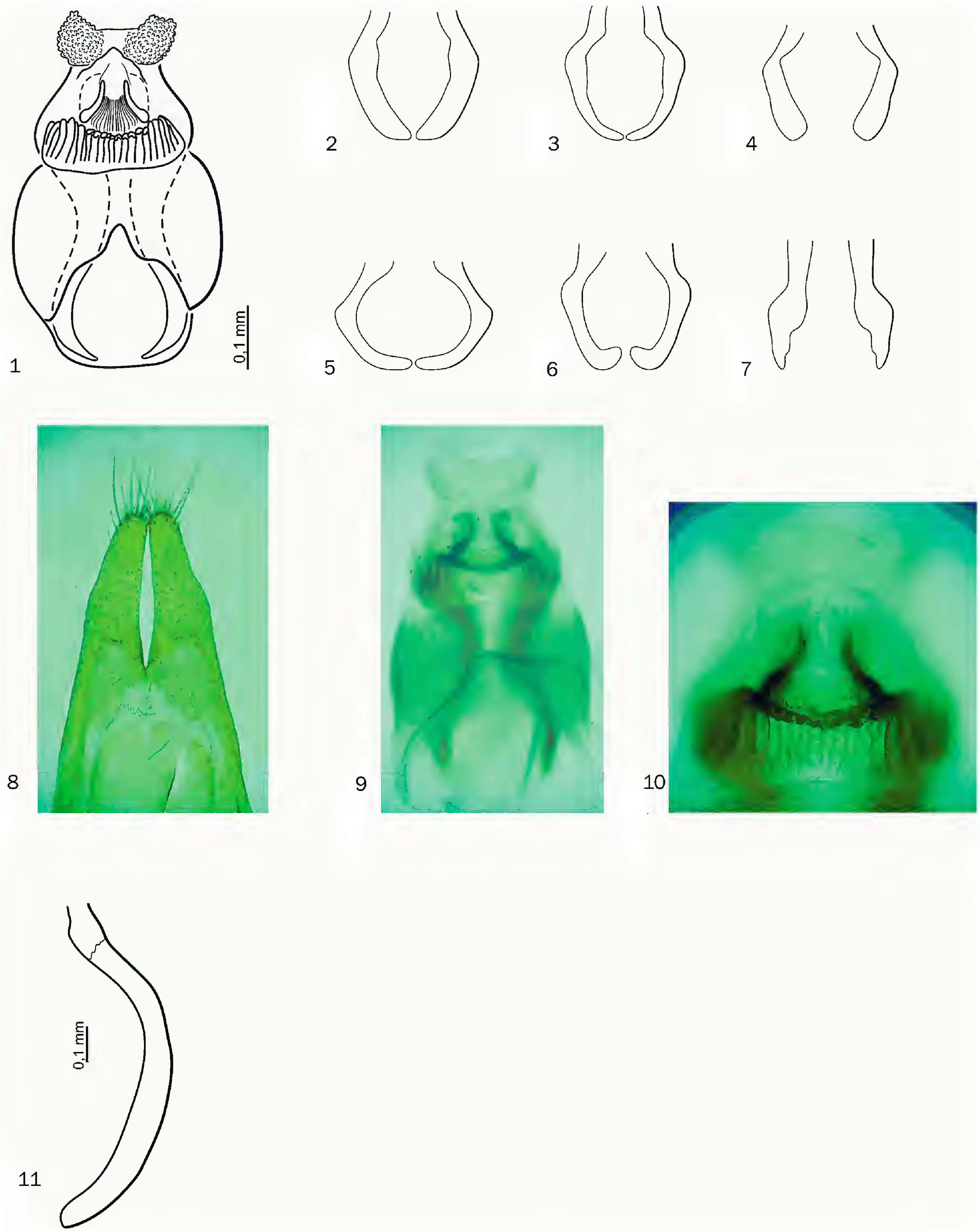


Figures 1-7. *Sybra arator* Pascoe, 1865. 1 – Holotypus ♂; 2 – Holotypus ♂ *Sybra incanoides*; 3 – Parameren (Foto); 4 – Fibula ventral (Zeichnung); 5 – Fibula, lateral (Zeichnung); 6 – Fibula, ventral (Foto); 7 – Fibula, lateral (Foto).

Plate 39

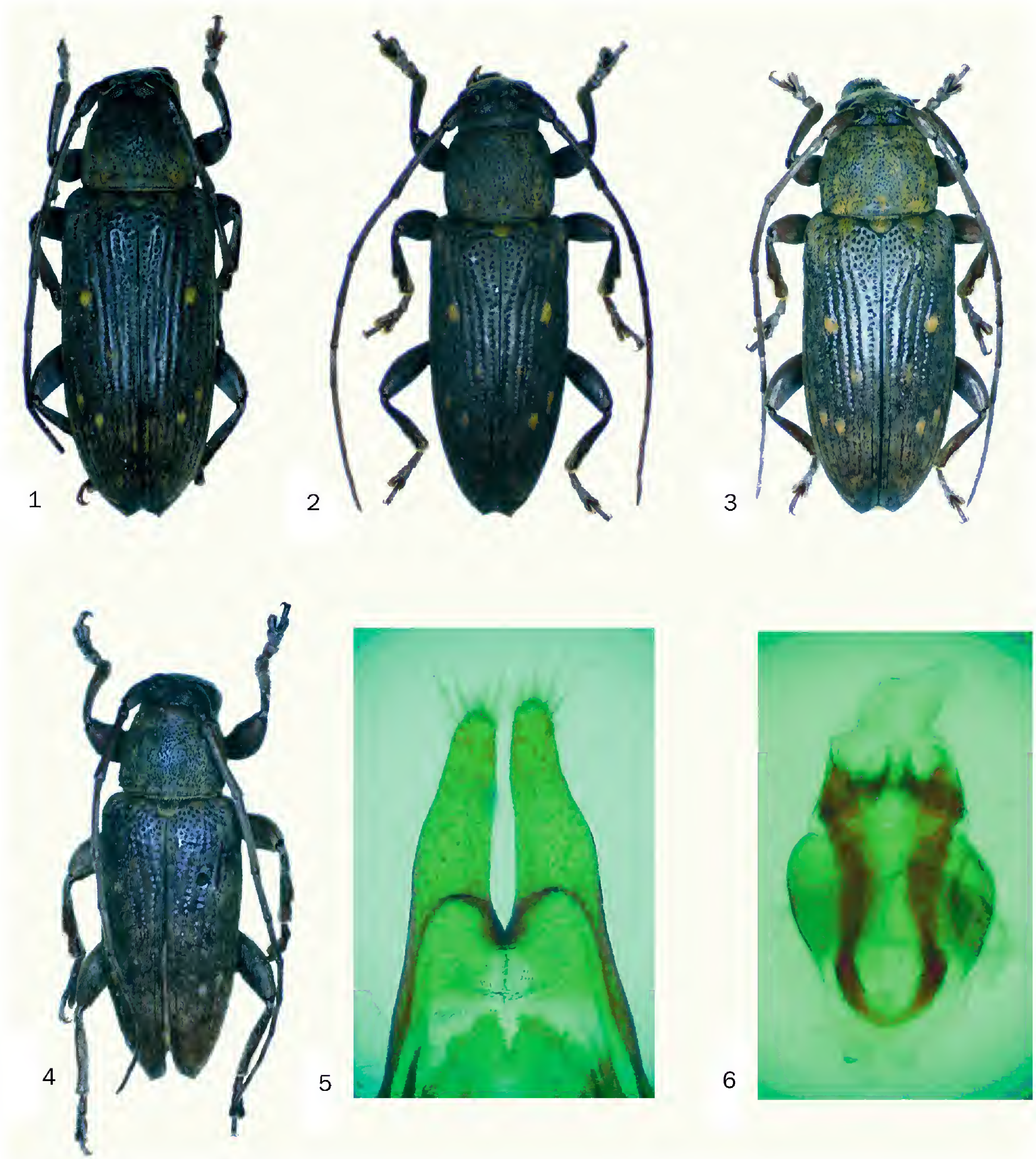


Figures 1-9. *Sybra incana* (Pascoe, 1859). 1 – Holotypus ♀; 2 – Holotypus ♀ *S. mucronata* Pascoe, 1865; 3 – Holotypus ♂ *S. pseudincana* Breuning, 1939; 4 – ♂ von Biak; 5 – ♂ von Yapen; 6 – ♂ von Neu Irland; 7 – ♂ von Misool; 8 – ♂ von Aru; 9 – ♂ von Kaimana (südlicher Bird's Neck).



Figures 1-11. *Sybra incana* (Pascoe, 1859). 1 – Fibula, ventral (Zeichnung); 2-7: verschiedene Formen des main piece. 2-3: Aru; 4 – Kaimana (südlicher Bird's Neck); 5 – Neu Irland; 6 – Raja Ampat: Waigeo; 7 – Raja Ampat: Batanta; 8 – Parameren (Foto); 9 – Fibula, ventral (Foto); 10 – Distallobus (Foto); 11 – Spermathek.

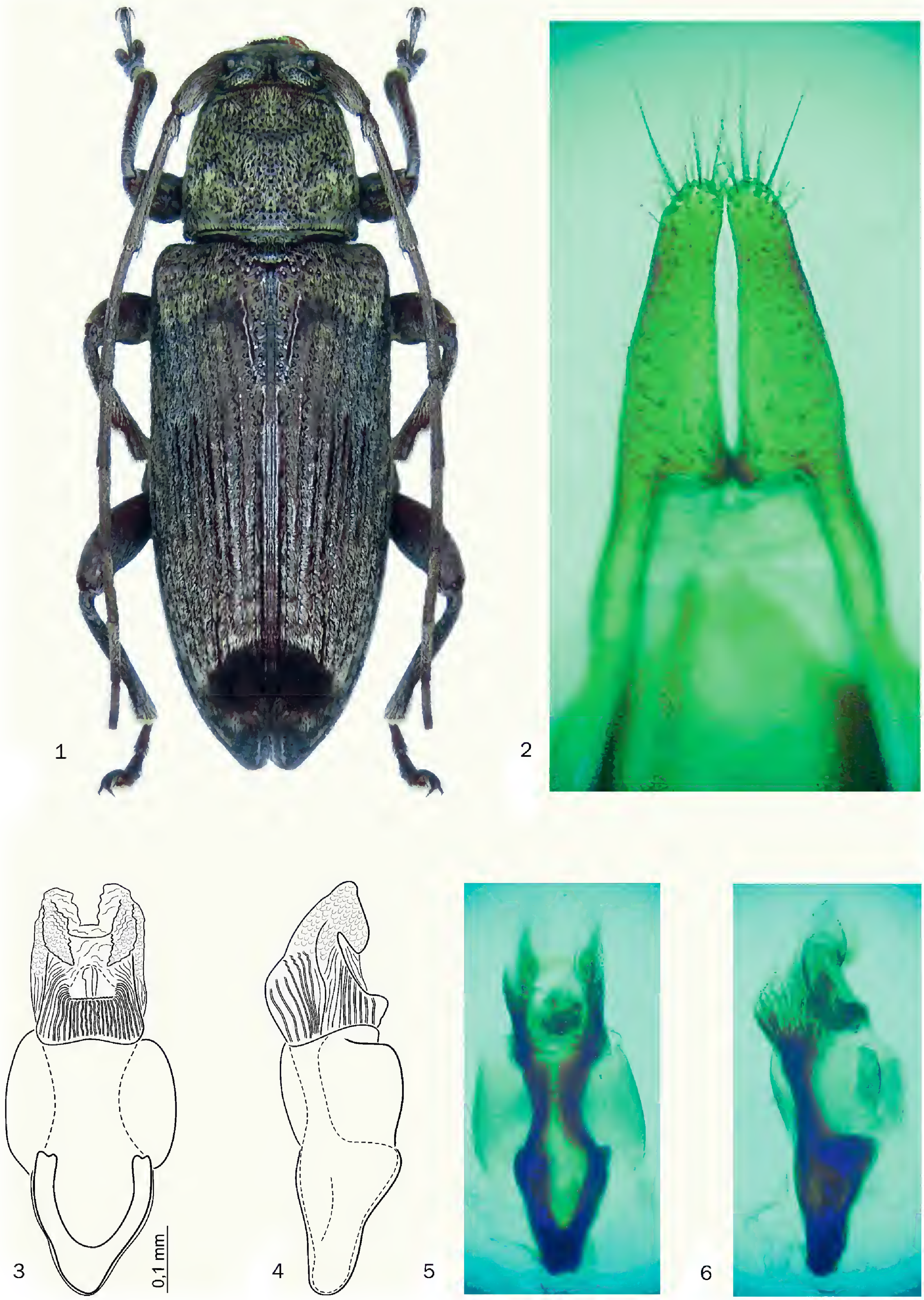
Plate 41



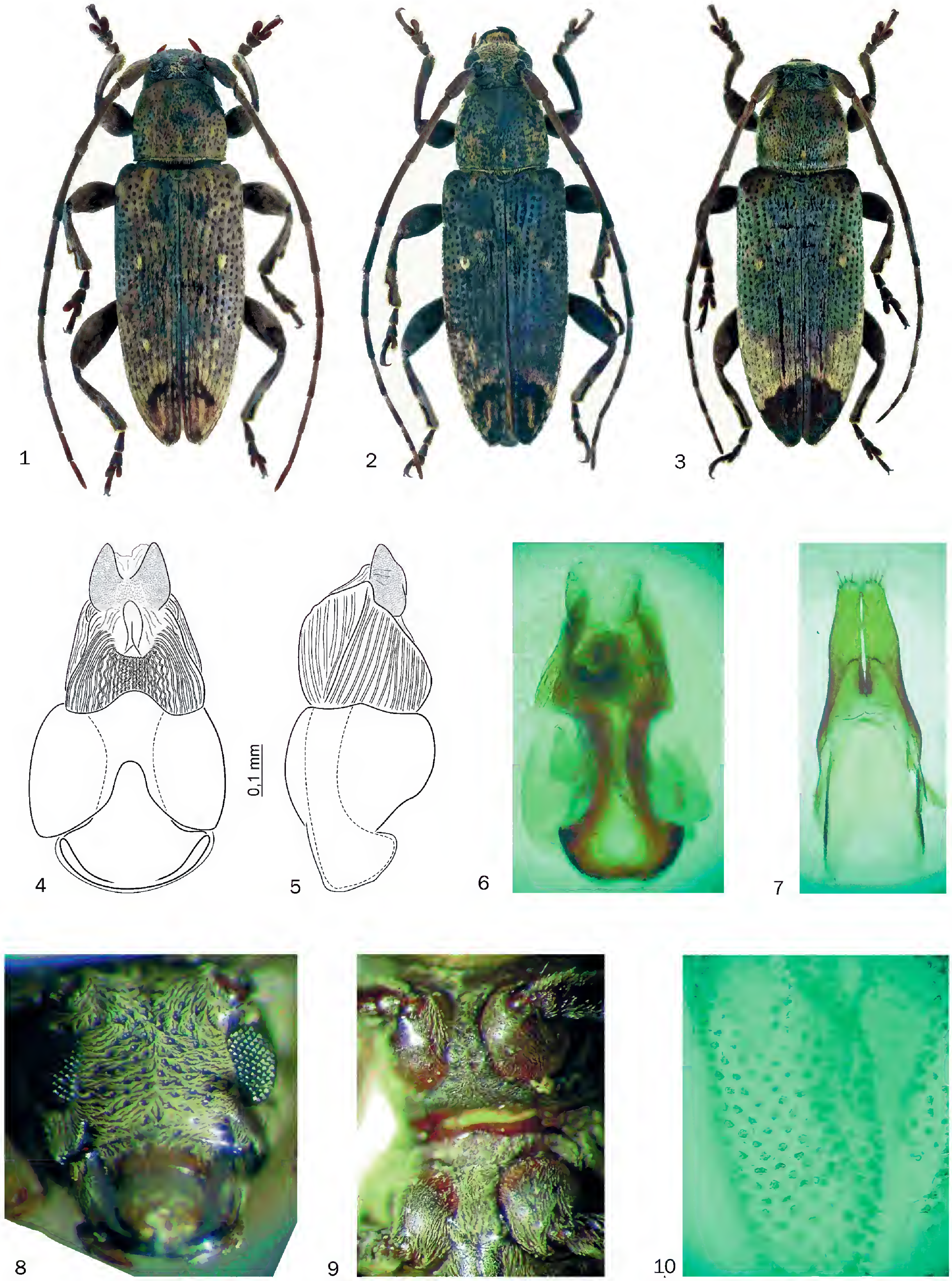
Figures 1-6. *Sybra strigina* Pascoe, 1865. 1 – Holotypus ♀ *R. decemmaculata* Breuning, 1965; 2 – ♂ von Kei-Inseln; 3 – ♀ von Kei-Inseln; 4 – Holotypus ♂; 5 – Parameren (Foto); 6 – Fibula, ventral (Foto).

Plate 42

Skale, A. & Weigel, A.: Zur Taxonomie, Synonymie und Faunistik der Apomecynini der asiatisch-australischen ...



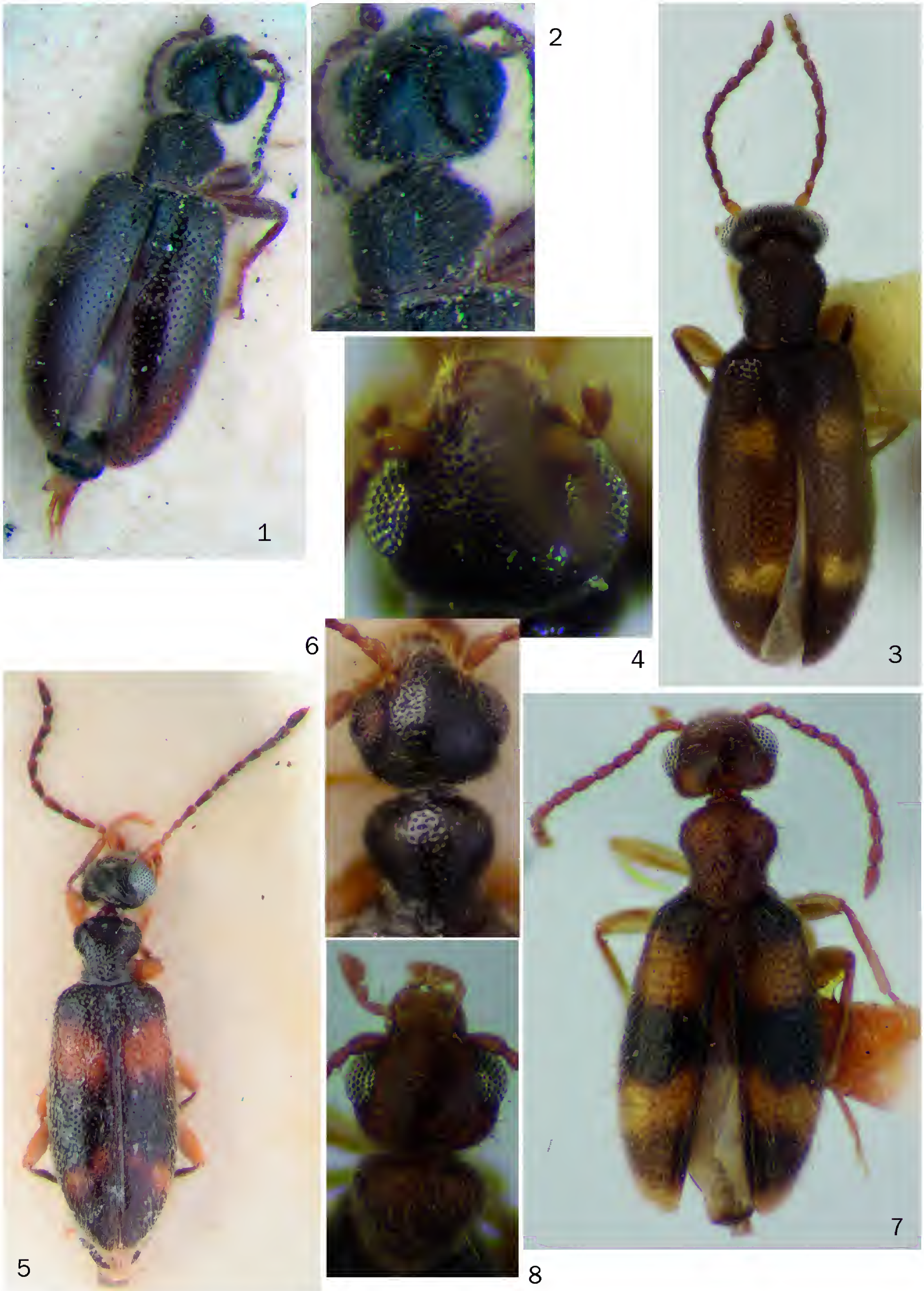
Figures 1-6. *Sybra subincana* Breuning, 1868. 1 – Lectotypus ♀; 2 – Parameren (Foto); 3 – Fibula, ventral (Zeichnung); 4 – Fibula, lateral (Zeichnung); 5 – Fibula, ventral (Foto); 6 – Fibula, lateral (Foto).



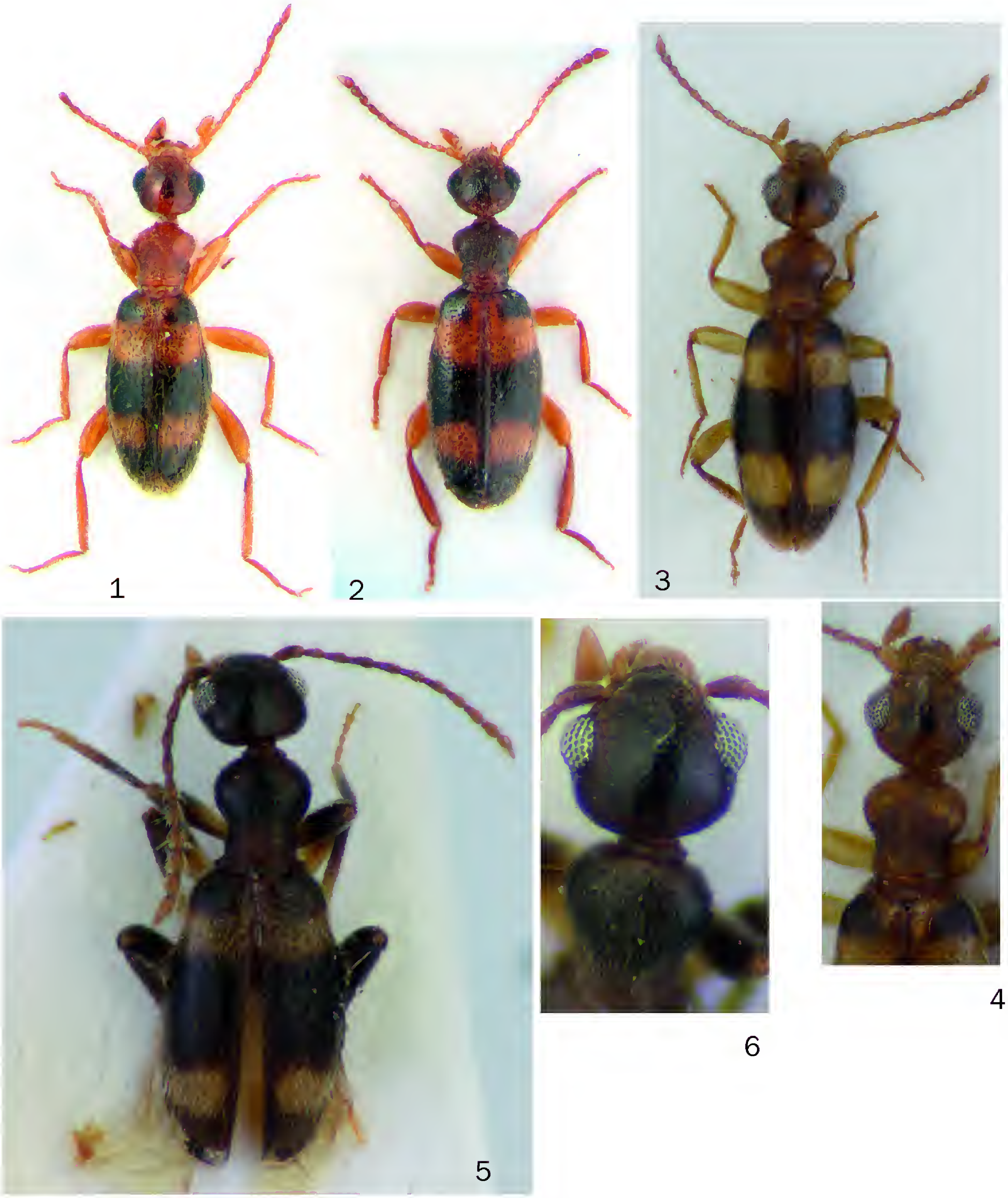
Figures 1-10. *Sybra yokoi* sp. nov.: 1 – Holotypus ♂; 2 – Paratypus ♂; 3 – Paratypus ♀; 4 – Fibula, ventral (Zeichnung); 5 – Fibula, lateral (Zeichnung); 6 – Fibula, ventral (Foto); 7 – Parameren (Foto); 8 – Kopf; 9 – Unterseite vorn (Pro- und Mesothorax); 10 – Innensack-Strukturen (Foto).

Plate 44

Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. adonis* (Pic, 1900), holotype ♀; 3-4 – *S. airi* sp. nov., paratype ♀; 5-7 – *S. albertisi* (Pic, 1900). 5 – Lectotype ♀; 6-7 – Paralectotype ♀.

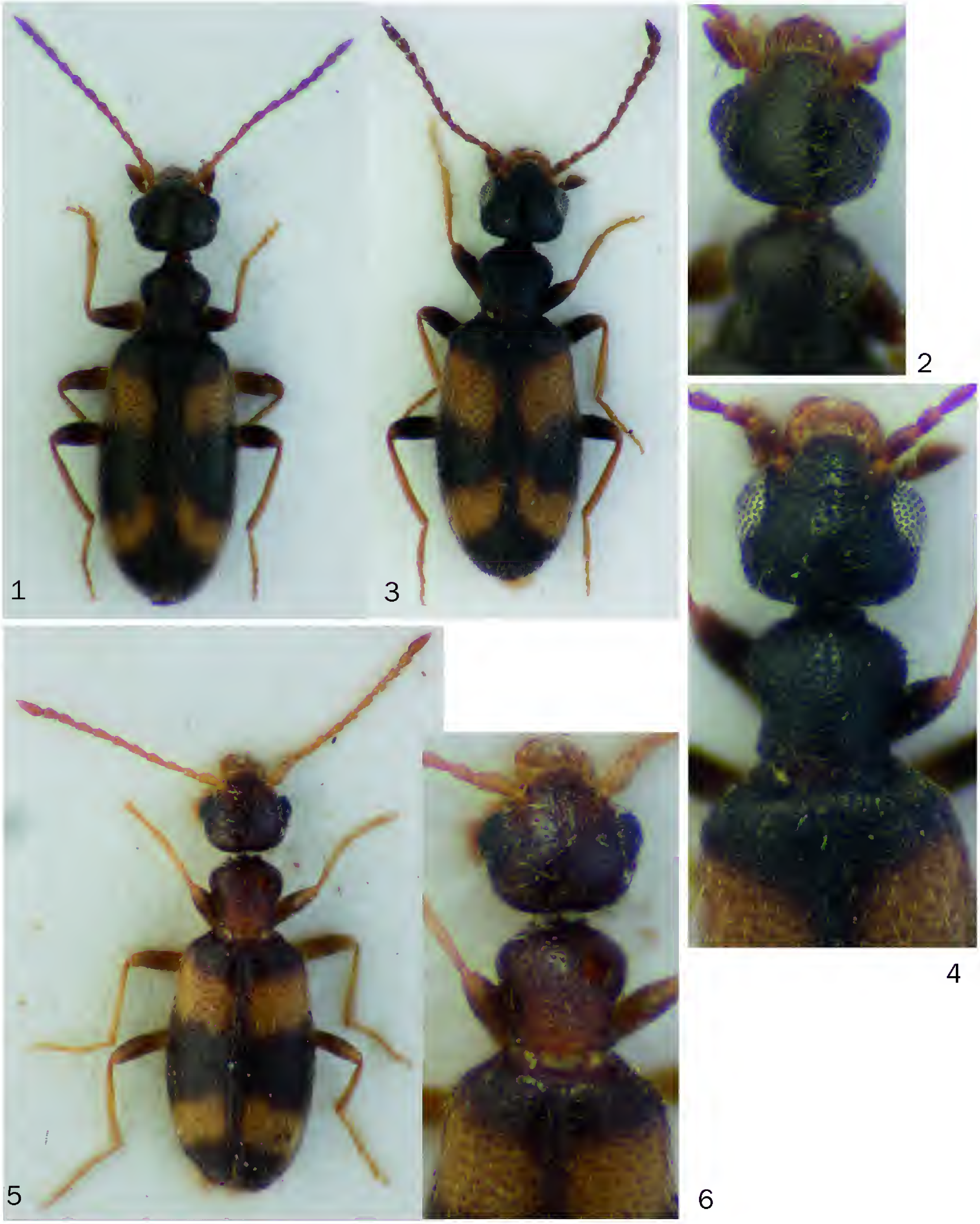


Figures 1-8. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. alfurus* (Pic, 1900), lectotype ♂; 3-4 – *S. carolinensis* (Werner, 1965), paratype from Kusaie Island; 5-6 – *S. curvitibia* sp. nov., paratype ♂; 7-8 – *S. dybasi* (Werner, 1965), paratype ♂ from Koror Island.

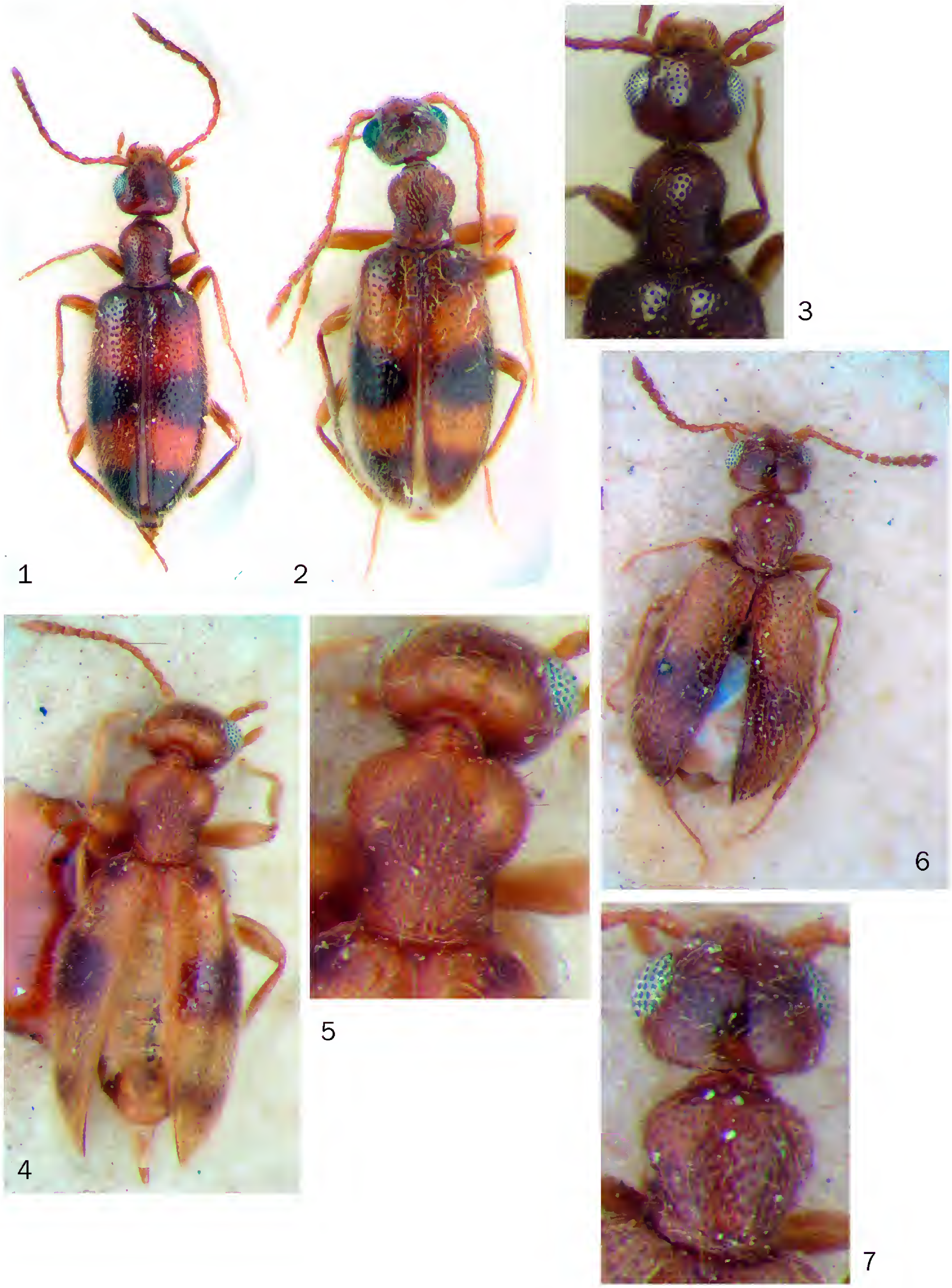


Figures 1-6. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-4 – *S. celeripes* sp. nov. 1-2 – Paratype ♂; 3-4 – Paratype ♀; 5-6 – *S. geminus* sp. nov., holotype ♂.

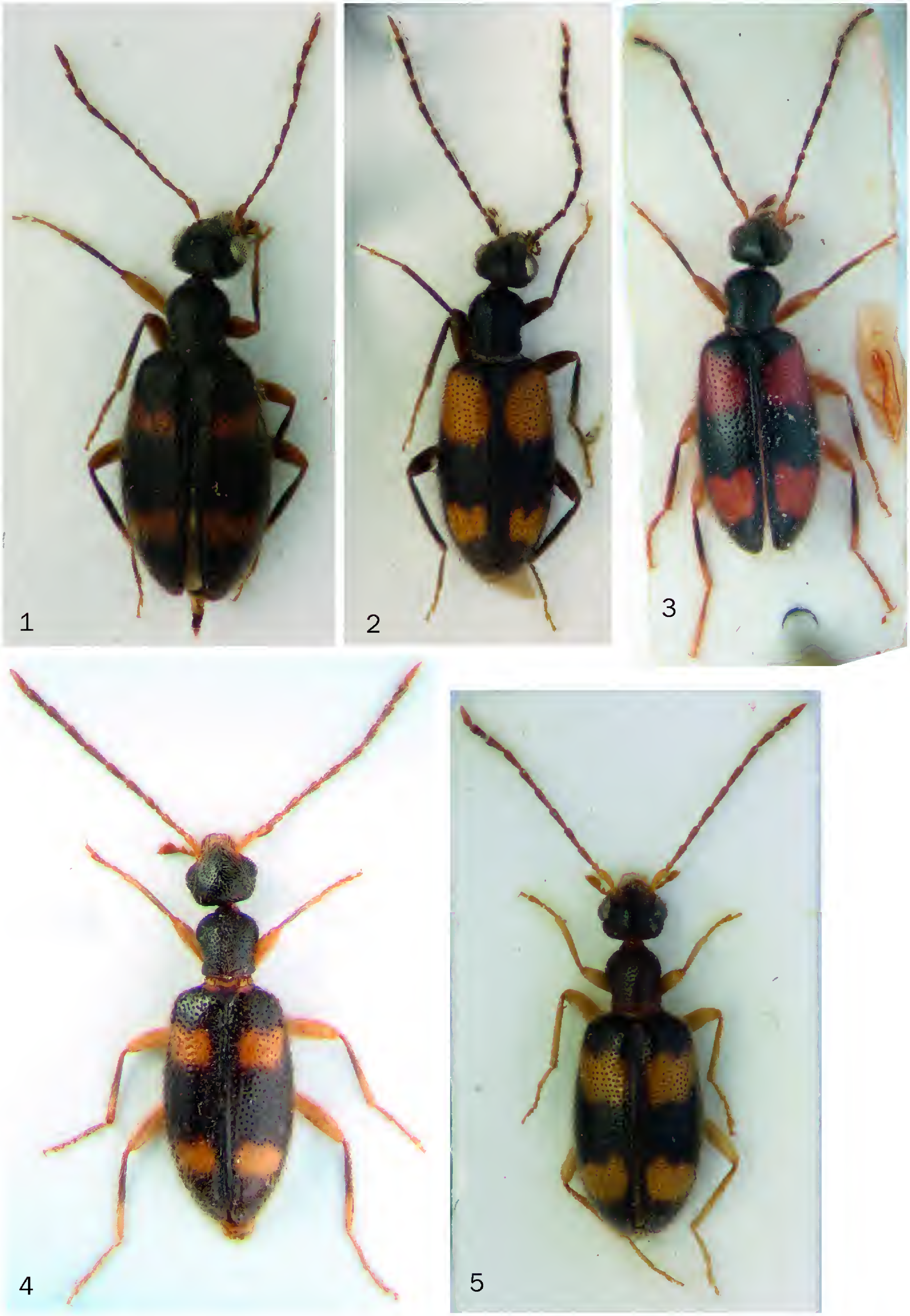
Plate 47



Figures 1-6. *Sapintus dilensis* (Pic, 1900), habitus and head / forebody, dorsal view. 1-2 – ♂ from Waigeo Island; 3-4 – ♂ from Triton Bay, Bird's Neck isthmus, Indonesian New Guinea; 5-6 – ♂ from Morobe environs, E Papua New Guinea.



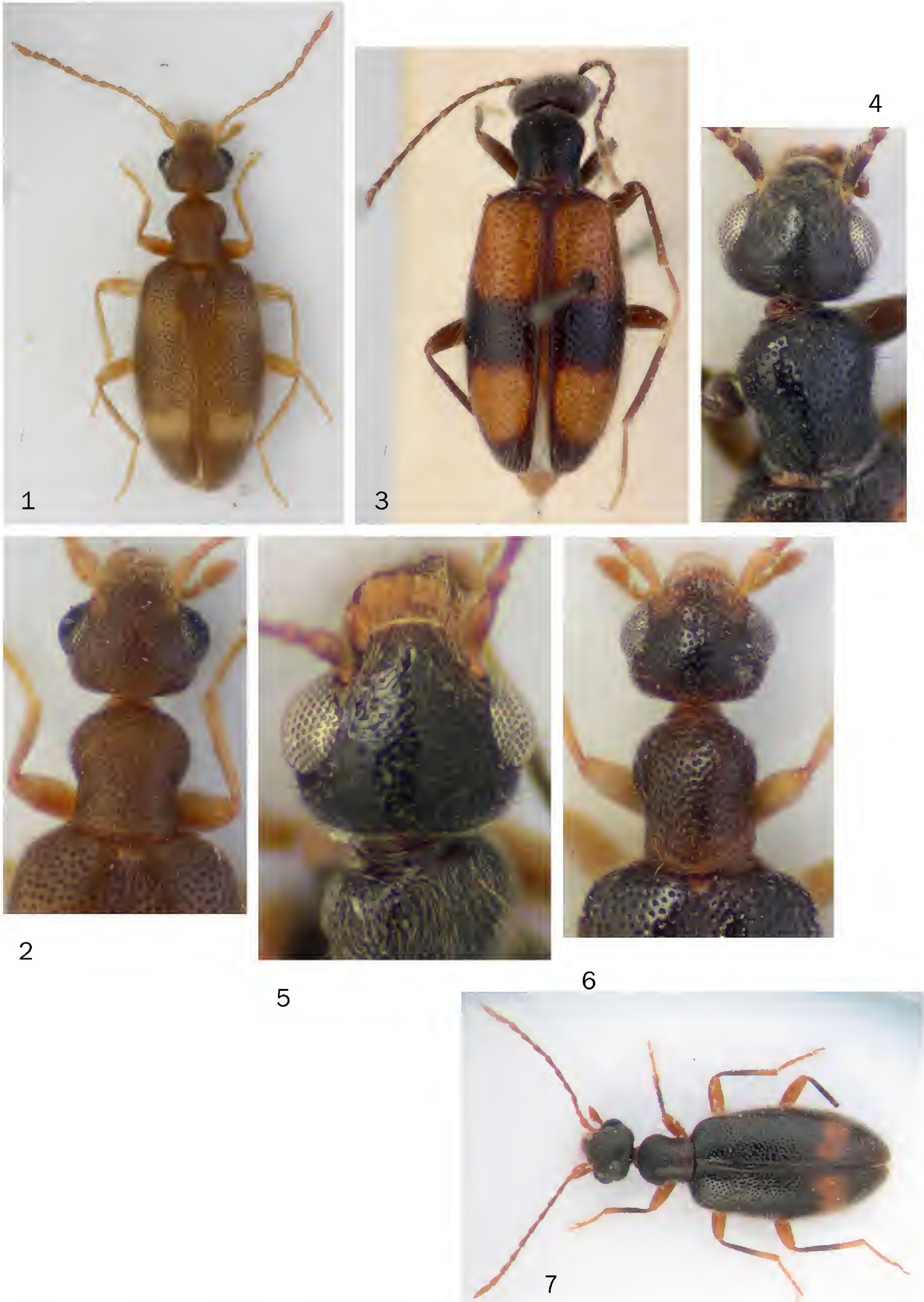
Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-3 – *S. gemitus* sp. nov. 1 – Holotype ♂; 2-3 – Paratype ♂; 4-5 – *S. insulanus* (Pic, 1900), lectotype ♀; 6-7 – *S. hirtipennis* (Pic, 1900), holotype ♀.



Figures 1-5. *Sapintus gracilicornis* (Pic, 1895), habitus, dorsal view. 1 – ♀ from Indonesian Kalimantan; 2 – ♂ from Nabire environs, Indonesian New Guinea; 3 – ♂ from Genyem, Indonesian New Guinea; 4 – ♂ from Somyangga environs, Indonesian New Guinea; 5 – ♀ from Palu environs, Central Sulawesi.

Plate 50

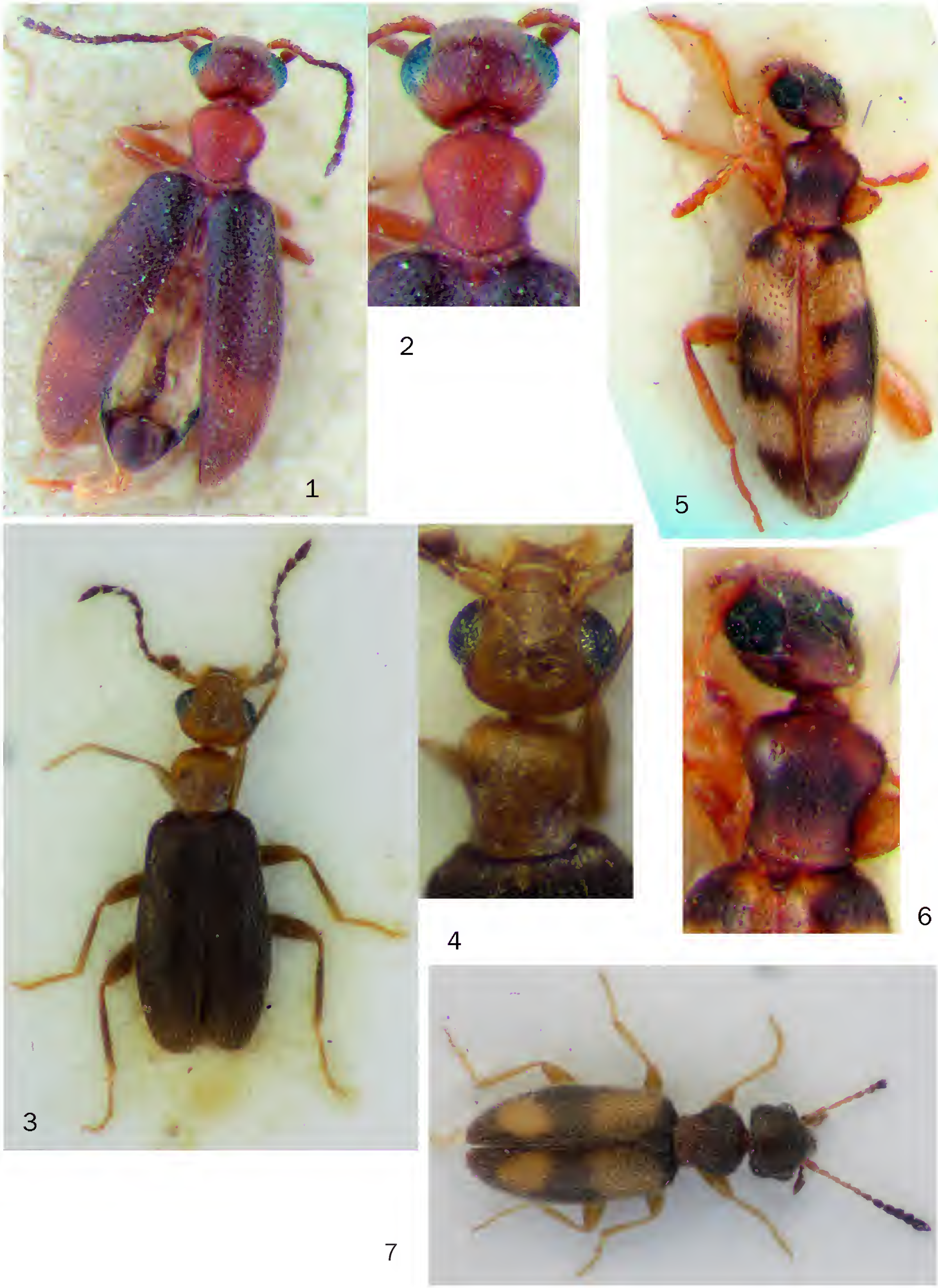
Telnov, D.: Taxonomic revision of the genus *Sapintus* Casey, 1895 (Coleoptera: Anthicidae: Anthicinae) ...



Figures 1-7. *Sapintus gracilicornis* (Pic, 1895), habitus, head / forebody, dorsal view. 1-2 – ♀ from Seram Island; 3 – ♀ from Malu environs, W Papua New Guinea; 4 – ♂ from Nabire environs, Indonesian New Guinea; 5 – ♀ from Indonesian Kalimantan; 6 – ♀ from Palu environs, Central Sulawesi; 7 – ♀ from Central Halmahera.

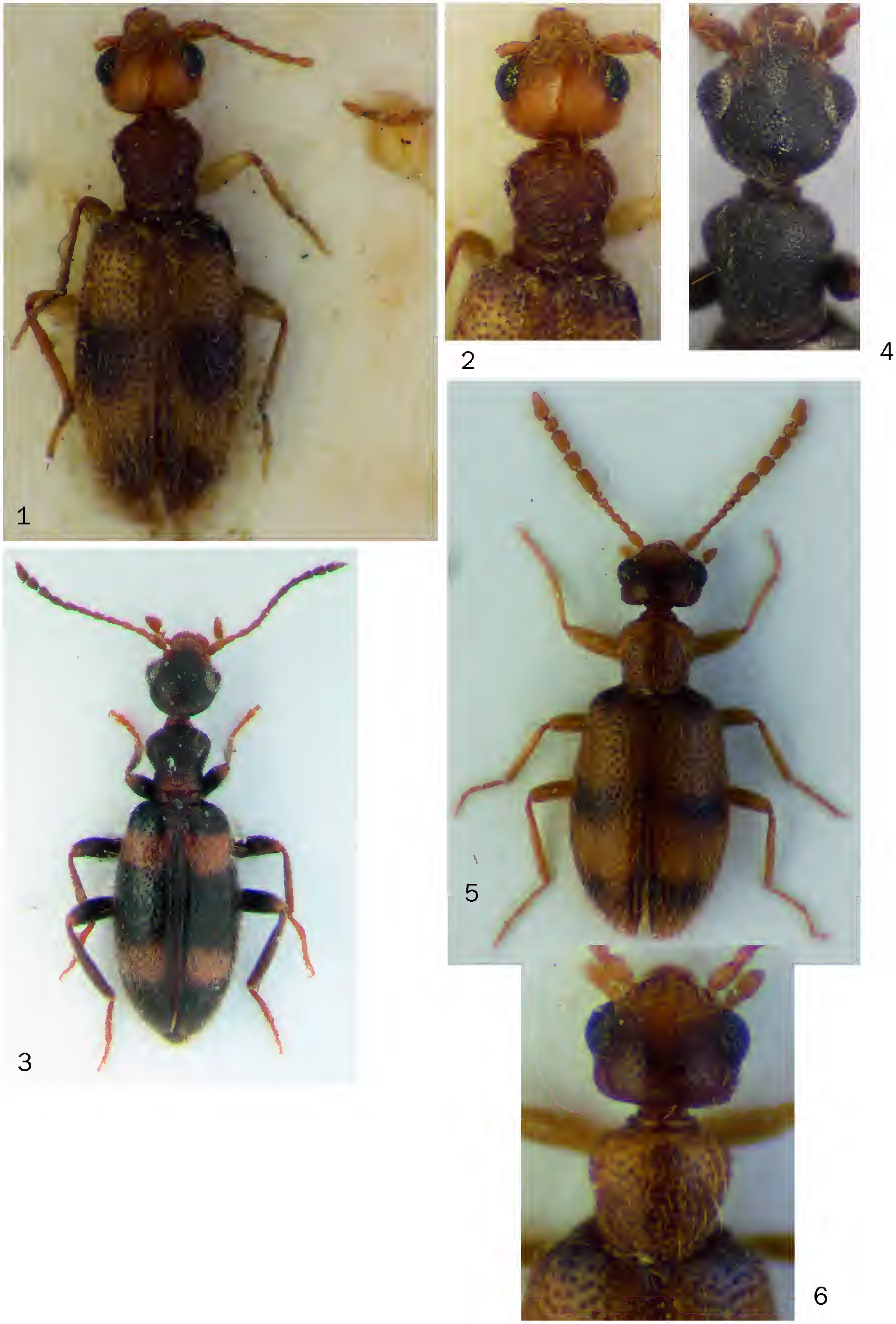
Plate 51

Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody. 1-3 – *S. horvathi* (Pic, 1902). 1-2 – Holotype ♂; 3 – Paratype ♂; 4-5 – *S. insularis* (Werner, 1965), paratype ♂; 6-7 – *S. javanus* (Marseul, 1882a), ♂ from Jayapura environs, Indonesian New Guinea.



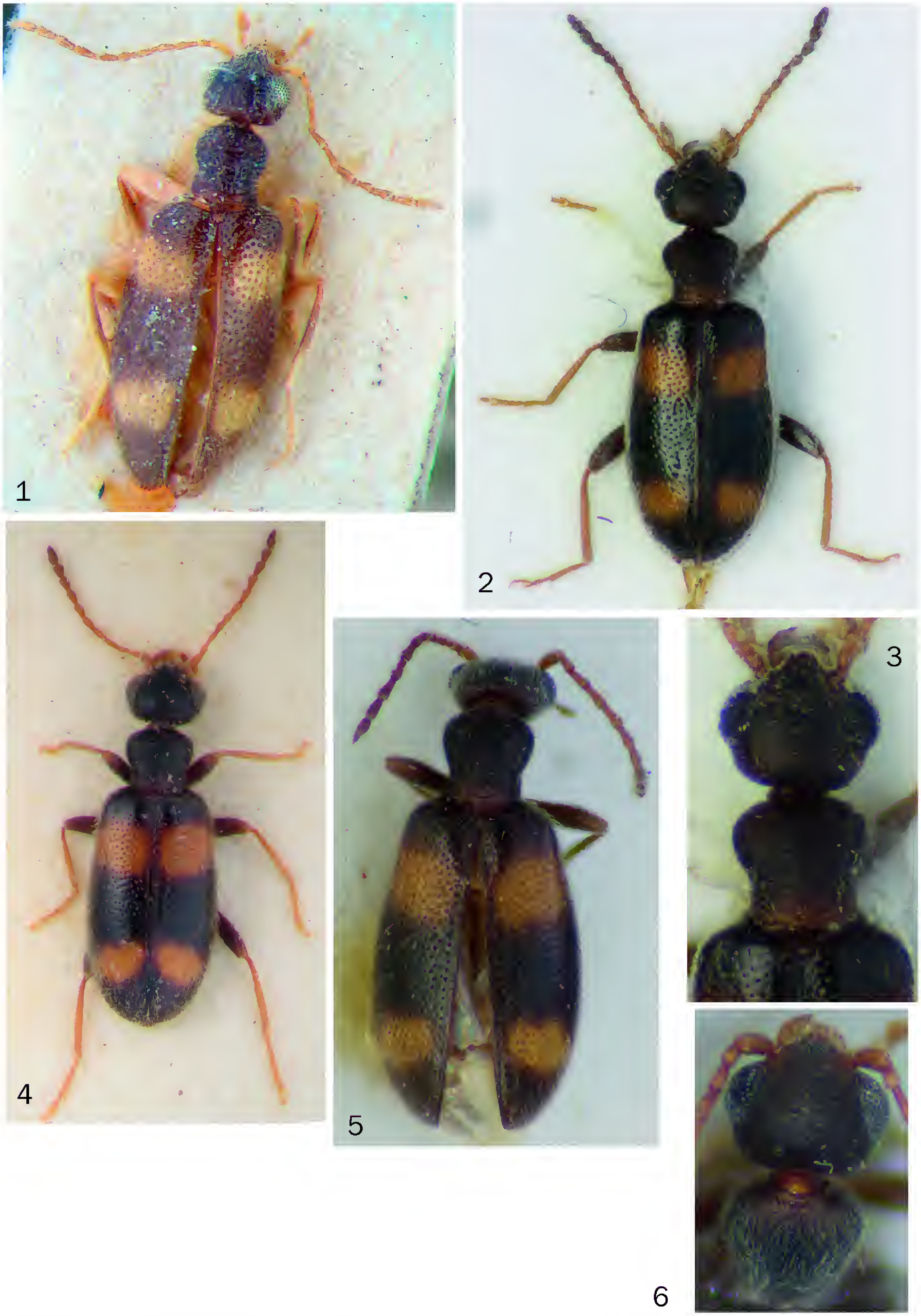
Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. loriae* (Pic, 1900), lectotype ♀; 3-4 – *S. macrops* sp. nov., paratype ♀; 5-6 – *S. madangensis* Uhmann, 1995, holotype ♂; 7 – *S. hartmanni* sp. nov., holotype ♂.

Plate 53



Figures 1-6. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. malayensis* (Pic, 1895), ♀ from Sumbawa island; 3-4 – *S. malut* sp. nov., paratype ♀; 5-6 – *S. monstrosiantennatus* sp. nov., holotype ♂.

Plate 54

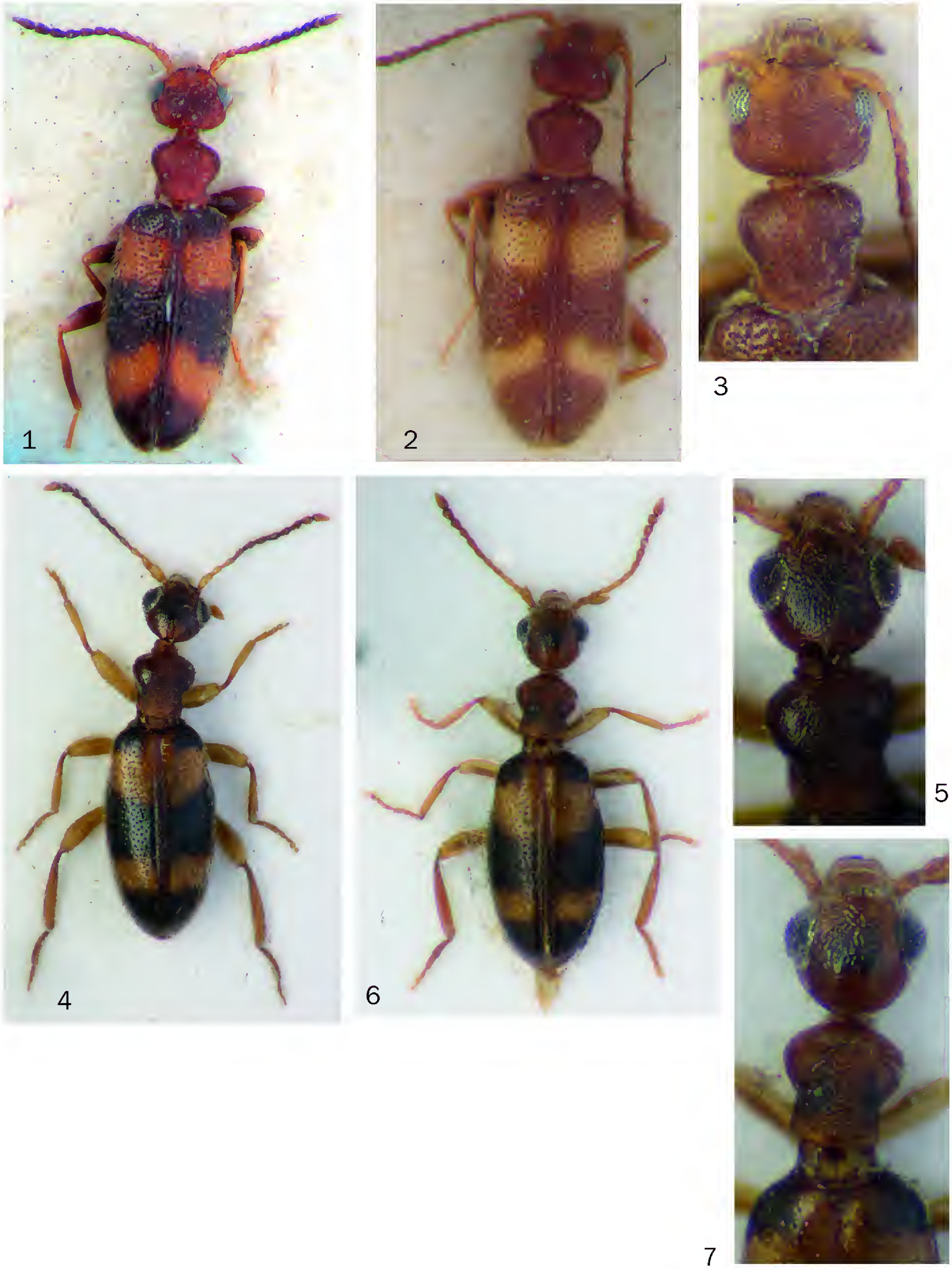


Figures 1-6. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1 – *S. gracilicornis* (Pic, 1895) (holotype ♀ *Anthicus neoguineensis* Pic, 1900); 2-6 – *S. oceanicus* (LaFerté-Sénectère, 1849a). 2-3 – ♀ from Salawati Island; 5-6 – ♂ from Vanuatu.

Plate 55

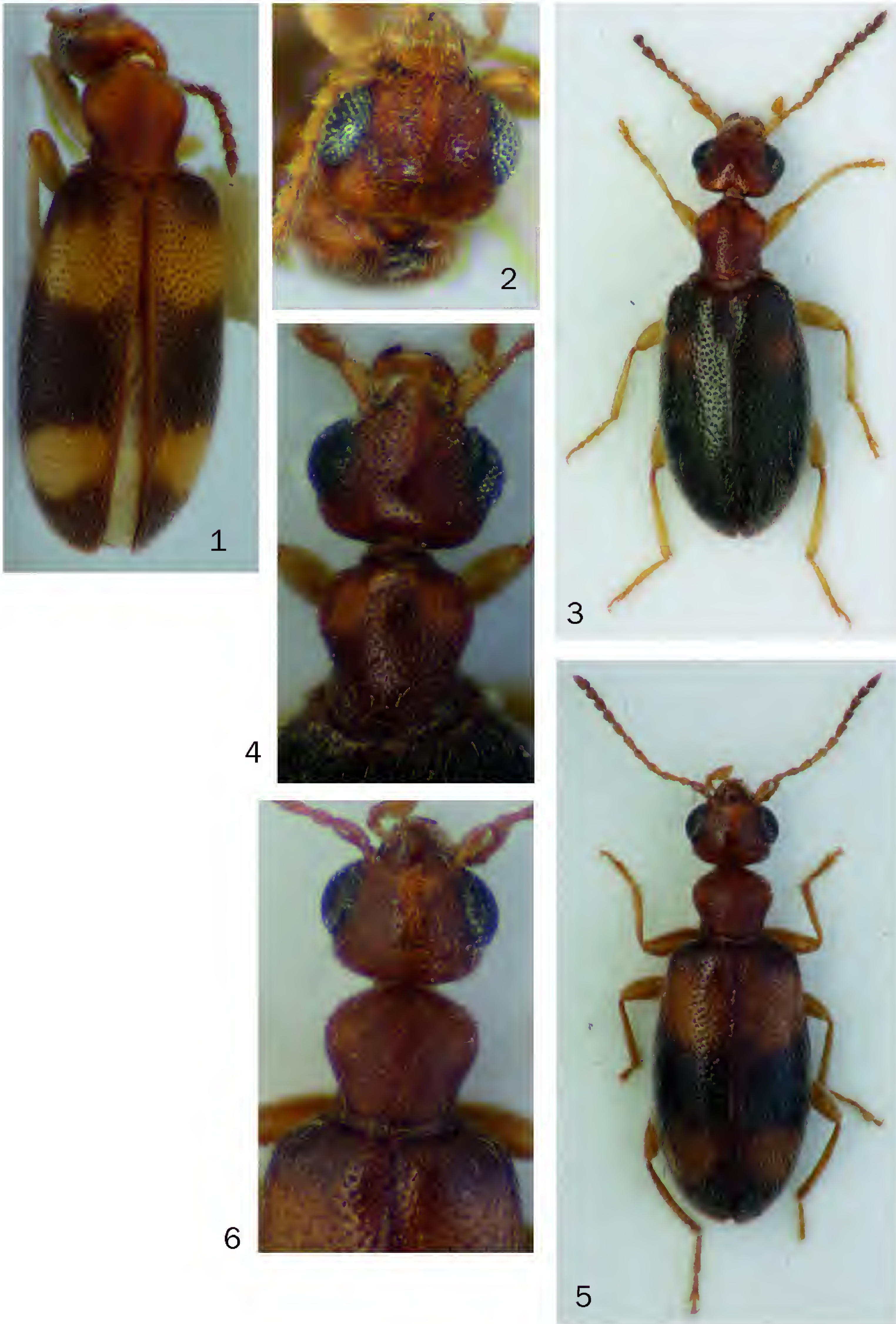
Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-3 – *S. papuus* (Pic, 1900). 1 – Lectotype ♀; 2-3 – Paralectotype ♂; 4-5 – *S. insularis* (Werner, 1965) (holotype ♂ *S. placitus* Bonadona, 1981); 6-7 – *S. dilensis* (Pic, 1900) (holotype ♂ *S. relatus* Bonadona, 1981).

Figures 1-8. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. quadrinotatus* (Pic, 1900), holotype ♂; 3-4 – *S. rugosicollis* (Pic, 1900), lectotype ♀; 5-6 – *S. gracilicornis* (Pic, 1895) (lectotype ♀ *Anthicus gracilicornis* var. *semiobliteratus* Pic, 1900); 7-8 – *S. plectilis* (Pic, 1910), ♂ from Shanghai, China.



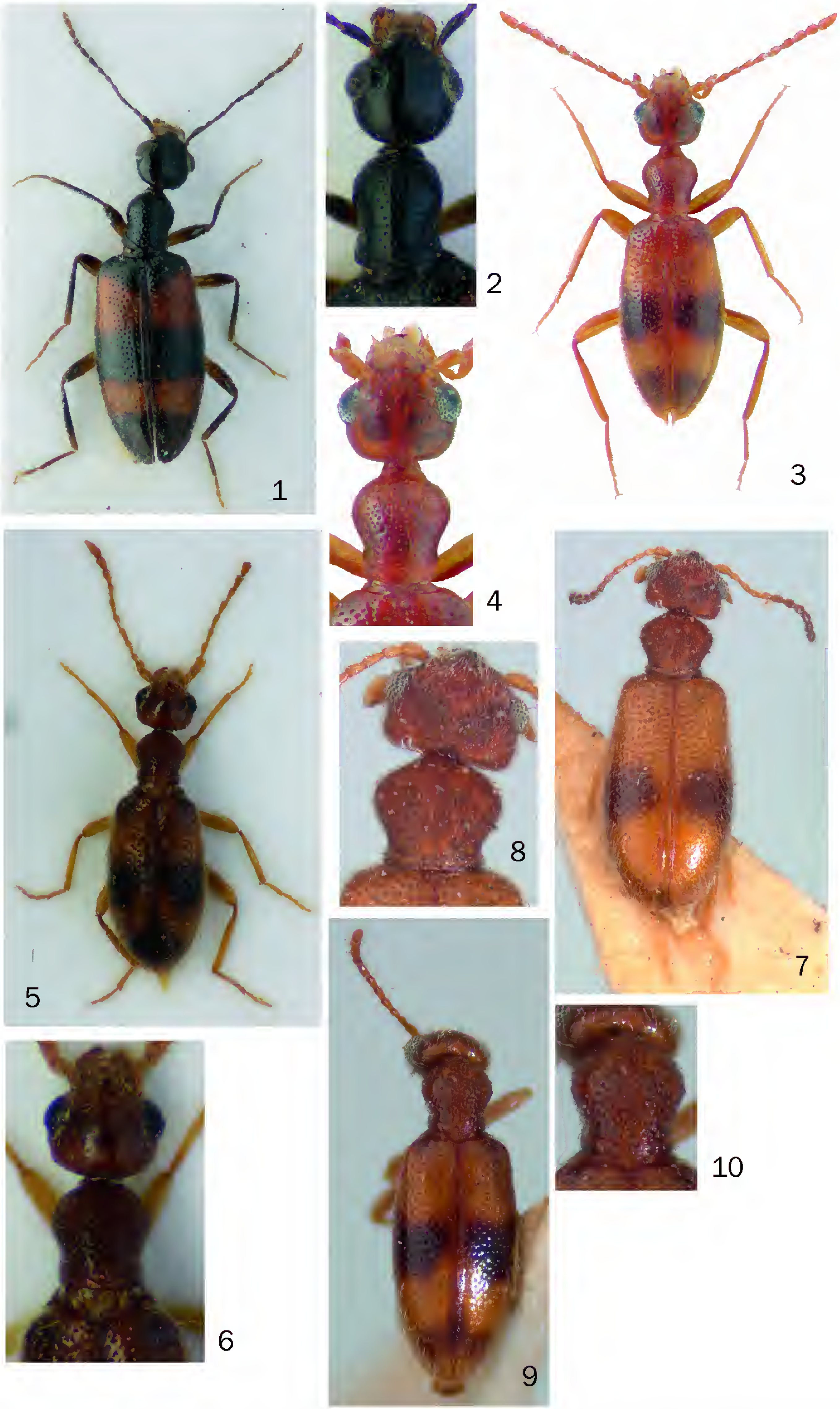
Figures 1-7. Indo-Australian *Sapintus*, habitus and head / forebody, dorsal view. 1-3 – *S. semirugosus* (Pic, 1902). 1 – Holotype ♂; 2-3 – ♂ from Stephansort, E Papua New Guinea; 4-7 – *S. sexualis* sp. nov. 4-5 – Paratype ♂; 6-7 – Paratype ♀.

Plate 58



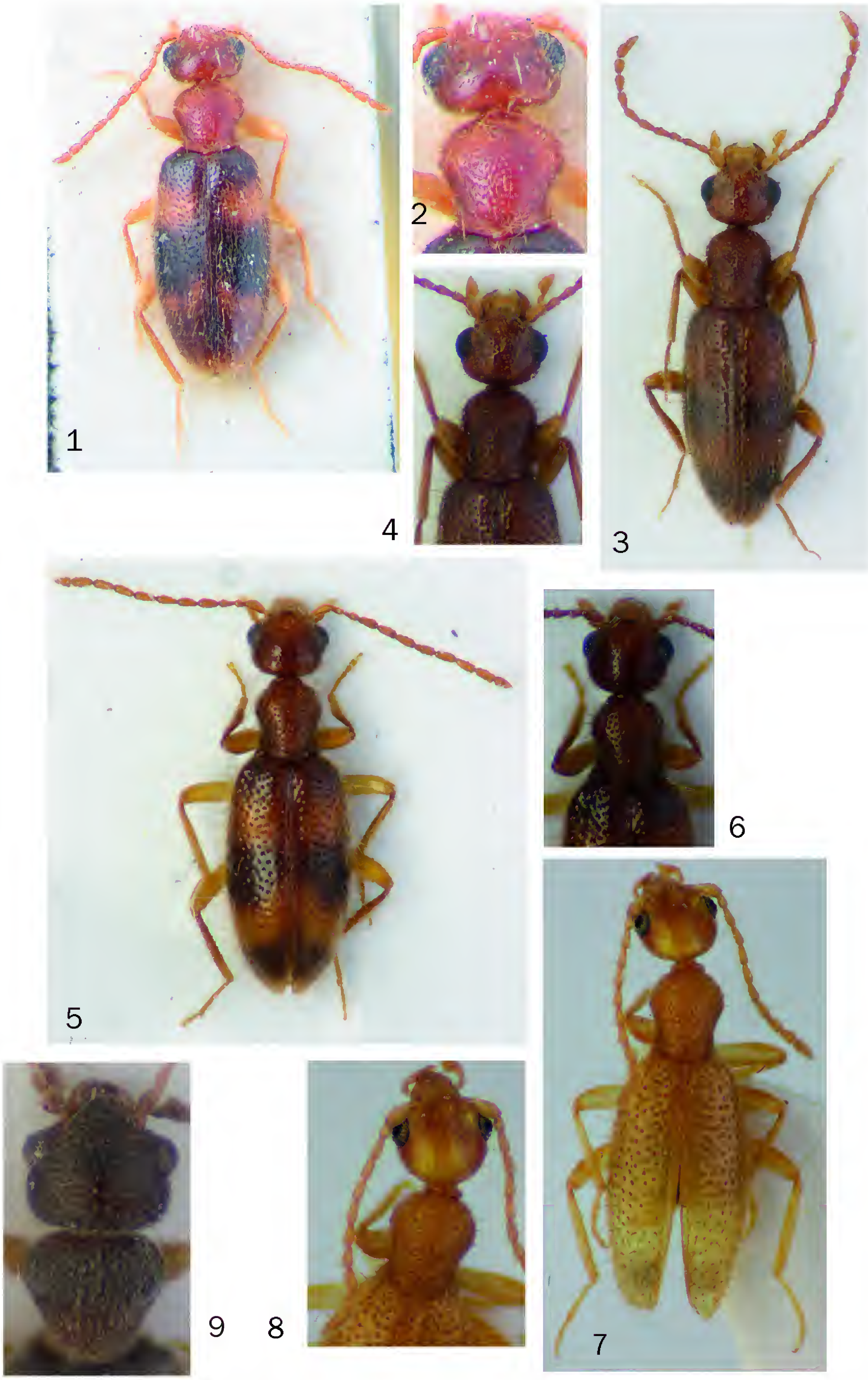
Figures 1-6. *S. vexator* (Werner, 1965), habitus and head / forebody, dorsal view. 1-2 – Paratype ♂ from Gilbert Island; 3-4 – ♂ from Khao Lak environs, S Thailand; 5-6 – ♂ from Kualo, Central Vietnam.

Plate 59



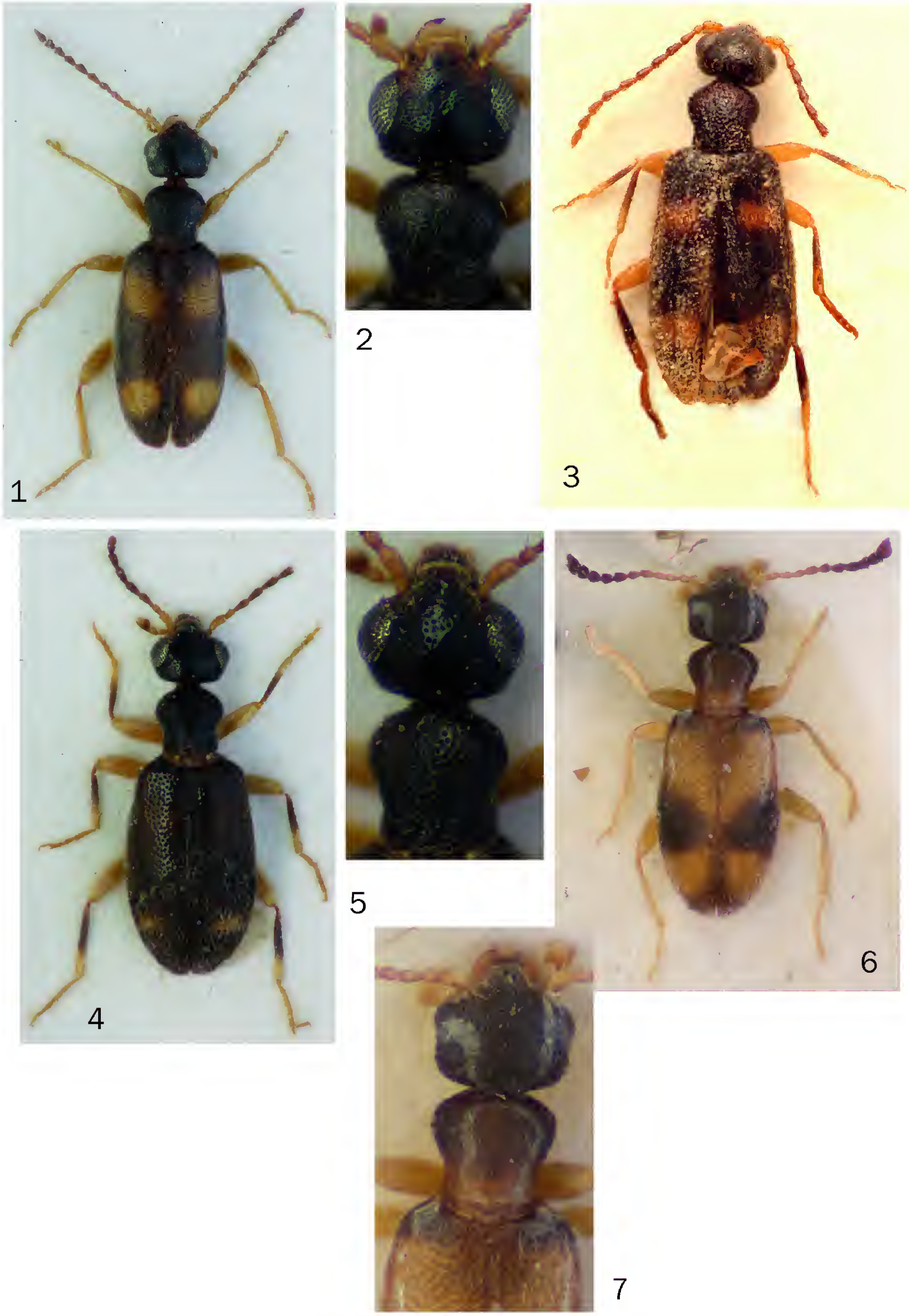
Figures 1-10. Oriental *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. andreaskopetzi* sp. nov., holotype ♀; 3-4 – *S. angulapex* sp. nov., holotype ♀; 5-6 – *S. anguliceps* (LaFerté-Sénectère, 1849a), ♀ from Khao Lak environs, S Thailand; 7-8 – *S. bataviensis* (Marseul, 1882a), syntype; 9-10 – *S. bizonellus* (Marseul, 1882a), syntype.

Plate 60



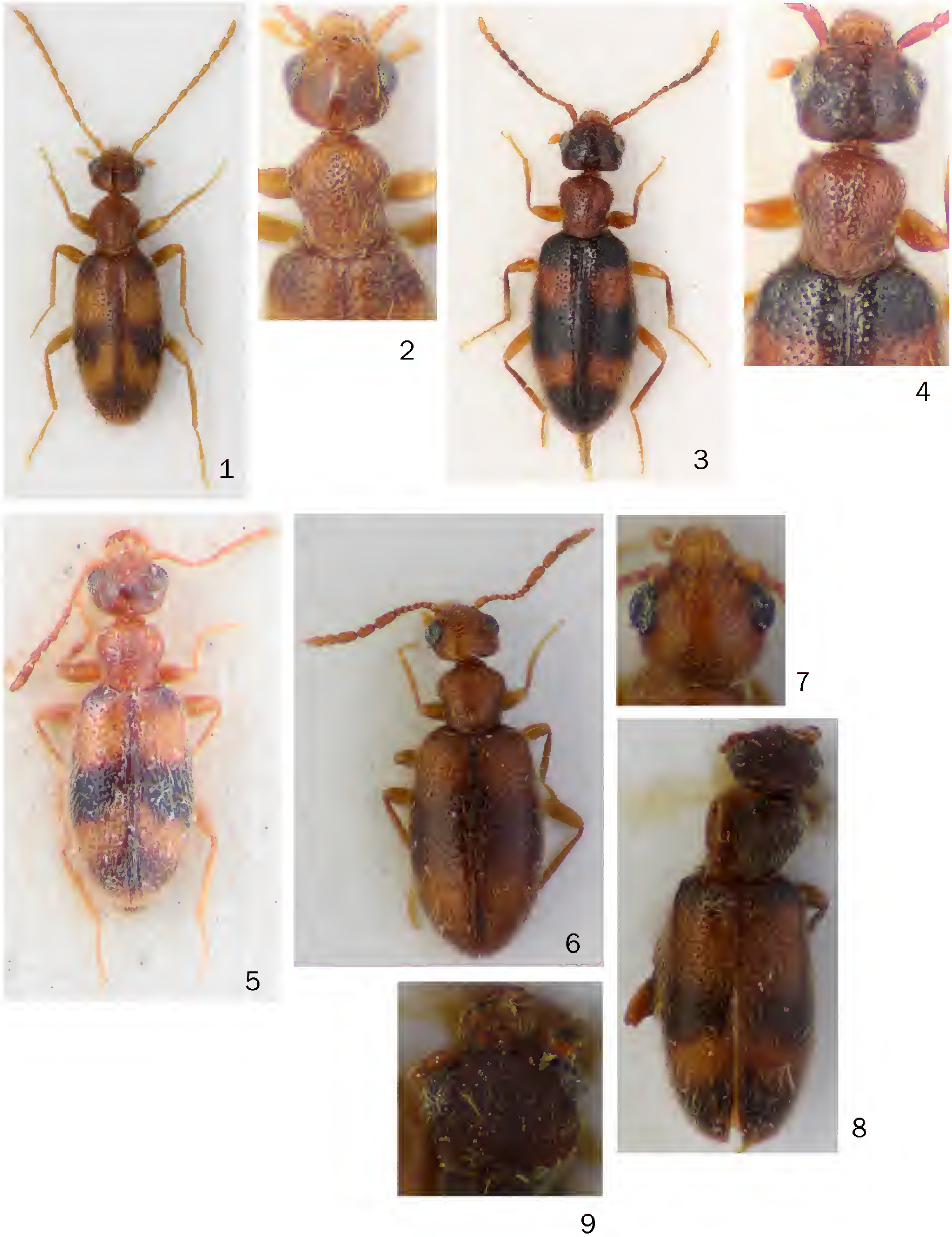
Figures 1-9. Oriental *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. botanicus* (Pic, 1952), holotype; 3-4 – *S. curvatus* sp. nov., holotype ♂; 5-6 – *S. echinatus* sp. nov., holotype ♂; 7-8 – *S. gracilentus* sp. nov., paratype ♀; 9 – *S. hartmanni* sp. nov., holotype ♂.

Plate 61



Figures 1-7. Indo-Australian and Oriental *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. densepunctatus* sp. nov., holotype ♂; 3-5 – *S. dyaulensis* nom. nov. 3 – holotype ♂ *S. propinquus* Bonadona, 1981; 4-5 – ♂ from Nabire environs, Indonesian New Guinea); 6 -7 – *S. flavonotatus* (Pic, 1908), ♂ from Angkor Thom, Cambodia.

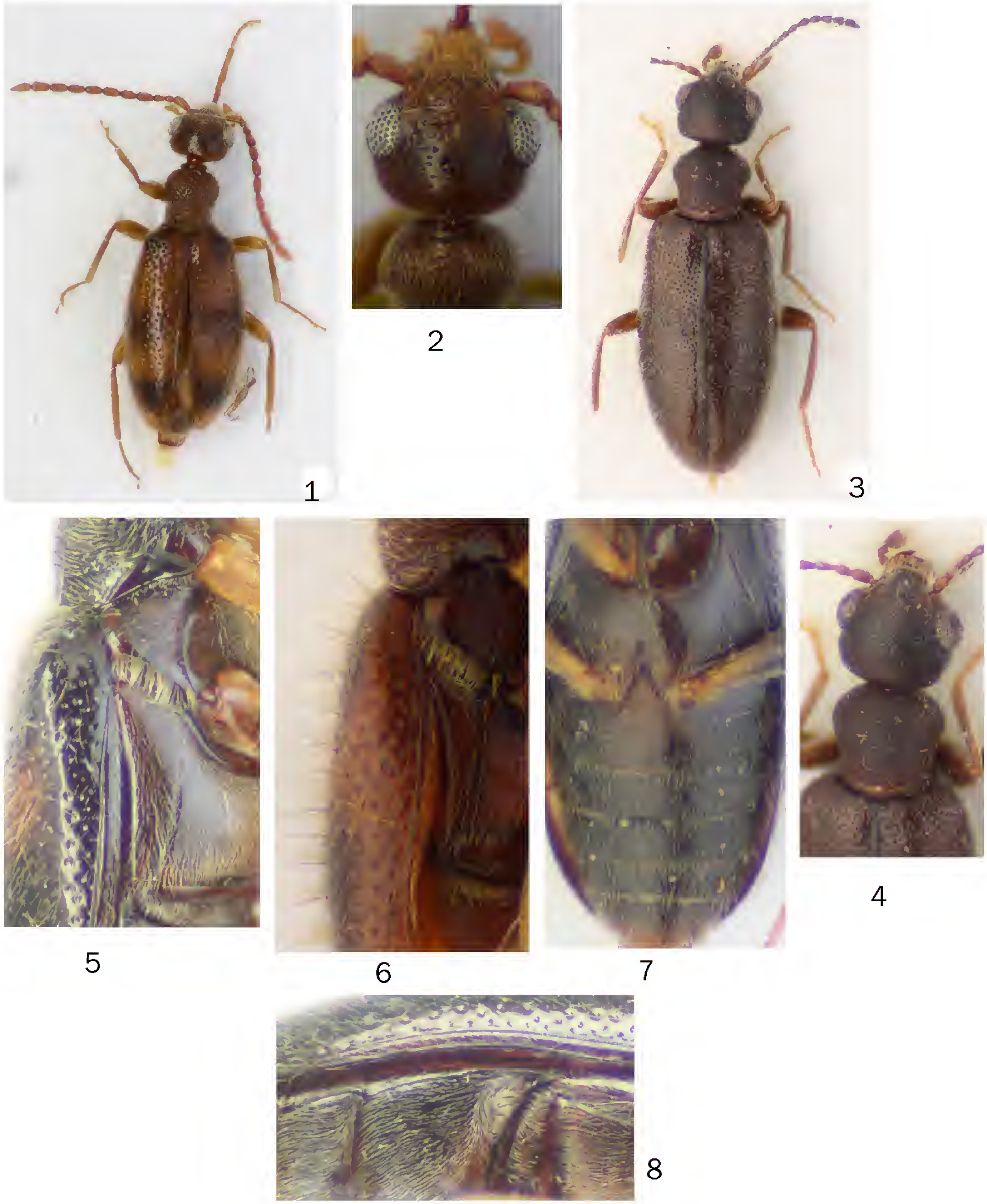
Plate 62



Figures 1-9. Oriental *Sapintus*, habitus and head / forebody, dorsal view. 1-2 – *S. lao* sp. nov., paratype ♂; 3-4 – *S. marseuli* (Pic, 1892), ♀ from N Vietnam; 5 – *S. pilipennis* (Pic, 1952), holotype; 6-7 – *S. pollocki* Uhmann, 1999, ♂ from Queensland; 8-9 – *S. subopaciceps* (Pic, 1913), ♂ from Indonesian Kalimantan.

Plate 63

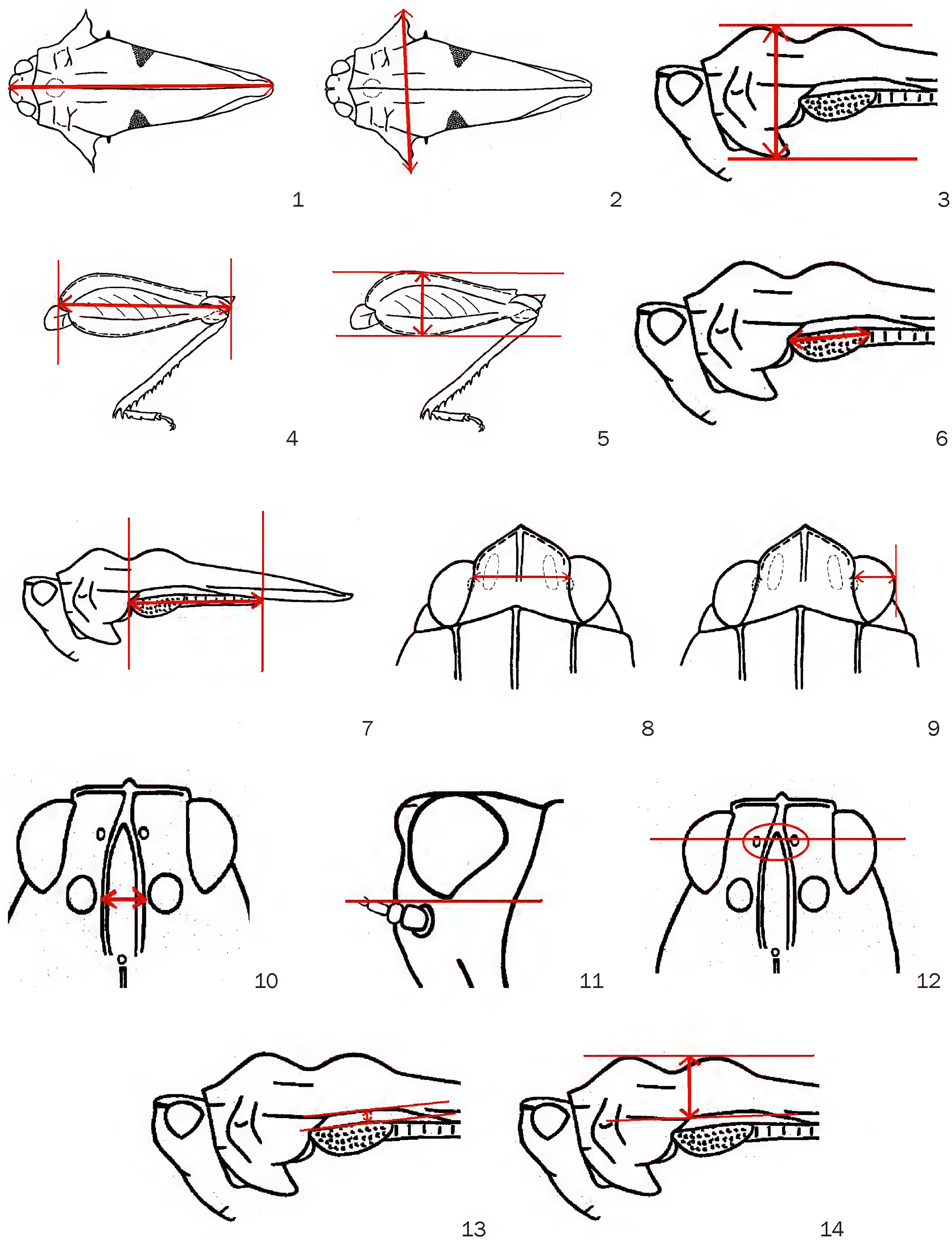
TELNOV, D.: Taxonomic revision of the genus *Sapintus* Casey, 1895 (Coleoptera: Anthicidae: Anthicinae) ...



Figures 1-8. Oriental and Indo-Australian *Sapintus*, habitus and head / forebody (dorsal view), abdomen (ventral & lateral view), meso- and metasternum (lateral view). 1-2 – *S. testaceicolor* (Pic, 1913), ♂ from Hong Kong; 3-4 – *S. vietnamensis* sp. nov., paratype ♂; 5 – *S. gracilicornis* (Pic, 1895), ♂ from Sabah, East Malaysia; 6 – *S. echinatus* sp. nov., paratype ♂; 7 – *S. dilensis* (Pic, 1900), ♂ from Waigeo Island; 8 – *S. gracilicornis* (Pic, 1895), ♂ from Sabah, East Malaysia.

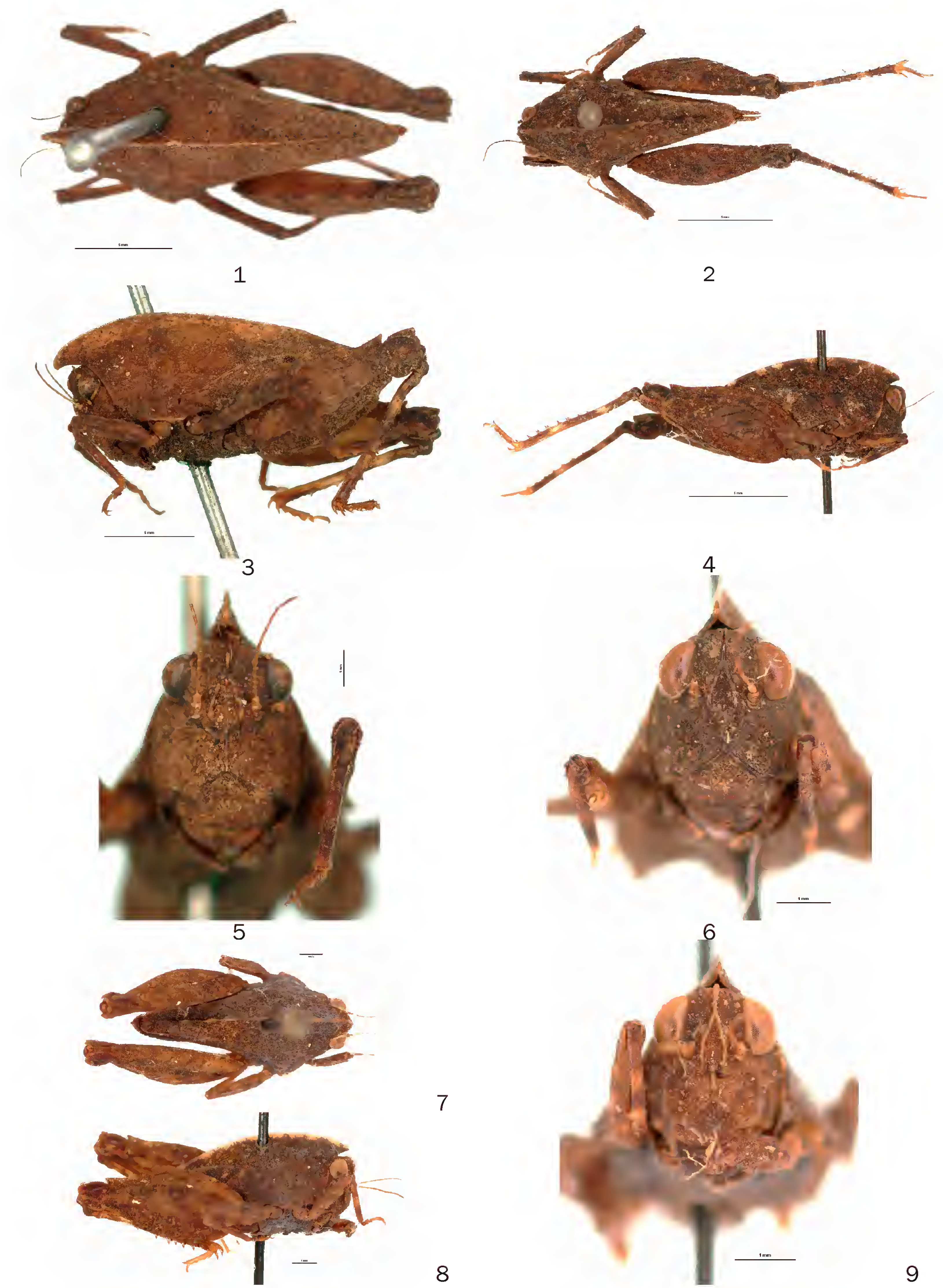
Plate 64

Tumbrinck, J.: Taxonomic revision of the Cladonotinae (Orthoptera: Tetrigidae) from the islands of South-East Asia ...



Figures 1-14. Measurements and characters of Tetrigidae.
1 – Pronotum length; 2 – Pronotum lobe width; 3 – Pronotum height (above the lateral lobes = new character); 4 – Postfemur length; 5 – Postfemur width; 6 – Tegmen length; 7 – Hind wing length; 8 – Vertex width; 9 – Eye width; 10 – Scutellum width; 11 – Position of the antennal grooves; 12 – Position of the furcation of the frontal costa and the superior ocelli; 13 - Infrascapular area height; 14 – Pronotum height (above the shoulders = old character).

Plate 65



Figures 1-9. *Boczkitettix* gen. nov., habitus and head. 1, 3, 5 – *Boczkitettix borneensis* (Günther, 1935) comb. nov., ♀ NHME; 2, 4, 6 – *Boczkitettix manokwariensis* (Günther, 1935) sp. nov., holotype ♀ BPBM; 7-9 – *B. manokwariensis* sp. nov., paratype ♂ (1/3) BPBM.

Plate 66

TUMBRINCK, J.: Taxonomic revision of the Cladonotinae (Orthoptera: Tetrigidae) from the islands of South-East Asia ...

Figures 1-7. *Bufonides antennatus* Bolívar, 1898, habitus, head and genitalia. 1, 3-5 – *B. antennatus*, paratype ♀ (1/3) MSNG (4– genitalia and antenna); 2, 6-7 – *B. antennatus*, holotype ♂ MSNG (2– genitalia).

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Figures 1-6. *Cladonotella beccarii* (Bolívar, 1898), habitus and head. 1, 3, 5 – *C. beccarii*, holotype ♀ MSNG; 2, 4, 6 – *C. insulana* Willemse, 1961 syn. nov. of *C. beccarii*, ♂ NCB-RMNH.

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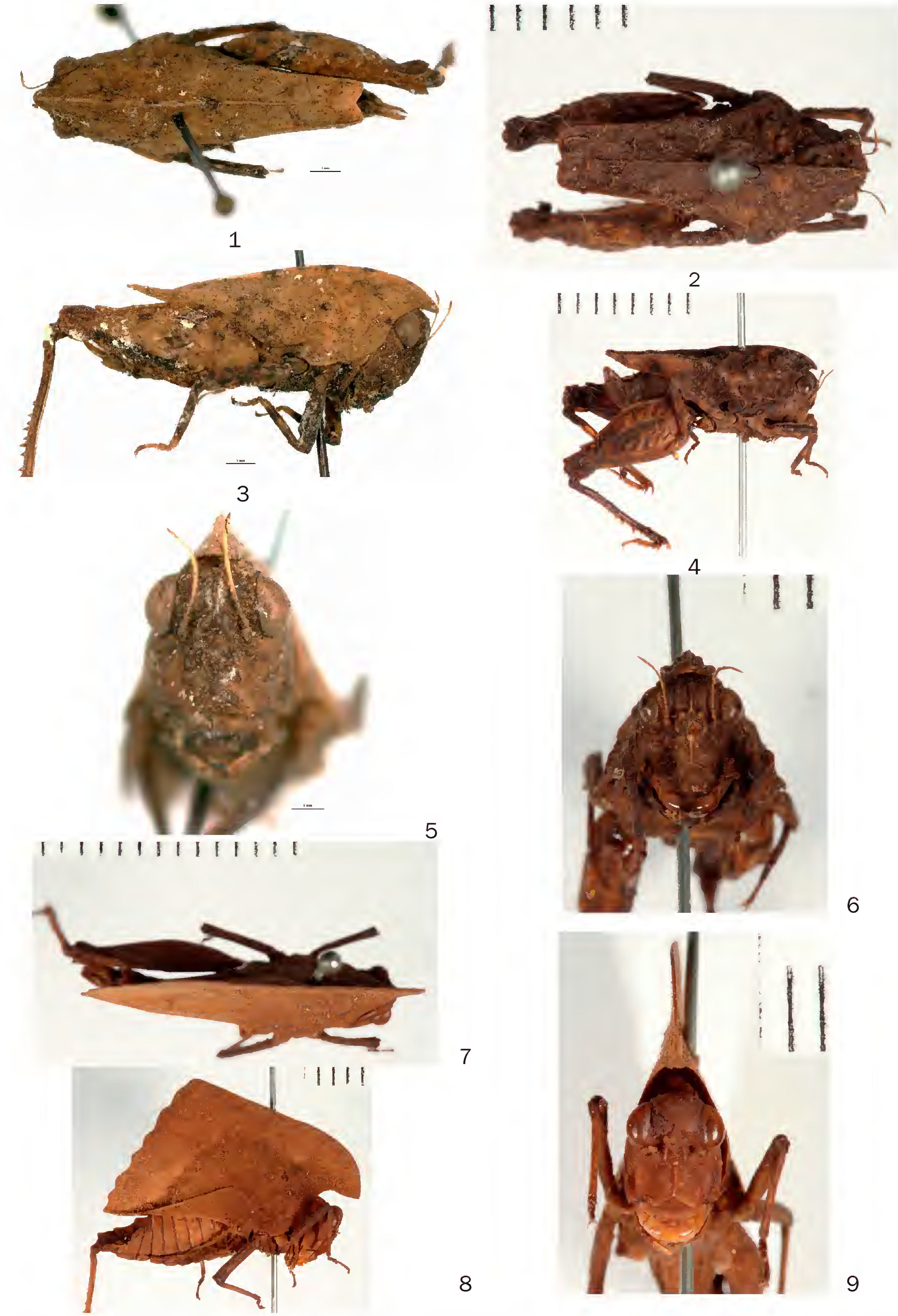
Figures 1-9. *Cladonotella gibbosa* (Haan, 1842) and *Cladonotella interrupta* (Bolívar, 1898), habitus and head. 1, 3, 5 – *C. gibbosa*, ♀ SMTD from G. Pantjar; 2, 4, 6 – *C. gibbosa*, ♂ ANSP; 7-9 – *C. interrupta*, holotype ♀ MSNG.

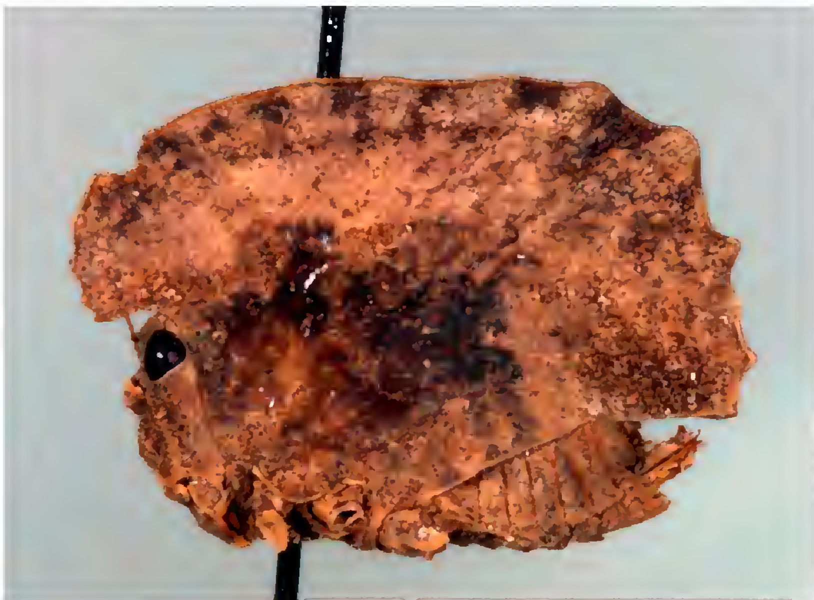
Figures 1-6. *Cladonotella riedeli* sp. nov. and *Devriesetettix dorreus* (Hancock, 1909), habitus and head. 1, 3, 5 – *C. riedeli* sp. nov., holotype ♀ ZSM; 2, 4, 6 – *D. dorreus*, holotype ♂ OUMNH.

Plate 70



Figures 1-9. *Diotarus* Stål, 1877 and *Hypsaeus westwoodi* Bolívar, 1887, habitus and head. 1, 3, 5 – *Diotarus ikonnikovi* Bey-Bienko, 1935, paratype ♂ NHME; 2, 4, 6 – *Diotarus verrucifer* Stål, 1877, holotype ♂ NHRS; 7-9 – *Hypsaeus westwoodi*, holotype ♂ NHRS.

Plate 71



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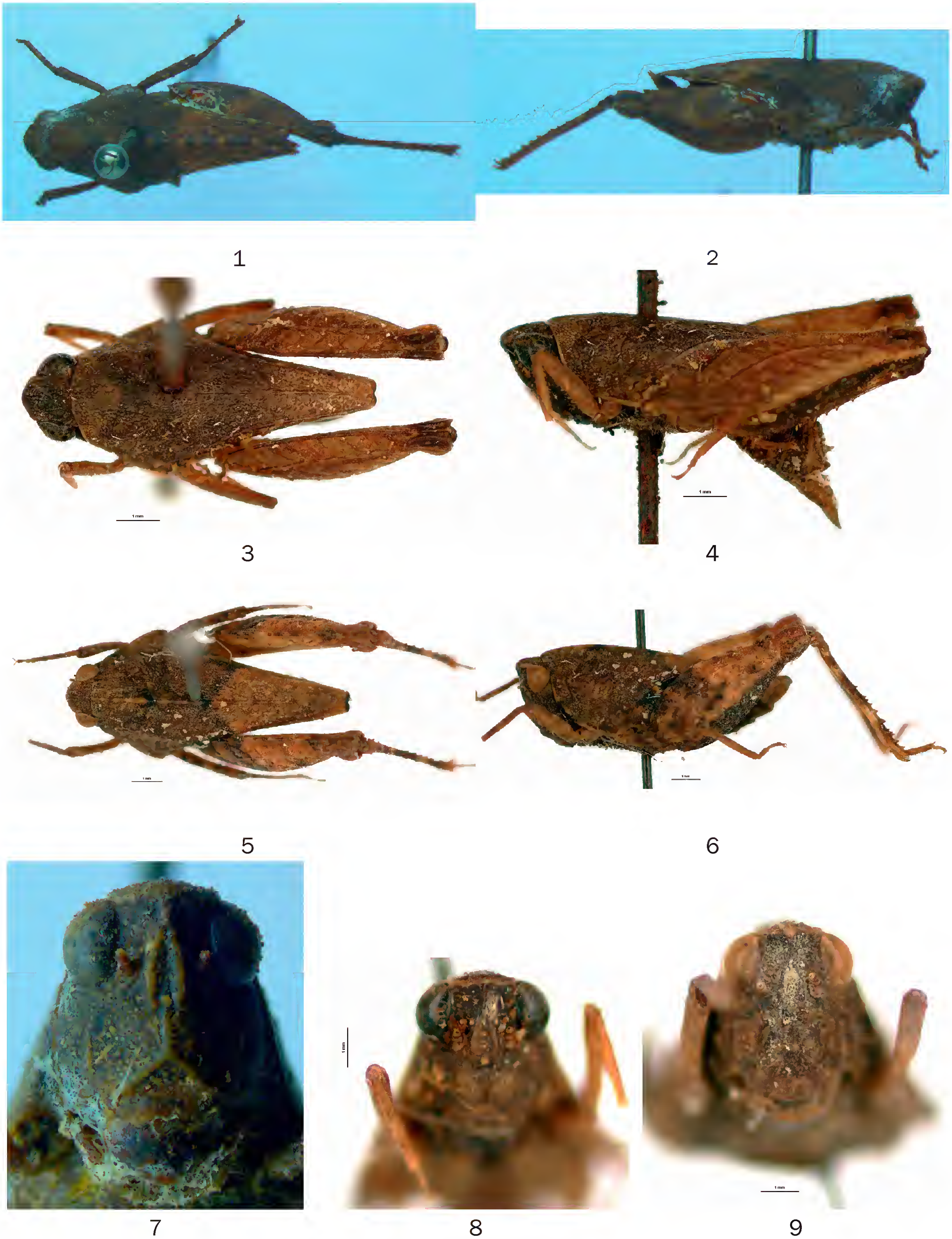
Figures 1-8. *Dolatettix* Hancock, 1907, habitus, head and abdomen. 1 – *D. spinifrons* Hancock, 1913, holotype ♀ ANSP (photo: J.D. Weintraub); 2 – *D. hochkirchi* sp. nov., paratype ♂ BPBM; 3, 5 – *D. lehmanni* sp. nov., holotype ♀ ZMHU (photo: S. Ingrisch); 4, 6, 8 – *D. hochkirchi* sp. nov., holotype ♀ BPBM; 7– *D. spinifrons*, ♀ UMB.

Plate 72



Figures 1-9. *Epitettix* Hancock, 1907, habitus and head. 1-2, 7 – *E. emarginatus* (Haan, 1842), holotype ♀ NCB-RMNH; 3-4, 8 – *E. emarginatus* (Haan, 1842), ♂ BPBM; 5-6, 9 – *E. humilicolus* Günther, 1938, ♀ ZMHU.

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Figures 1-6. *Eurymorphopus* Hancock, 1907. 1, 3, 5 – *E. bolivariensis* sp. nov., holotype ♀ MHNG; 2, 4, 6 – *E. cunctatus* (Bolívar, 1887), syntype ♂ IRSNB.

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Figures 1-10. *Gestroana* Berg, 1897, habitus in lateral view. 1 – *G. bicristulata* (Günther, 1938) comb. nov., holotype ♀ ZMHU (photo: S. Ingrisch); 2 – *G. baiyerriveriensis* sp. nov., holotype ♀ BPBM; 3 – *G. cyclopensis* sp. nov., holotype ♀ BPBM; 4 – *G. discoidea* Berg, 1898, holotype ♂ MSNG; 5 – *G. discoidea* Berg, 1898, paratype ♀ MNCN; 6 – *G. flasbarthi* sp. nov., holotype ♂ BPBM; 7 – *G. gressitti* sp. nov., holotype ♀ BPBM; 8 – *G. yapenensis* sp. nov., holotype ♀ BMNH; 9– *G. karimuiensis* sp. nov., holotype ♀ BPBM; 10 – *G. karimuiensis* sp. nov., paratype ♂ BPBM.

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Figures 1-8. *Gestroana* Berg, 1897, habitus in lateral view. 1 – *G. kleukersi* sp. nov., holotype ♀ NCB-RMNH; 2 – *G. moanemaniensis* sp. nov., holotype ♂ BPBM; 3 – *G. morobensis* sp. nov., holotype ♀ BPBM; 4 – *G. mounthagensis* sp. nov., holotype ♂ BPBM; 5 – *G. pannosa* sp. nov., holotype ♀ BPBM; 6 – *G. sedlaceki* sp. nov., holotype ♀ BPBM; 7 – *G. willemsei* sp. nov., holotype ♂ NCB-RMNH; 8 – *G. willemsei* sp. nov., paratype ♀ (1/9) NCB-RMNH.

Plate 76

Figures 1-9. *Gestroana* Berg, 1897, habitus in dorsal view. 1 – *G. baiyerriveriensis* sp. nov., holotype ♀ BPBM; 2 – *G. cyclopensis* sp. nov., holotype ♀ BPBM; 3 – *G. discoidea* Berg, 1898, holotype ♂ MSNG; 4 – *G. discoidea* Berg, 1898, paratype ♀ MNCN; 5 – *G. flasbarthi* sp. nov., holotype ♂ BPBM; 6 – *G. gressitti* sp. nov., holotype ♀ BPBM; 7 – *G. yapenensis* sp. nov., holotype ♀ BMNH; 8 – *G. karimuiensis* sp. nov., holotype ♀ BPBM; 9 – *G. karimuiensis* sp. nov., paratype ♂ BPBM.

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Figures 1-8. *Gestroana* Berg, 1897, habitus in dorsal view. 1 – *G. kleukersi* sp. nov., holotype ♀ NCB-RMNH; 2 – *G. moanemaniensis* sp. nov., holotype ♂ BPBM; 3 – *G. morobensis* sp. nov., holotype ♀ BPBM; 4 – *G. mounthagensis* sp. nov., holotype ♂ BPBM; 5 – *G. pannosa* sp. nov., holotype ♀ BPBM; 6 – *G. sedlaceki* sp. nov., holotype ♀ BPBM; 7 – *G. willemsei* sp. nov., holotype ♂ NCB-RMNH; 8 – *G. willemsei* sp. nov., paratype ♀ (1/9) NCB-RMNH.

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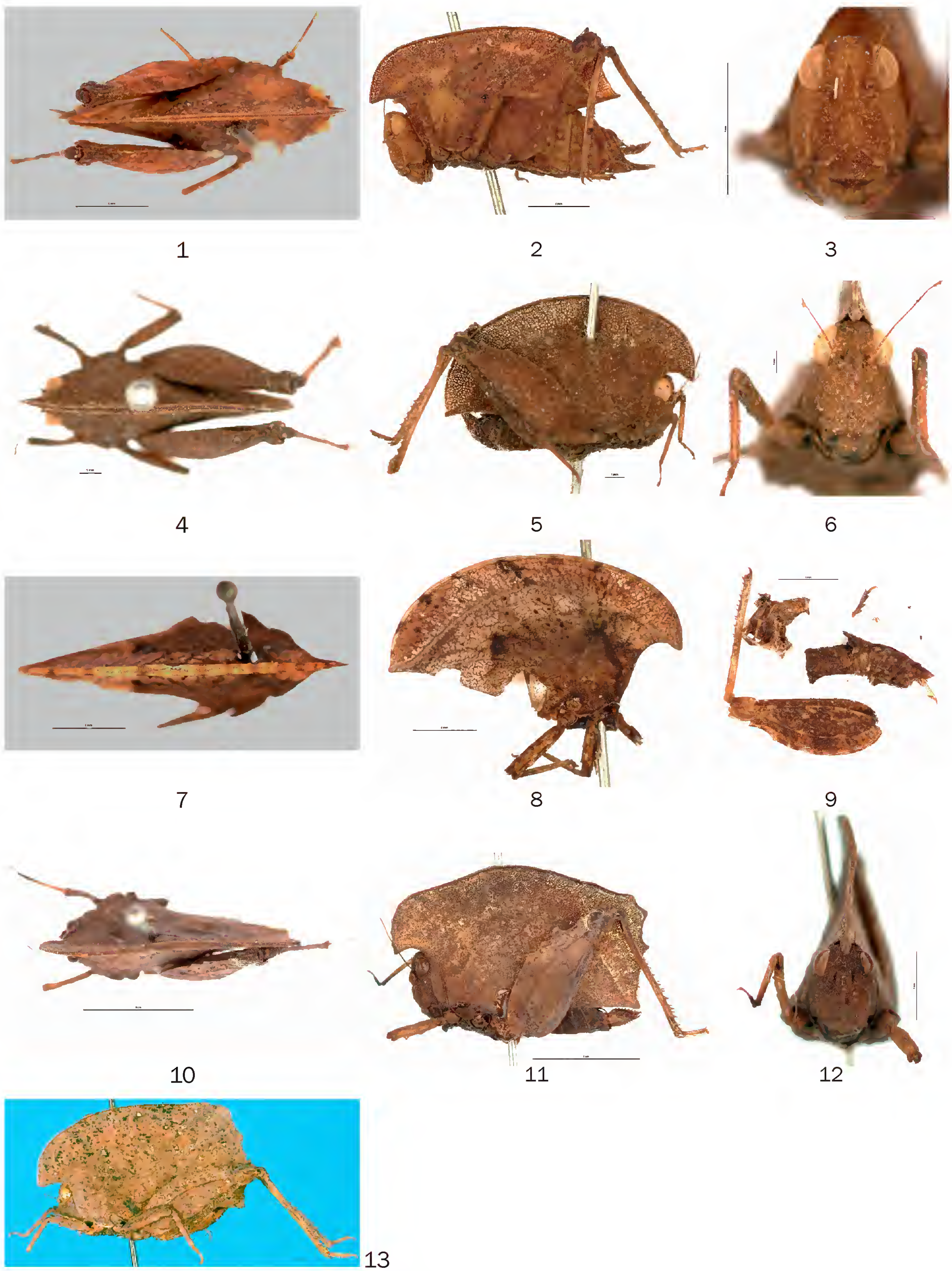
Figures 1-9. *Gestroana* Berg, 1897, head in frontal view. 1 – *G. baiyerriveriensis* sp. nov., holotype ♀ BPBM; 2 – *G. cyclopensis* sp. nov., holotype ♀ BPBM; 3 – *G. discoidea* Berg, 1898, holotype ♂ MSNG; 4 – *G. discoidea* Berg, 1898, paratype ♀ MNCN; 5 – *G. flasbarthi* sp. nov., holotype ♂ BPBM; 6 – *G. gressitti* sp. nov., holotype ♀ BPBM; 7 – *G. yapenensis* sp. nov., holotype ♀ BMNH; 8 – *G. karimuiensis* sp. nov., holotype ♀ BPBM; 9– *G. karimuiensis* sp. nov., paratype ♂ BPBM.

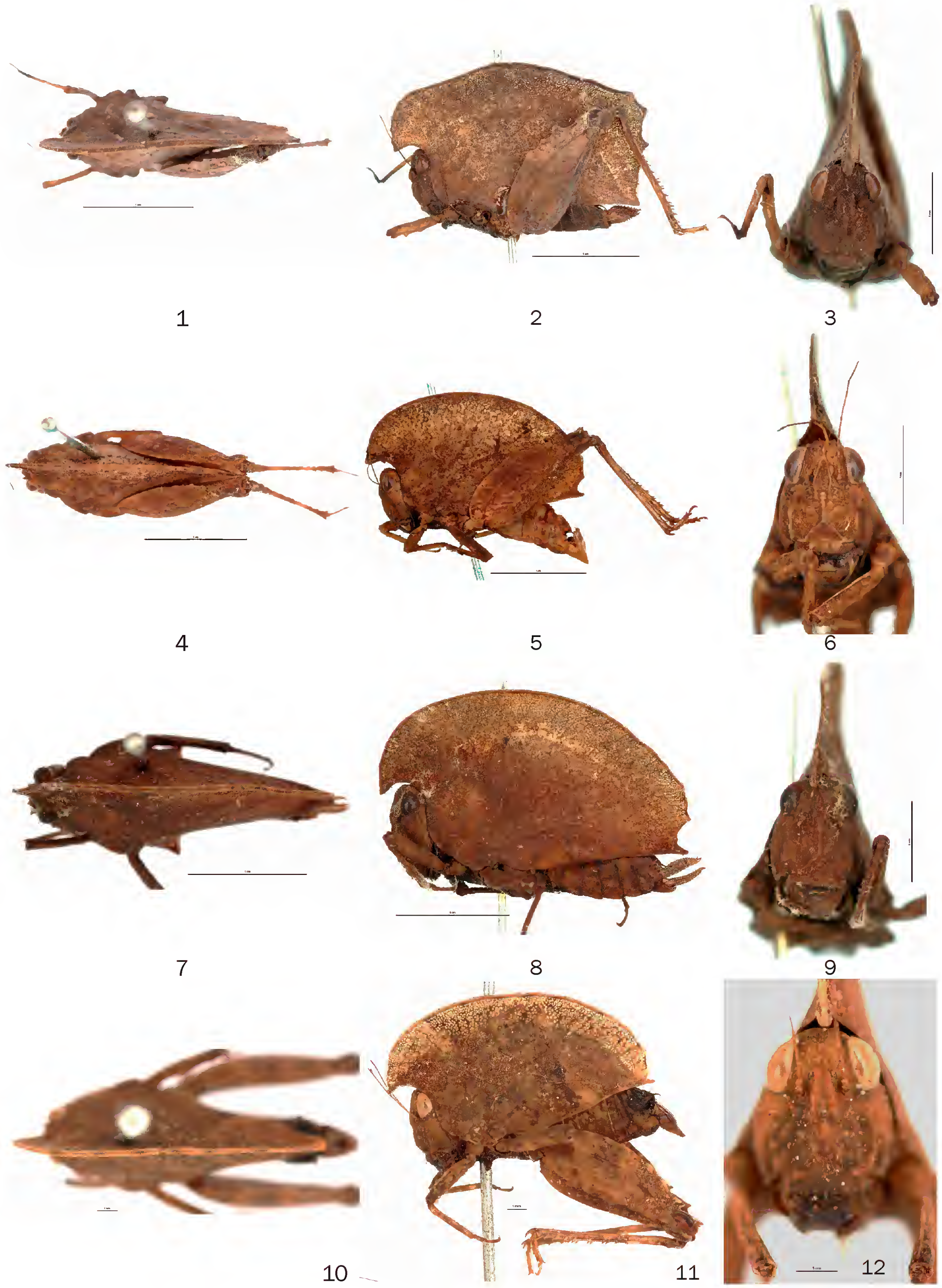
Figures 1-9. *Gestroana* Berg, 1897, head in frontal view and legs. 1 – *G. kleukersi* sp. nov., holotype ♀ NCB-RMNH; 2 – *G. moanemaniensis* sp. nov., holotype ♂ BPBM; 3 – *G. morobensis* sp. nov., holotype ♀ BPBM; 4 – *G. mounthagensis* sp. nov., holotype ♂ BPBM; 5 – *G. pannosa* sp. nov., holotype ♀ BPBM; 6 – *G. sedlaceki* sp. nov., holotype ♀ BPBM; 7 – *G. willemsei* sp. nov., holotype ♂ NCB-RMNH; 8 – *G. willemsei* sp. nov., paratype ♀ (1/9) NCB-RMNH; 9 – *G. kleukersi* sp. nov., holotype ♀ NCB-RMNH.

Plate 80



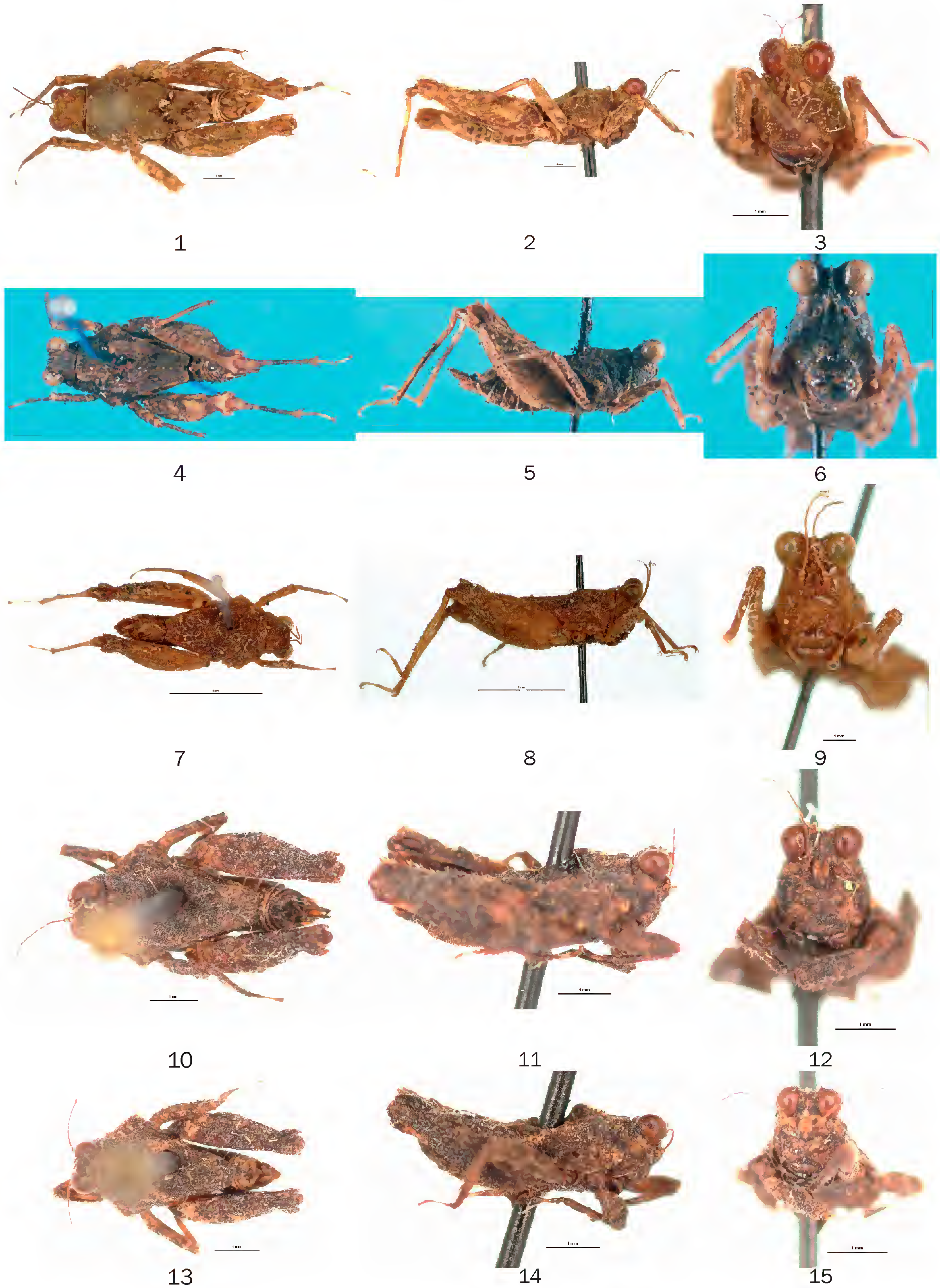
Figures 1-13. *Holoarcus* Hancock, 1909, habitus in dorsal and lateral view, head, abdomen and legs. 1-3 – *H. altinotus* Hancock, 1909, holotype ♀ OUMNH; 4-6 – *H. arcuatus* (Haan, 1842), paralectotype ♂ NCB-RMNH; 7-9 – *H. arcuatus* (Haan, 1842), lectotype ♀ OUMNH; 10-12 – *H. ferwillemsei* (Willemse, 1932) nom. nov., holotype ♂ IRSNB; 13 – *H. belingae* (Günther, 1929), holotype ♂ ZMHU (photo: S. Ingrisch).

Plate 81



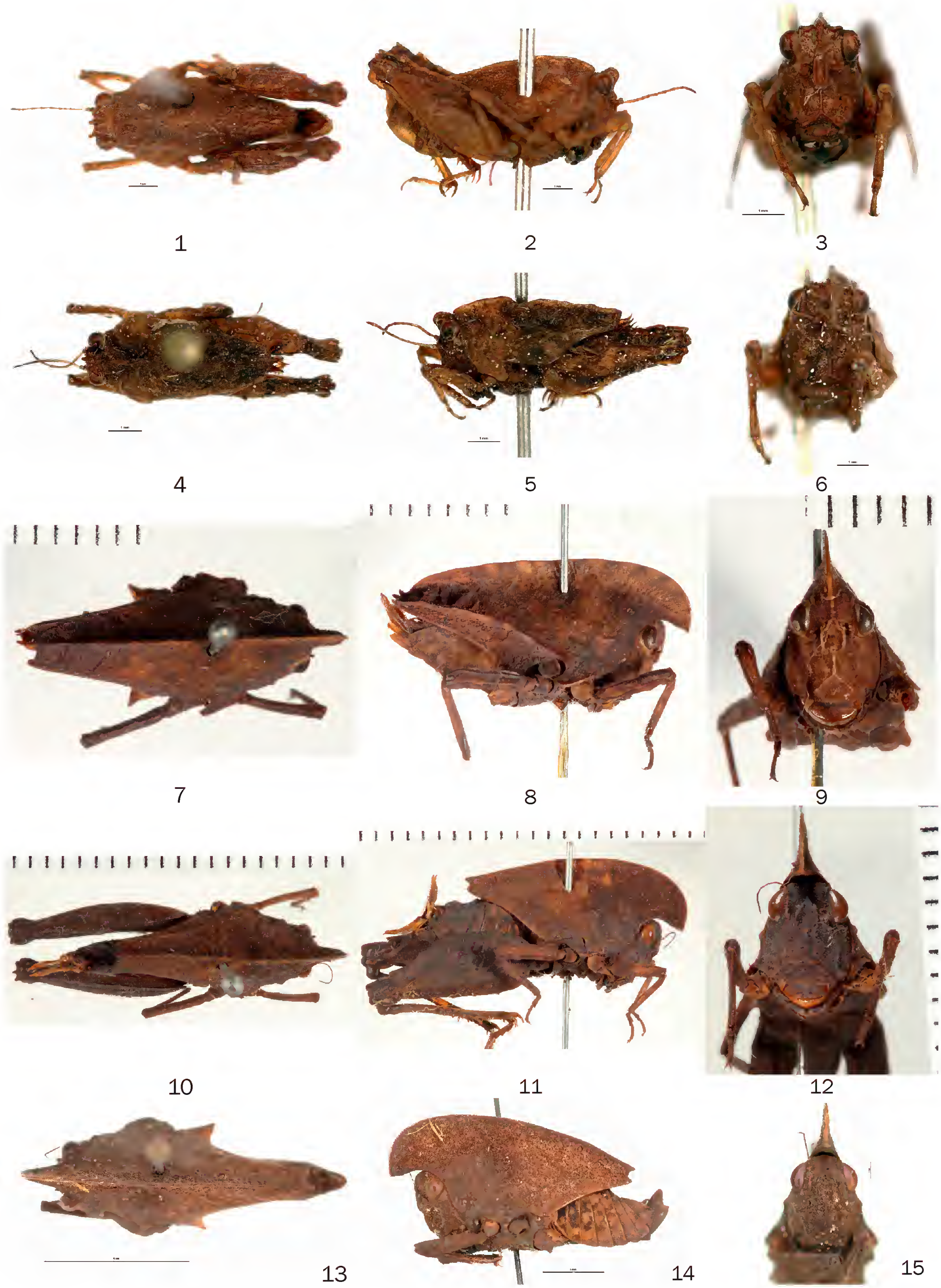
Figures 1-12. *Holoarcus* Hancock, 1909, habitus in dorsal and lateral view, head. 1-3 – *H. ferwillemsei* (Willemse, 1932) nom. nov., paratype ♀ IRSNB; 4-6 – *H. intermedius* (Willemse, 1932) comb. nov., holotype ♂ IRSNB; 7-9 – *H. intermedius* (Willemse, 1932) comb. nov., paratype ♀ IRSNB; 10-12 – *H. truncatus* (Hancock, 1909) comb. nov., holotype ♂ OUMNH.

Plate 82



Figures 1-15. *Ichikawatettix* gen. nov., habitus in dorsal and lateral view and head. 1-3 – *I. detzeli* sp. nov., holotype ♂ BPBM; 4-6 – *I. exsertus* (Günther, 1938), holotype ♀ ZMHU (photo: S. Ingrisch); 7-9 – *I. exsertus* (Günther, 1938), ♂ ZMHU; 10-12 – *I. kleinertae* sp. nov., holotype ♀ BPBM; 13-15 – *I. kleinertae* sp. nov., paratype ♂ BPBM.

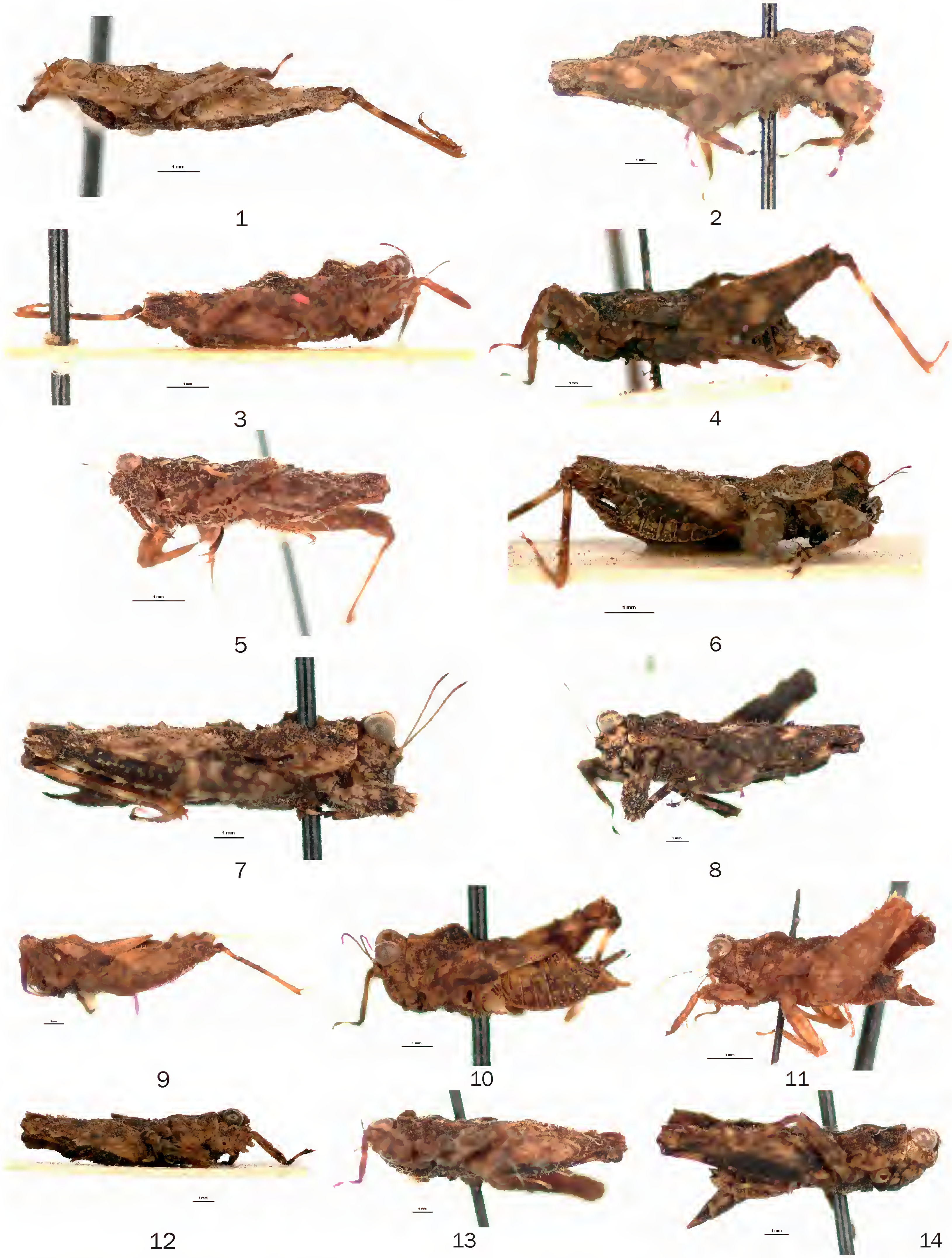
Figures 1-12. *Misythus* Stål, 1877, habitus in dorsal and lateral view and head. 1-3 – *M. echinatus* (Stål, 1877), holotype ♂ NHRS; 4-6 – *M. histrionicus* Stål, 1877 (synonym of *M. securifer* (Walker, 1871)), holotype ♂ NHRS; 7-9 – *M. histrionicus* Stål, 1877 (synonym of *M. securifer* (Walker, 1871)), allotype ♀ NHRS; 10-12 – *M. laminatus laminatus* Stål, 1877, holotype ♂ NHRS.



Figures 1-15. *Ingrischitettix mountalbilalaensis* sp. nov. and *Piezotettix* Bolívar, 1887, habitus in dorsal and lateral view and head. 1-3 – *I. mountalbilalaensis* sp. nov., holotype ♂ BPBM; 4-6 – *I. mountalbilalaensis* sp. nov., paratype ♀ BPBM; 7-9 – *Piezotettix cultratus* (Stål, 1877), holotype ♀ NHRS; 10-12 – *P. sulcatus* (Stål, 1877) comb. nov., holotype ♀ NHRS; 13-15 – *P. sulcatus* (Bolívar, 1887) comb. nov., ♂ NCB-RMNH.

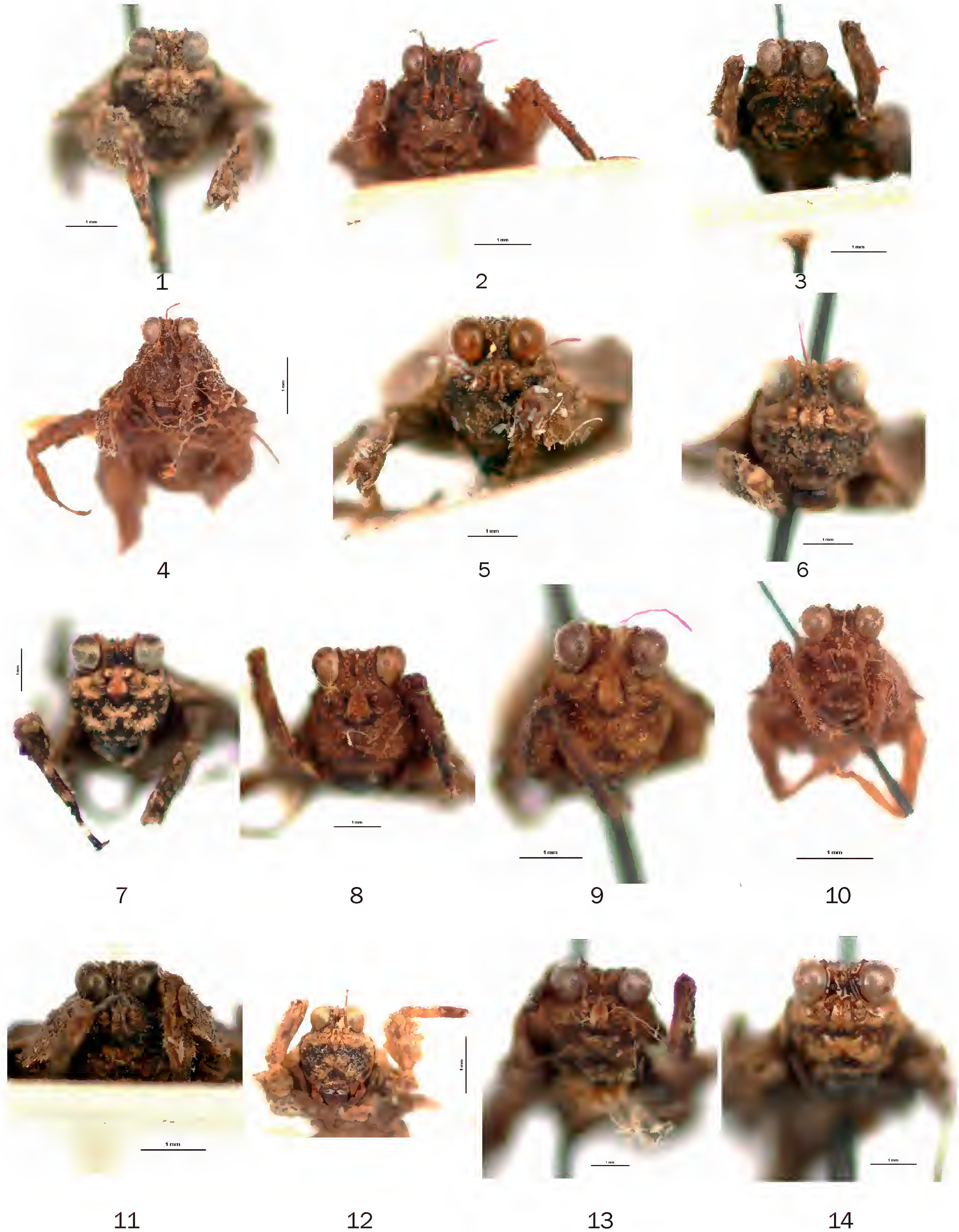
Plate 85

Figures 1-14. *Planotettix* gen. nov., habitus in dorsal view. 1 – *P. astrolabebayensis* sp. nov., holotype ♀ HNHM; 2 – *P. biroi* sp. nov., holotype ♀ BPBM; 3 – *P. buergersi* sp. nov., holotype ♂ ZMHU; 4 – *P. cyclopensis* sp. nov., holotype ♂ BPBM; 5 – *P. cyclopensis* sp. nov., paratype ♀ (3/10) BMNH; 6 – *P. fartmanni* sp. nov., holotype ♀ UCDC; 7 – *P. fartmanni* sp. nov., paratype ♂ (3/6) UCDC; 8 – *P. karubakensis* sp. nov., holotype ♀ BPBM; 9 – *P. maai* sp. nov., holotype ♀ BPBM; 10 – *P. maai* sp. nov., paratype ♂ (1/1) BPBM; 11 – *P. mountbaduriensis* sp. nov., holotype ♀ BMNH; 12 – *P. planus* sp. nov., holotype ♂ BPBM; 13 – *P. riedei* sp. nov., holotype ♀ BPBM; 14 – *P. riedei* sp. nov., paratype ♂ (3/4) BPBM.



Figures 1-14. *Planotettix* gen. nov., habitus in lateral view. 1 – *P. planus* sp. nov., holotype ♂ BPBM; 2 – *P. astrolabebayensis* sp. nov., holotype ♀ HNHM; 3 – *P. biroi* sp. nov., holotype ♀ BPBM; 4 – *P. buergersi* sp. nov., holotype ♂ ZMHU; 5 – *P. cyclopensis* sp. nov., holotype ♂ BPBM; 6 – *P. cyclopensis* sp. nov., paratype ♀ (3/10) BMNH; 7 – *P. fartmanni* sp. nov., holotype ♀ UCDC; 8 – *P. fartmanni* sp. nov., paratype ♂ (3/6) UCDC; 9 – *P. karubakensis* sp. nov., holotype ♀ BPBM; 10 – *P. maai* sp. nov., holotype ♀ BPBM; 11 – *P. maai* sp. nov., paratype ♂ (1/1) BPBM; 12 – *P. mountbaduriensis* sp. nov., holotype ♀ BMNH; 13 – *P. riedei* sp. nov., holotype ♀ BPBM; 14 – *P. riedei* sp. nov., paratype ♂ (3/4) BPBM.

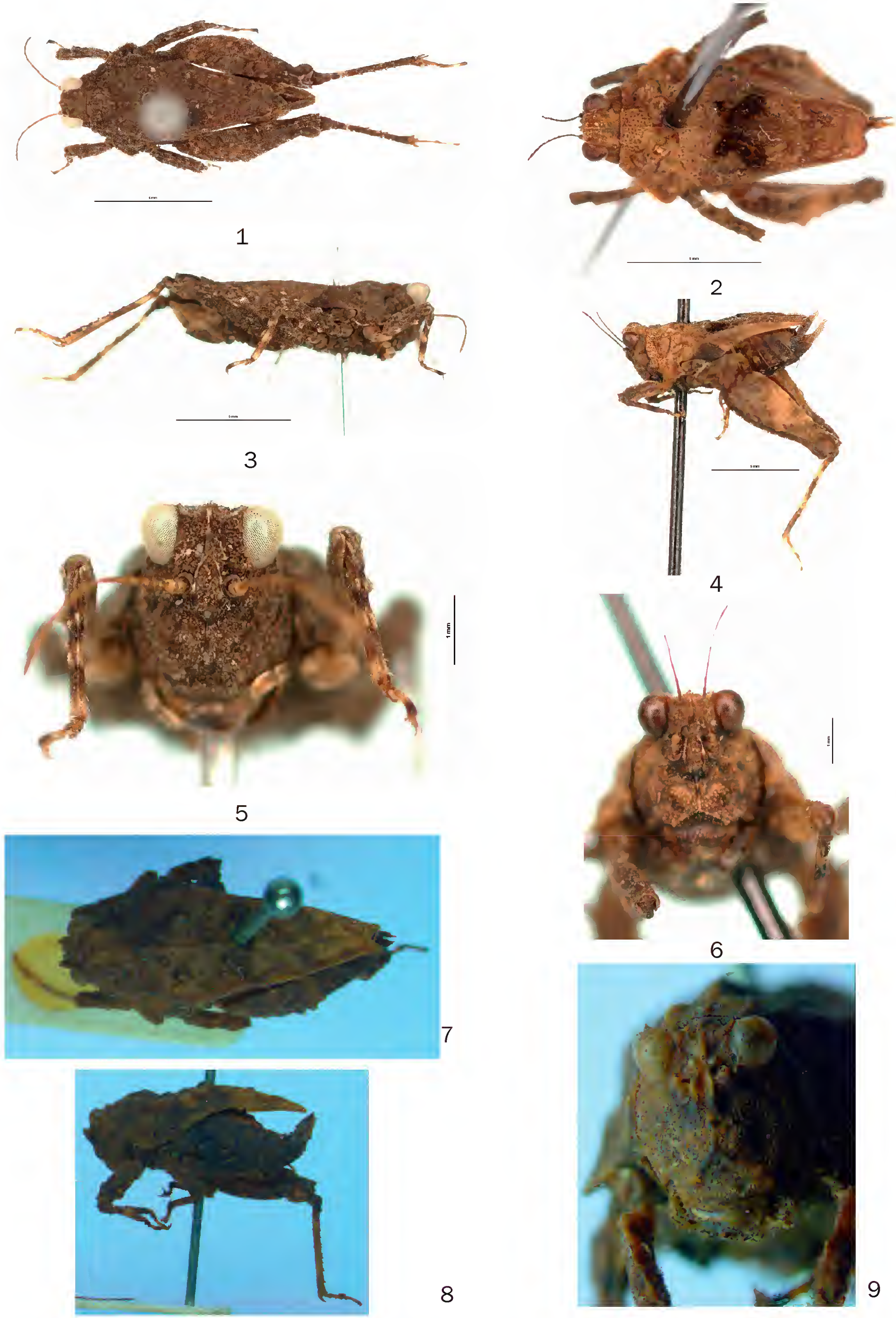
Plate 87



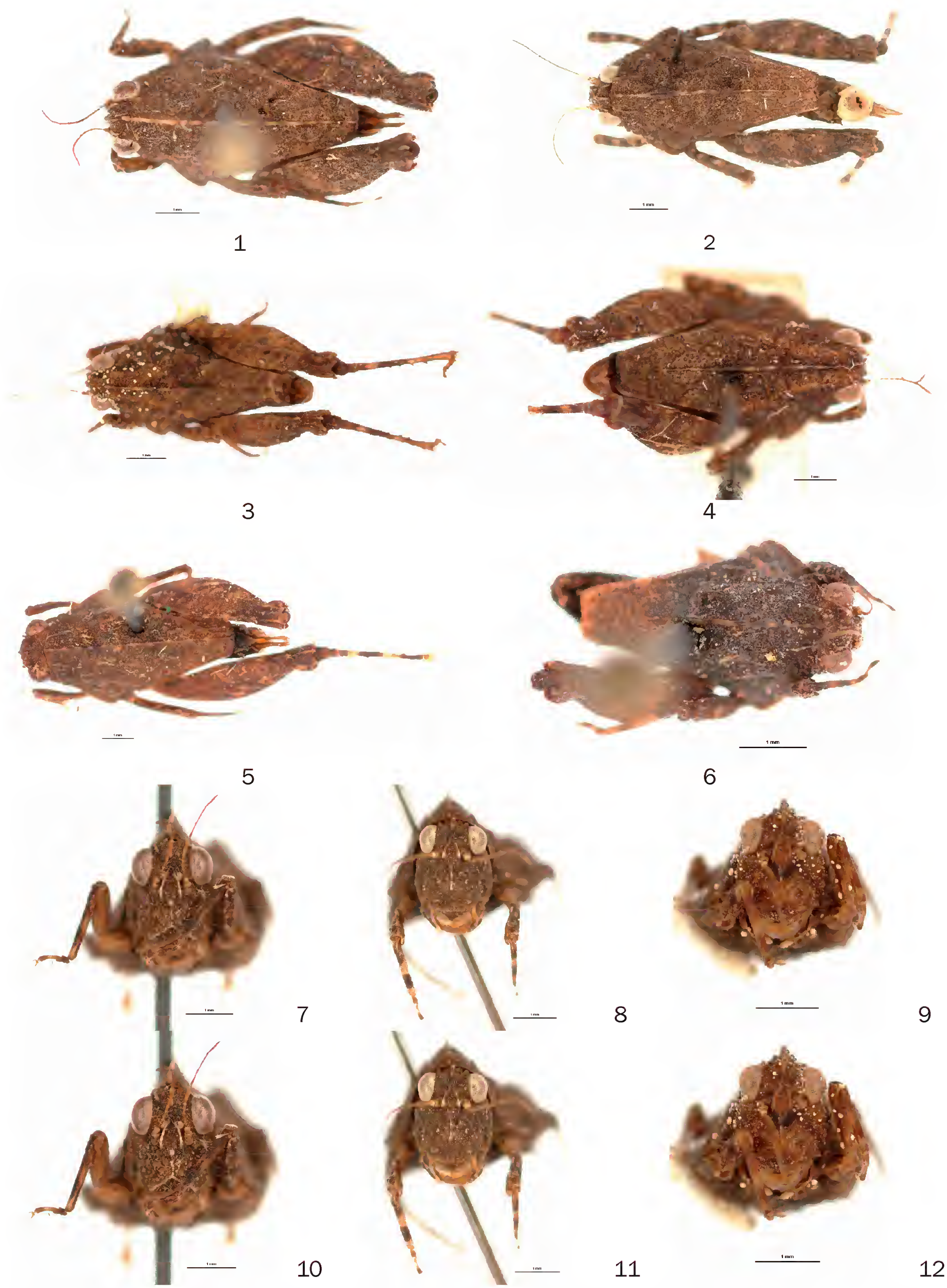
Figures 1-14. *Planotettix* gen. nov., head in frontal view. 1 – *P. astrolabebayensis* sp. nov., holotype ♀ HNHM; 2 – *P. biroi* sp. nov., holotype ♀ BPBM; 3 – *P. buergersi* sp. nov., holotype ♂ ZMHU; 4 – *P. cyclopensis* sp. nov., holotype ♂ BPBM; 5 – *P. cyclopensis* sp. nov., paratype ♀ (3/10) BMNH; 6 – *P. fartmanni* sp. nov., holotype ♀ UCDC; 7 – *P. fartmanni* sp. nov., paratype ♂ (3/6) UCDC; 8 – *P. karubakensis* sp. nov., holotype ♀ BPBM; 9 – *P. maai* sp. nov., holotype ♀ BPBM; 10 – *P. maai* sp. nov., paratype ♂ (1/1) BPBM; 11 – *P. mountbaduriensis* sp. nov., holotype ♀ BMNH; 12 – *P. planus* sp. nov., holotype ♂ BPBM; 13 – *P. riedei* sp. nov., holotype ♀ BPBM; 14 – *P. riedei* sp. nov., paratype ♂ (3/4) BPBM.

Figures 1-15. *Potua* Bolívar, 1887, *Pseudohyboella weylandiana* Günther, 1938 and *Stegaceps brevicornis* Hancock, 1913, habitus in dorsal and lateral view and head. 1-3 – *Potua coronata coronata* Bolívar, 1887, syntype ♂ NHRS; 4-6 – *P. coronata sumatrensis* Bolívar, 1898, ♂ SMTD; 7-9 – *P. sabulosa* Hancock, 1915, holotype ♂ ANSP (photo : J.D. Weintraub); 10-12 – *Pseudohyboella weylandiana* Günther, 1938, ♂ BPBM; 13-15 – *Stegaceps brevicornis* Hancock, 1913, holotype ♀ ANSP (photo: J.D. Weintraub).

Plate 89

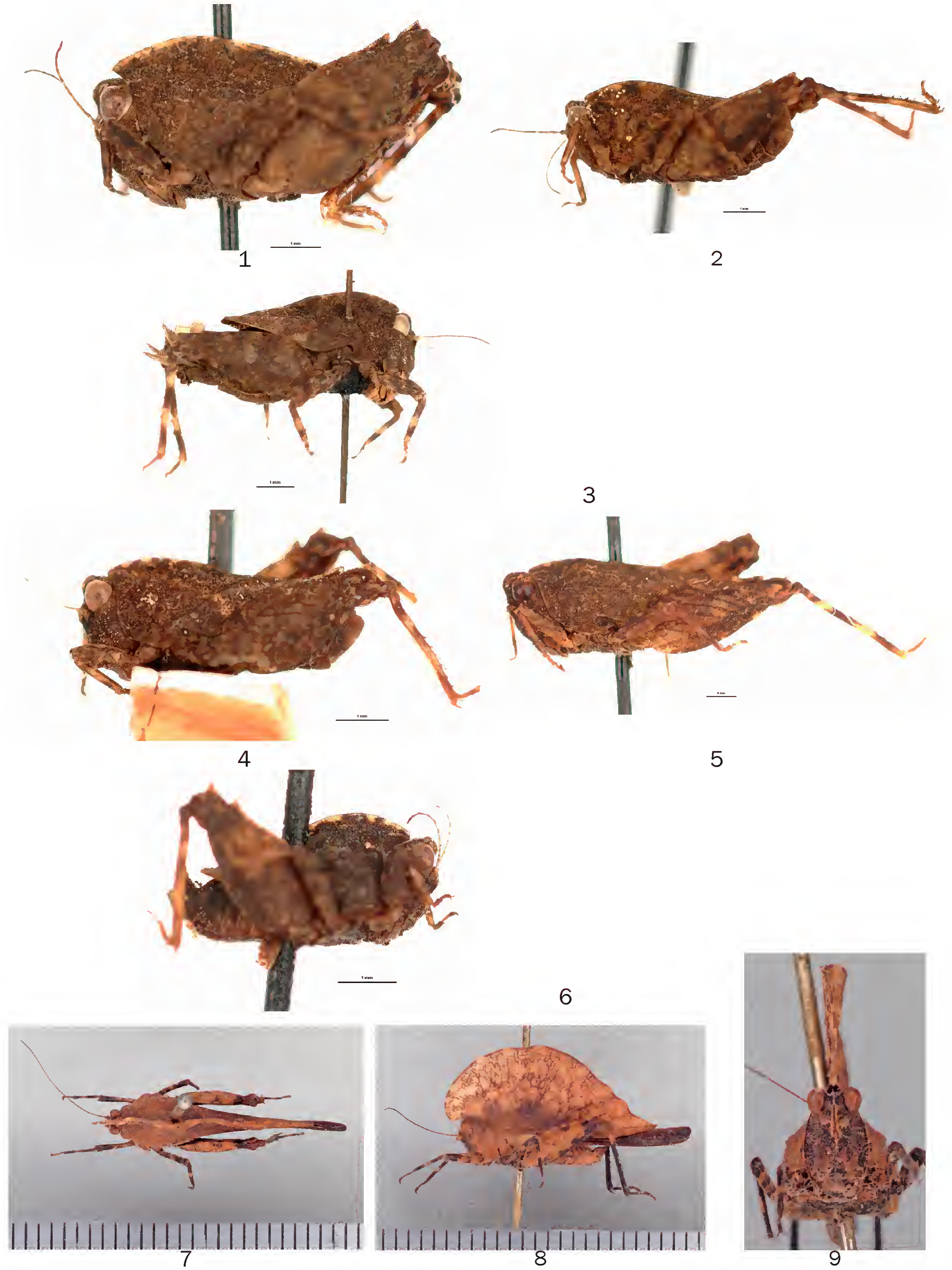


Figures 1-9. *Tepperotettix reliquia* Rehn, 1952 and *Tondanotettix brevis brevis* (Haan, 1842), habitus in dorsal and lateral view and head. 1, 3, 5 – *Tepperotettix reliquia*, ♂ MHNG; 2, 4, 6 – *Tepperotettix reliquia*, ♀ AMS; 7-9 – *Tondanotettix brevis brevis* (Haan, 1842), holotype ♀ NCB-RMNH.



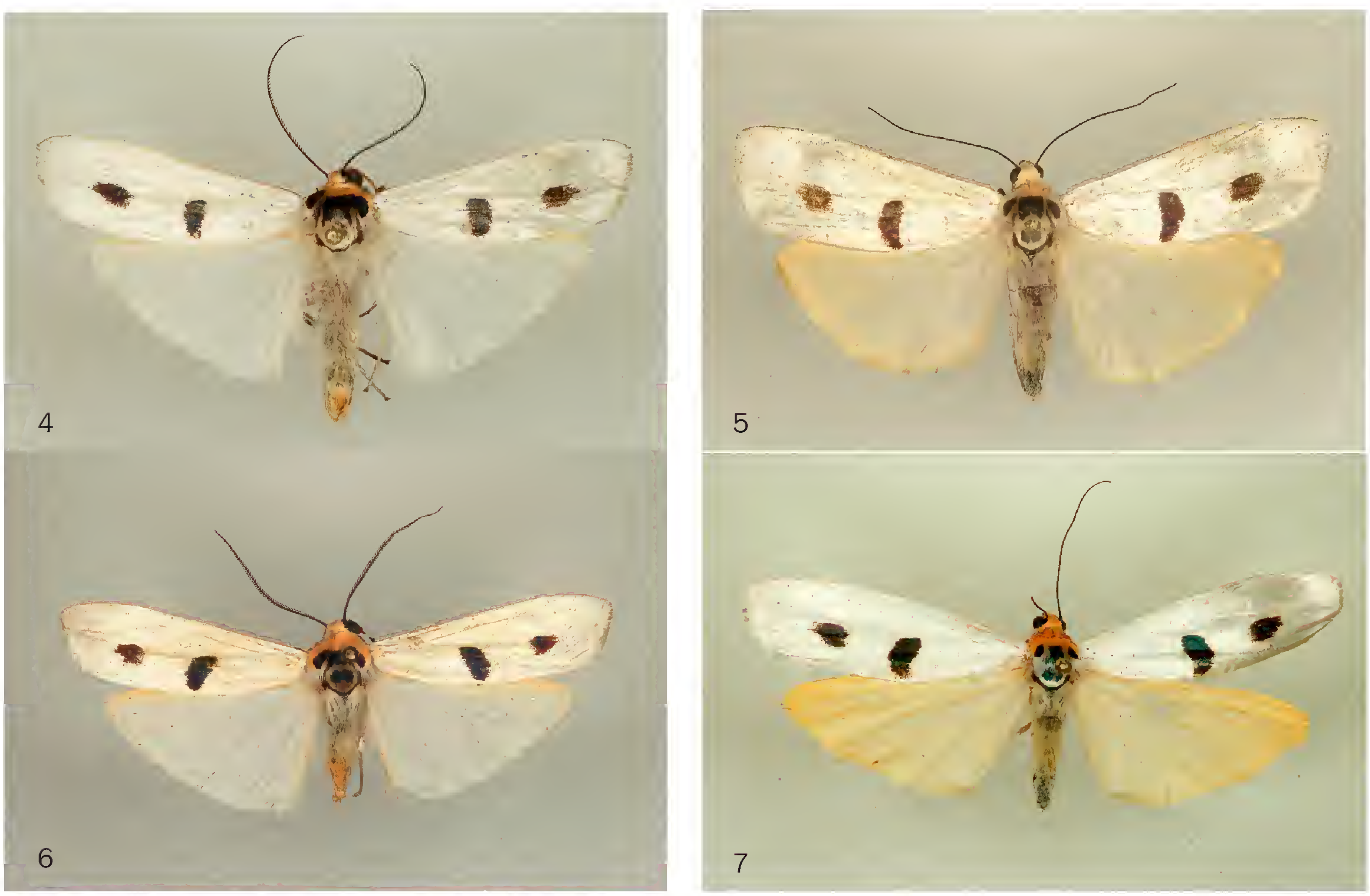
Figures 1-12. *Willemsetettix* gen. nov., habitus in dorsal view and head. 1, 7 – *W. laeensis* sp. nov., holotype ♀ BPBM; 2, 8 – *W. missai* sp. nov., holotype ♀ IRSNB; 3, 9 – *W. missai* sp. nov., paratype ♂ (5/5) BPBM; 4, 10 – *W. oriomoensis* sp. nov., holotype ♂ BPBM; 5, 11 – *W. wauensis* sp. nov., holotype ♀ BPBM; 6, 12 – *W. willemsei* sp. nov., holotype ♂ BPBM.

Plate 91



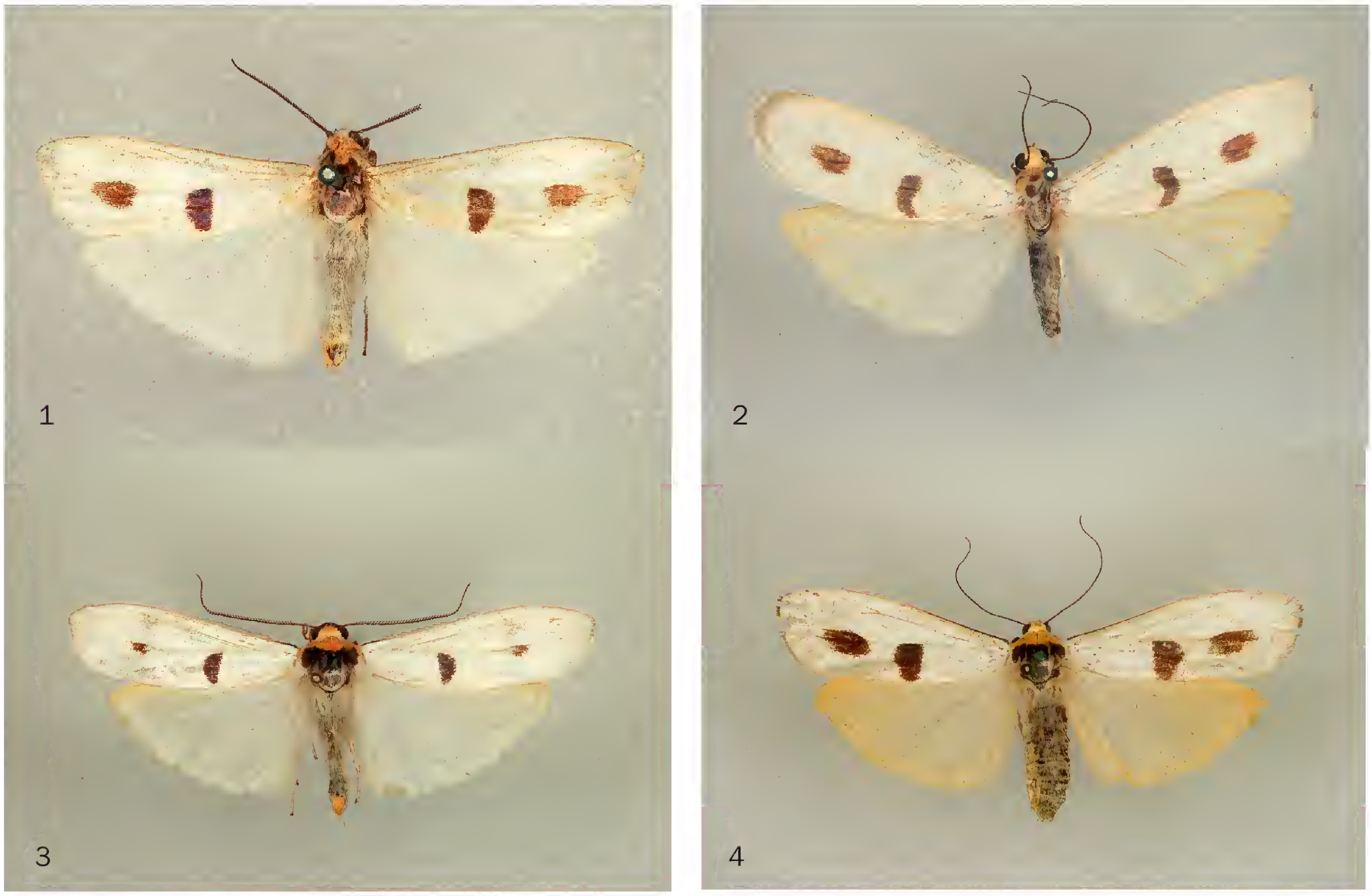
Figures 1-9. *Willemsetettix* gen. nov. and *Paraphyllum antennatum* Hancock, 1913, habitus in dorsal and lateral view and head. 1 – *W. laeensis* sp. nov., holotype ♀ BPBM; 2 – *W. missai* sp. nov., paratype ♂ (5/5) BPBM; 3 – *W. missai* sp. nov., holotype ♀ IRSNB; 4 – *W. oriomoensis* sp. nov., holotype ♂ BPBM; 5 – *W. wauensis* sp. nov., holotype ♀ BPBM; 6 – *W. willemsei* sp. nov., holotype ♂ BPBM; 7-9 – *P. antennatum* Hancock, 1913, holotype ♀ ANSP (photo: J.D. Weintraub).

Figures 1-3. Papuan *Monosyntaxis* species. 1-2: *M. bipunctata* (Bethune-Baker, 1904). 1 – ♂, Owgarra, Owen Stanley Range, Papua New Guinea (BMNH); 2 – ♀, Angabunga River, Papua New Guinea (BMNH); 3 – *M. kratkeensis* sp. nov., ♂ holotype, Bantibasa district, Kratke Mountains, Papua New Guinea (BMNH).

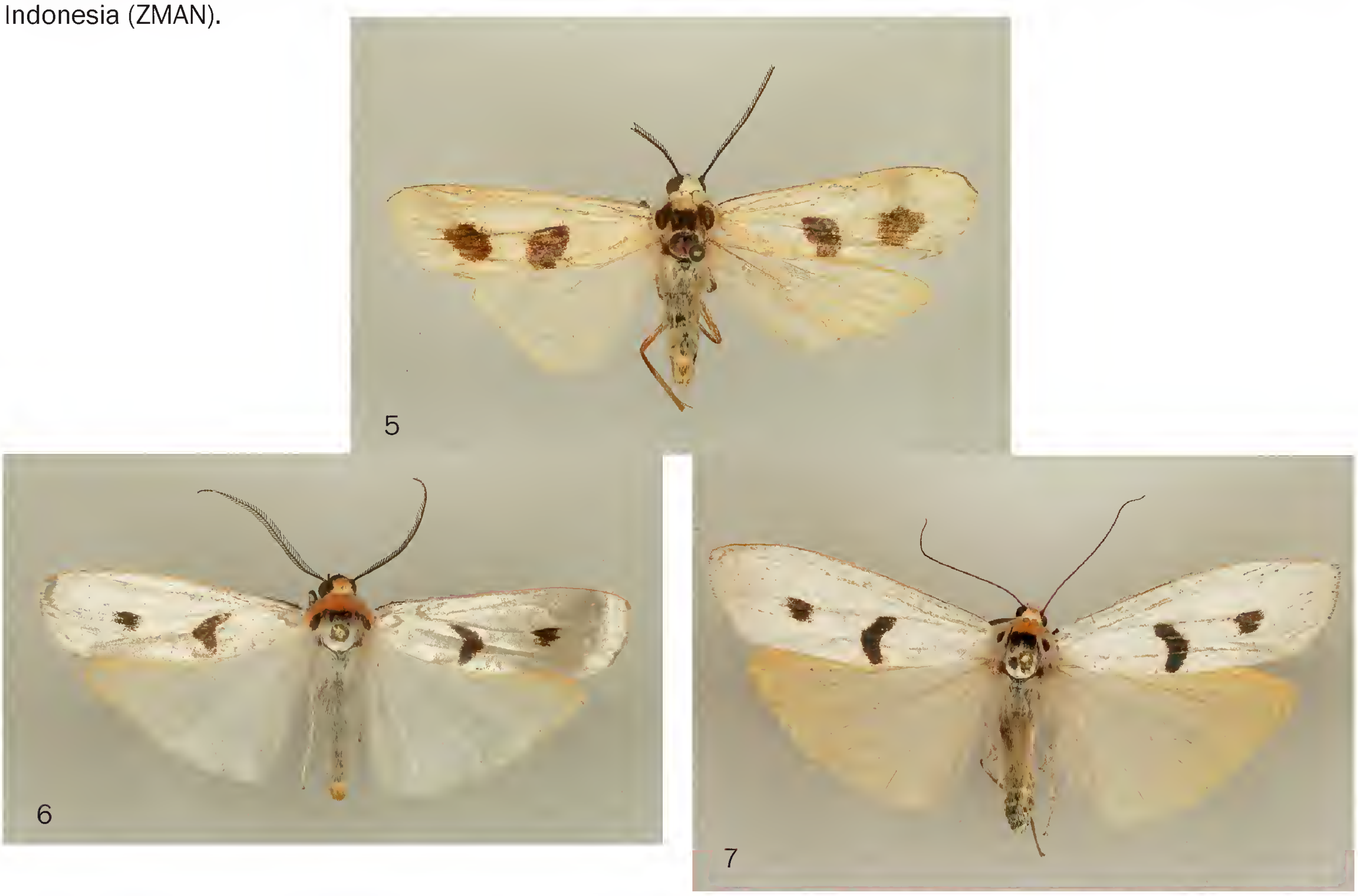


Figures 4-7. Papuan *Monosyntaxis* species. 4-5: *M. honeyi* sp. nov. 4 – ♂ holotype, Pass Valley, Jayawijaya mts., Papua, Indonesia (ZMAN); 5 – ♀ paratype, Walmak, Jayawijaya mts., Papua, Indonesia (ZMAN); 6-7: *M. fojaensis* sp. nov. 6 – ♂ holotype, Foja mts., Papua, Indonesia (ZMAN); 7 –♀ paratype, Foja Mountains, Papua, Indonesia (KSP).

Plate 93

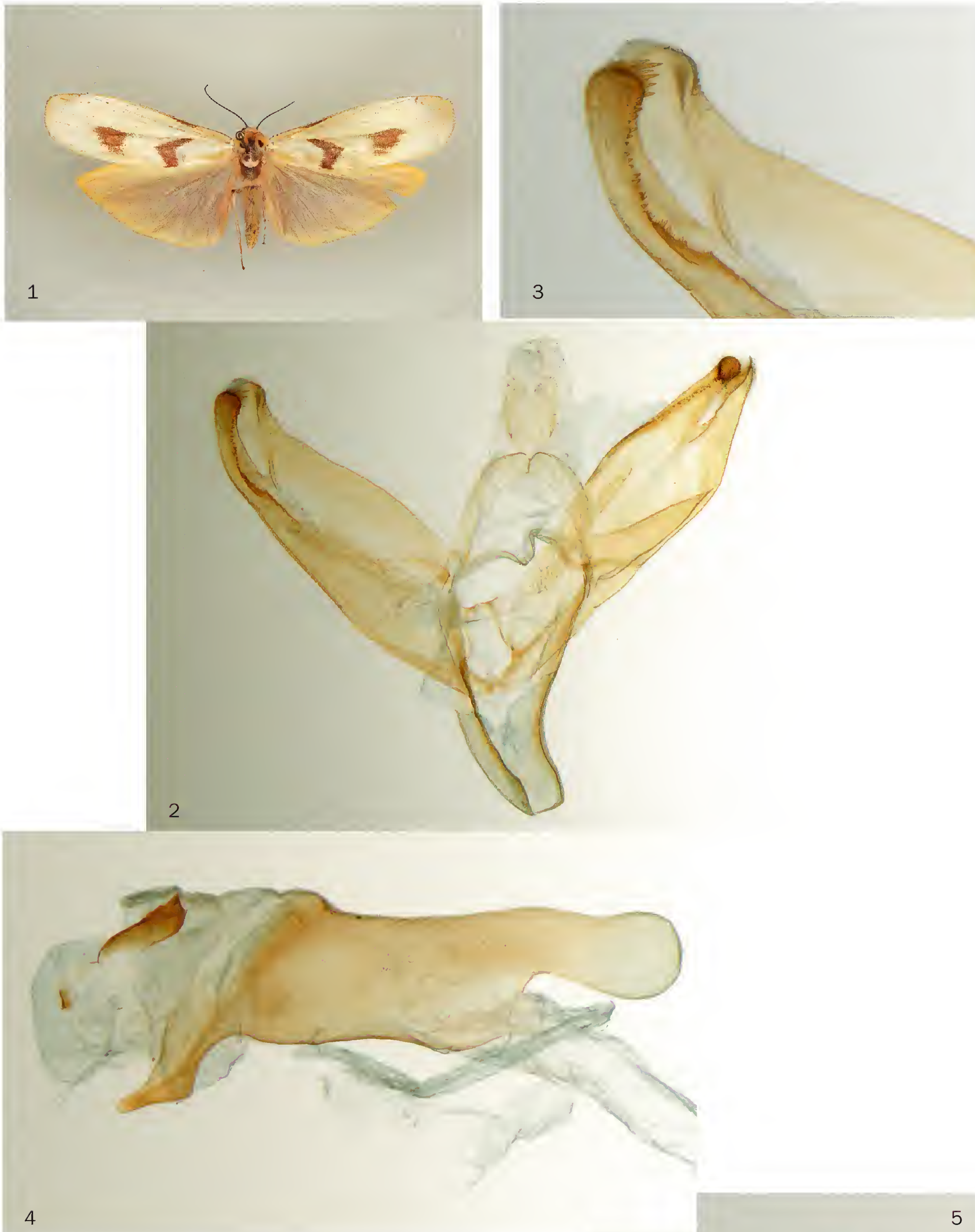


Figures 1-4. Papuan *Monosyntaxis* species. 1-2: *M. kobowrensis* sp. nov. 1 – ♂ paratype, Mt. Kunupi, Kobowre (Weyland) mts., Papua, Indonesia (BMNH); 2 – ♀ paratype, Paniai area, Papua, Indonesia (RMNH); 3-4: *M. arfakensis* sp. nov. 3 – ♂ holotype, Mokwam, Arfak mts., Papua, Indonesia (ZMAN); 4 – ♀ paratype, Mokwam, Arfak mts., Papua, Indonesia (ZMAN).



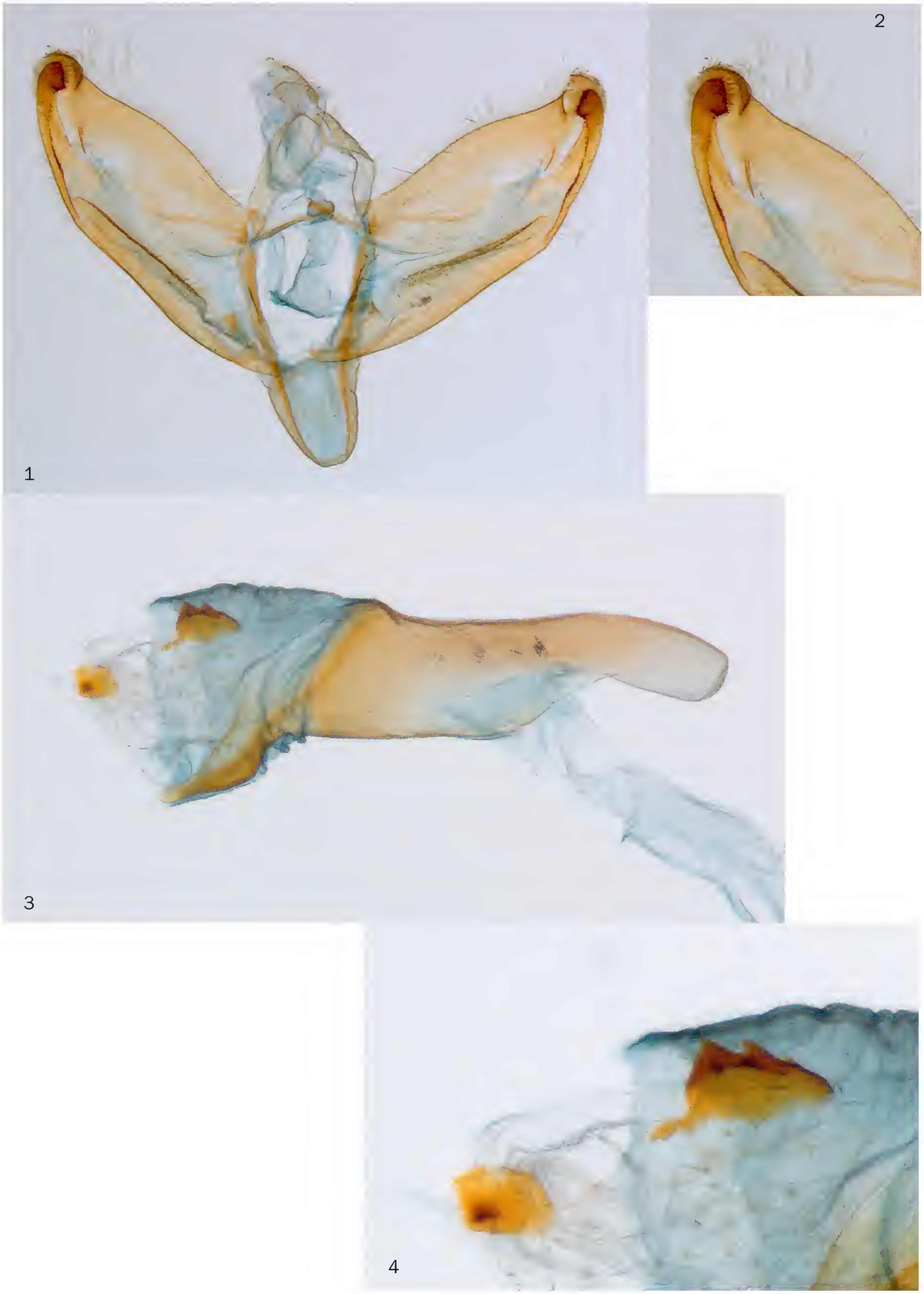
Figures 5-7. Papuan *Monosyntaxis* species. 5 – *M. bimaculata* De Vos, 2009. ♂ holotype, Kwerba, Foja mts., Papua, Indonesia (ZMAN); 6-7: *M. persimilis* Rothschild, 1912. 6 – ♂, Pass Valley, Jayawijaya mts., Papua, Indonesia (ZMAN); 7 – ♀, Pass Valley, Jayawijaya mts., Papua, Indonesia (ZMAN).

Plate 94



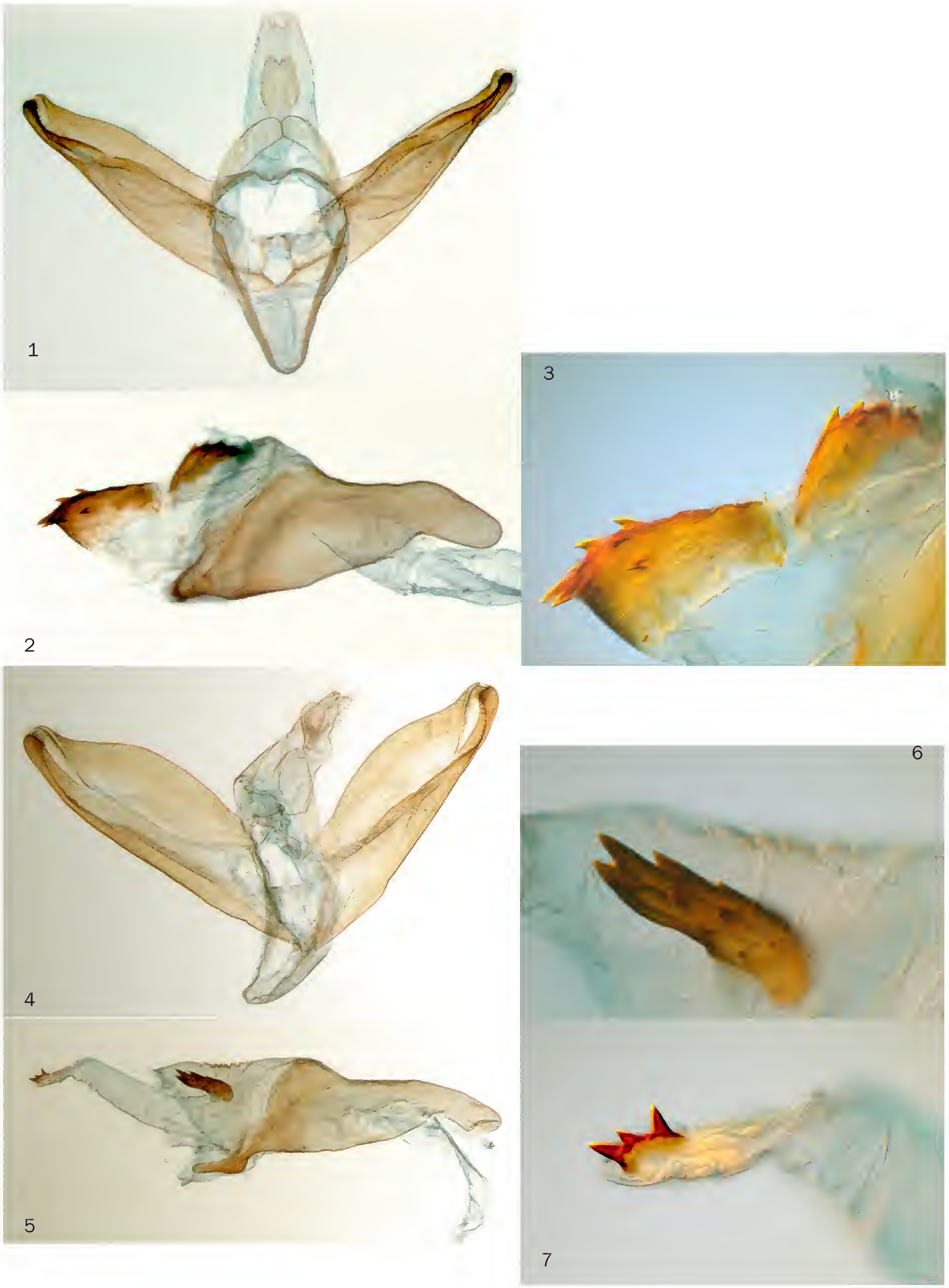
Figures 1-5. 1 – *Monosyntaxis postfuscata* sp. nov., ♀ holotype, Saiko, Upper Waria River, Papua New Guinea (BMNH); 2-5 – Male genitalia of *Monosyntaxis bipunctata* (Bethune-Baker, 1904). 2 – Habitus; 3 – Apex of valva; 4 – Aedeagus; 5 – Cornuti.

Plate 95



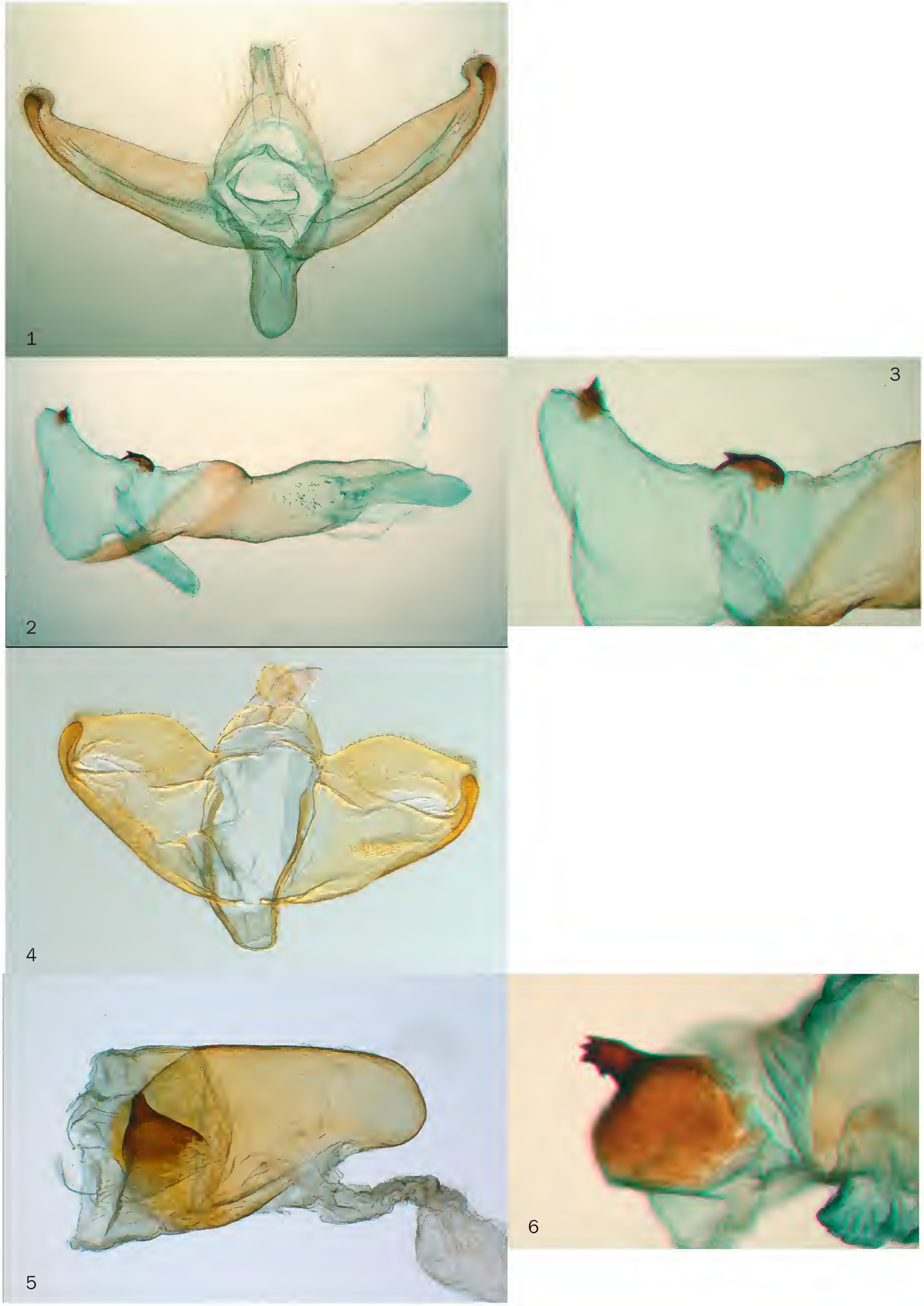
Figures 1-4. Male genitalia of *Monosyntaxis kratkeensis* sp. nov. 1 – Habitus; 2 – Apex of valva; 3 – Aedeagus; 4 – Cornuti.

Plate 96



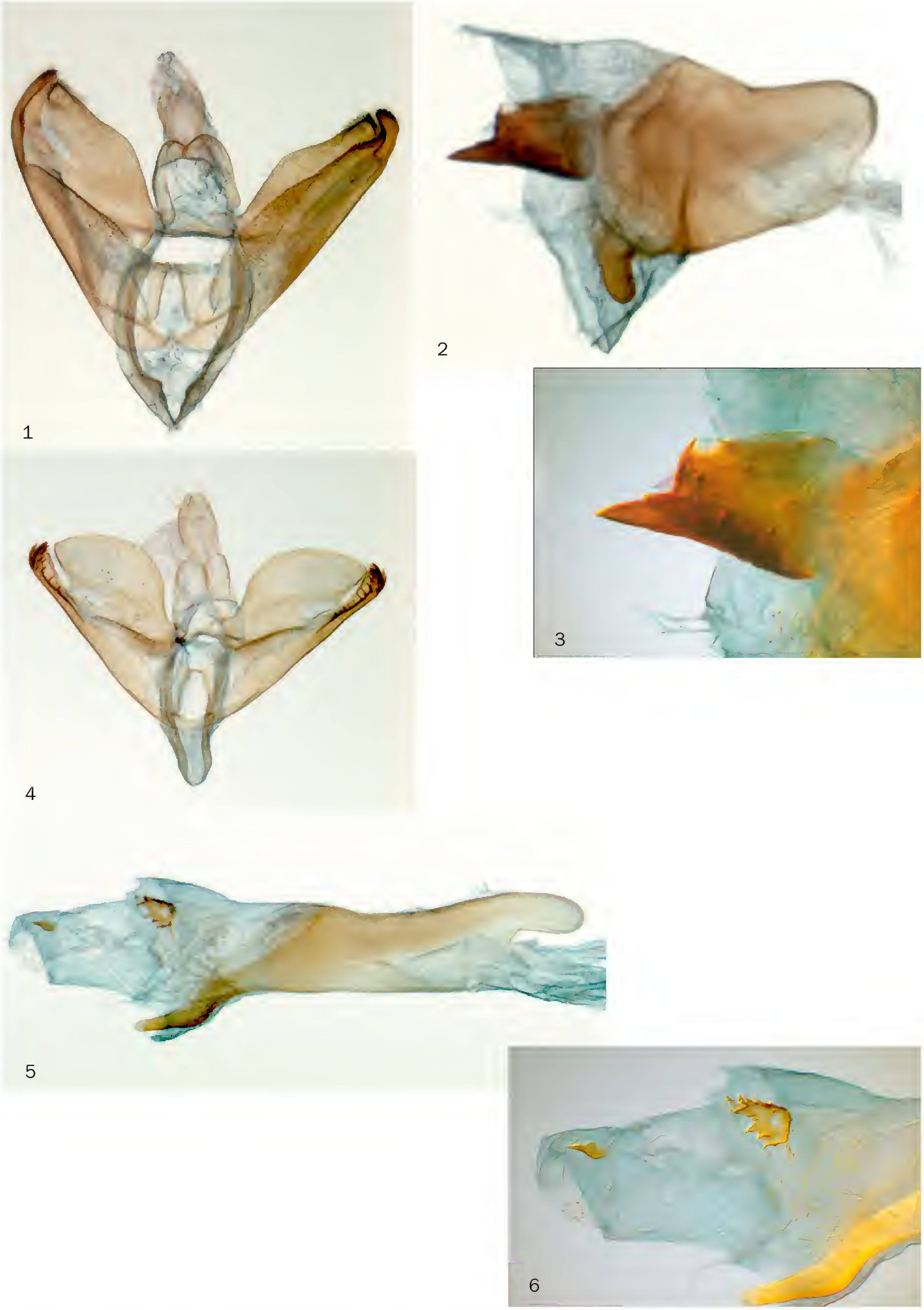
Figures 1-7. Male genitalia of *Monosyntaxis* species. 1-3: *M. honeyi* sp. nov. 1 – Habitus; 2 – Aedeagus; 3 – Cornuti; 4-7 – *M. fojaensis* sp. nov. 4 – Habitus; 5 – Aedeagus; 6 – Basal cornutus; 7 – Distal cornutus.

Plate 97



Figures 1-6. Male genitalia of *Monosyntaxis* species. 1-3: *M. kobowrensis* sp. nov. 1 – Habitus; 2 – Aedeagus; 3 – Cornuti; 4-6 – *M. arfakensis* sp. nov. 4 – Habitus; 5 – Aedeagus; 6 – Cornutus.

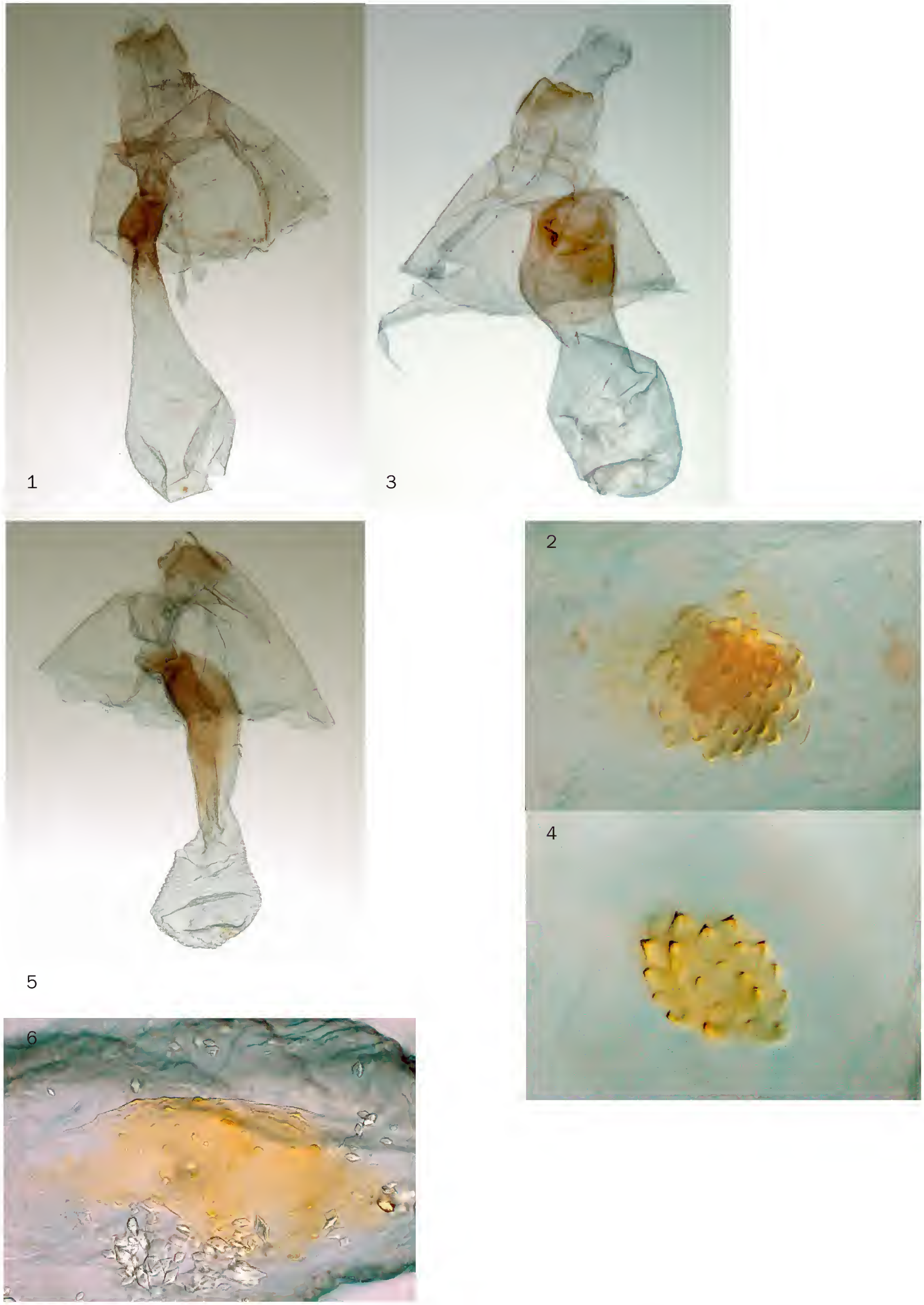
Plate 98



Figures 1-6. Male genitalia of *Monosyntaxis* species. 1-3 – *M. bimaculata* De Vos, 2009. 1 – Habitus; 2 – Aedeagus; 3 – Cornutus; 4-6 – *M. persimilis* Rothschild, 1912. 4 – Habitus; 5 – Aedeagus; 6 – Cornuti.

Plate 99

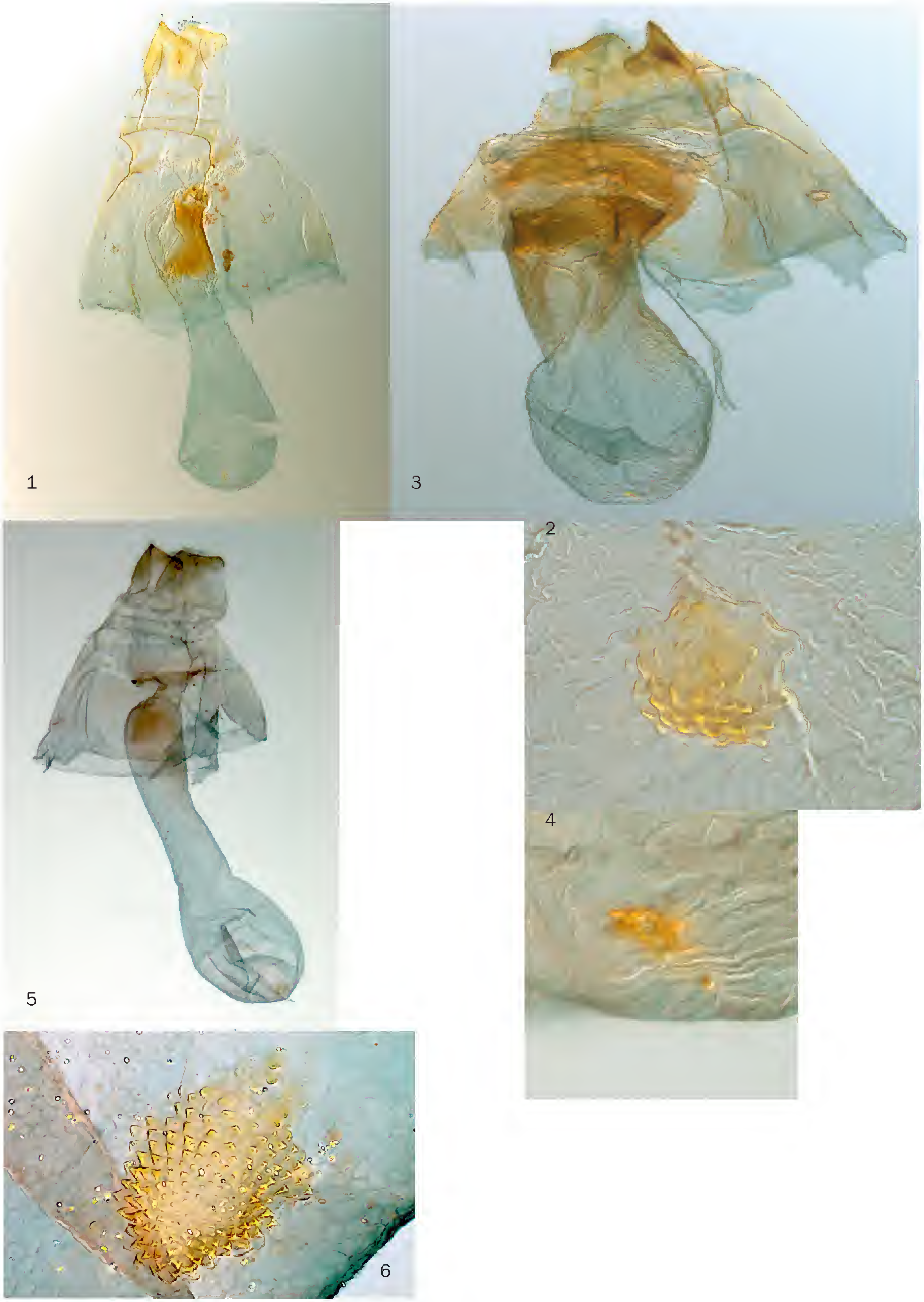
VOS, R. DE: The *Monosyntaxis* Swinhoe, 1901 complex of sibling species in New Guinea (Lepidoptera: Erebidae) …



Figures 1-6. Female genitalia of *Monosyntaxis* species. 1-2 – *M. bipunctata* (Bethune-Baker, 1904). 1 – Habitus; 2 – Signum; 3-4 – *M. honeyi* sp. nov. 4 – Habitus; 5 – Signum; 5-6 – *M. fojaensis* sp. nov. 5 – Habitus; 6 – Signum.

Plate 100

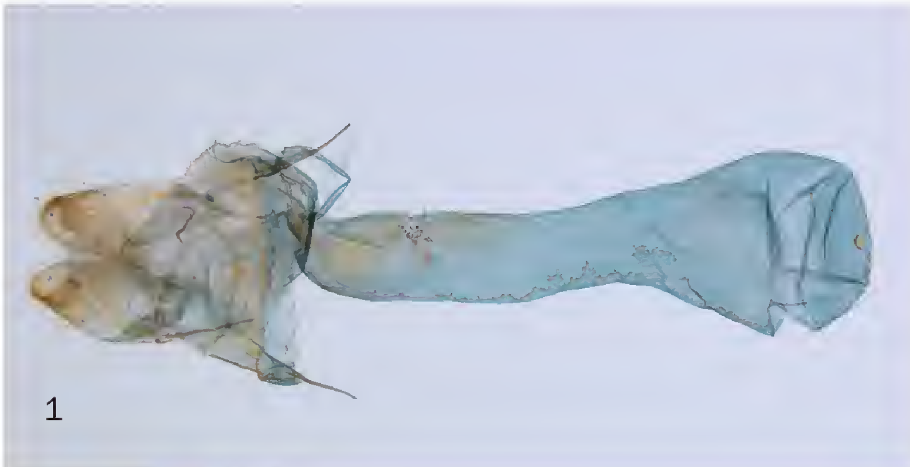
Vos, R. de: The *Monosyntaxis* Swinhoe, 1901 complex of sibling species in New Guinea (Lepidoptera: Erebidae) …



Figures 1-6. Female genitalia of *Monosyntaxis* species. 1-2 – *M. kobowrensis* sp. nov. 1 – Habitus; 2 – Signum; 3-4 – *M. arfakensis* sp. nov. 4 – Habitus; 5 – Signum; 5-6 – *M. persimilis* Rothschild, 1912. 5 – Habitus; 6 – Signum.

Plate 101

Vos, R. de: The *Monosyntaxis* Swinhoe, 1901 complex of sibling species in New Guinea (Lepidoptera: Erebidae) ...



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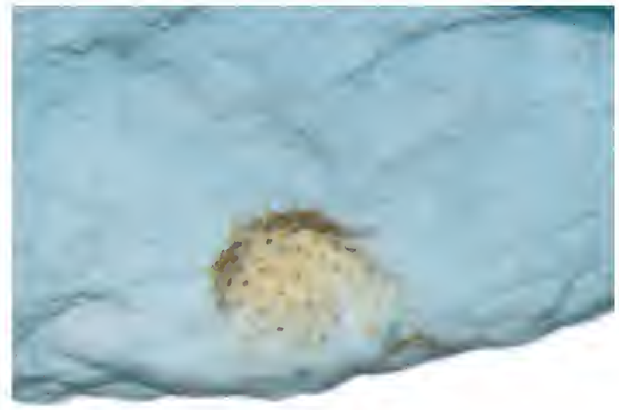

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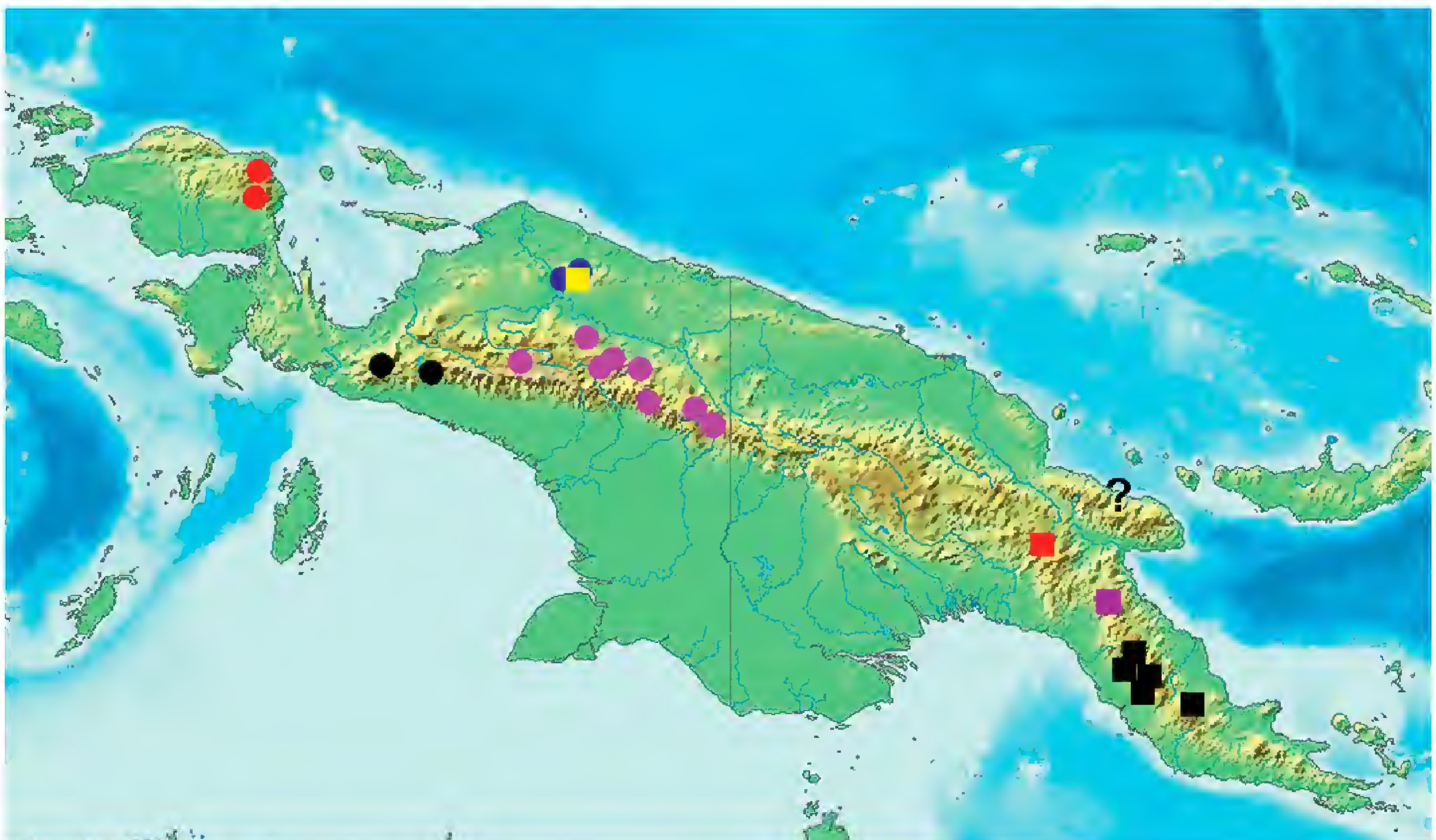

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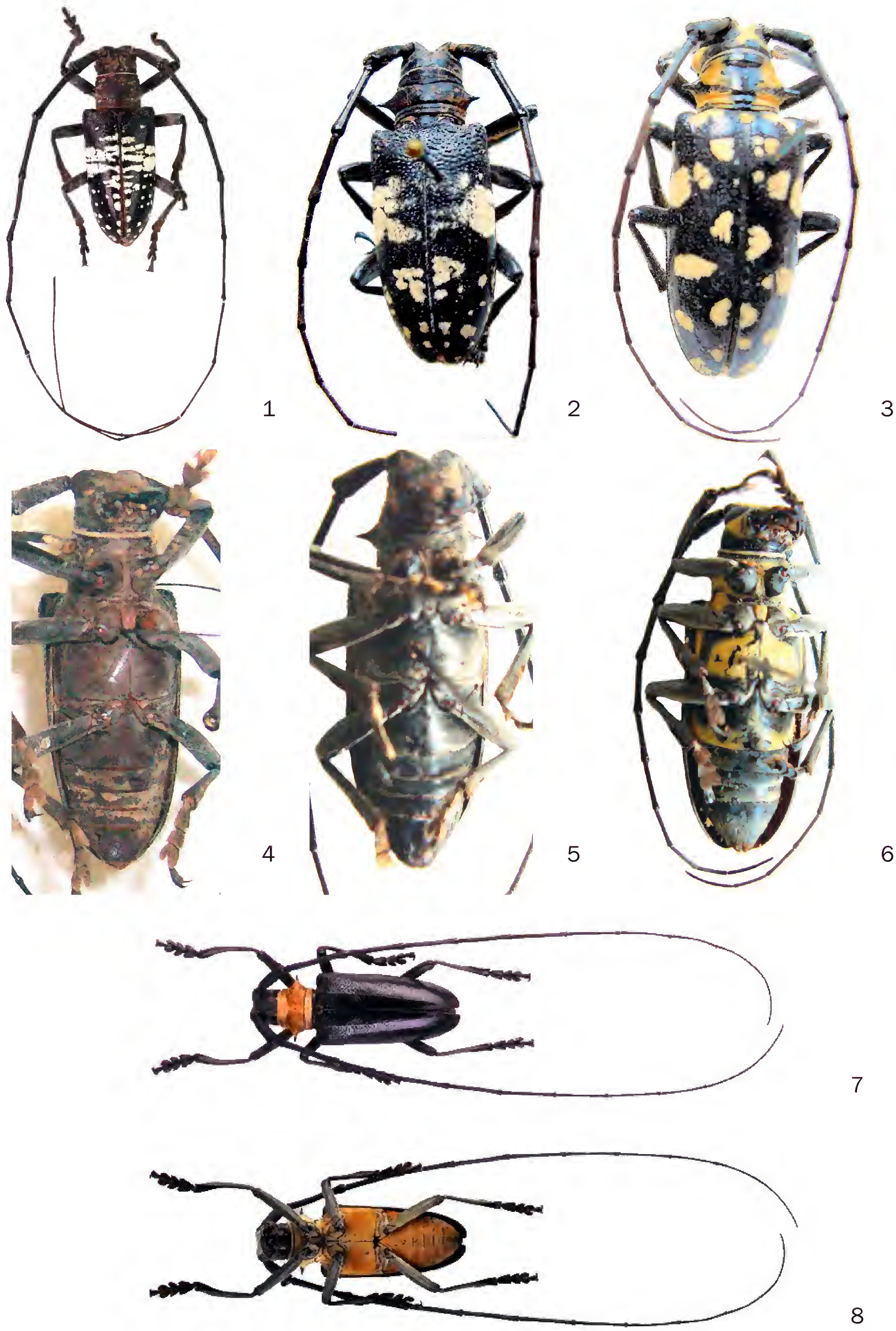
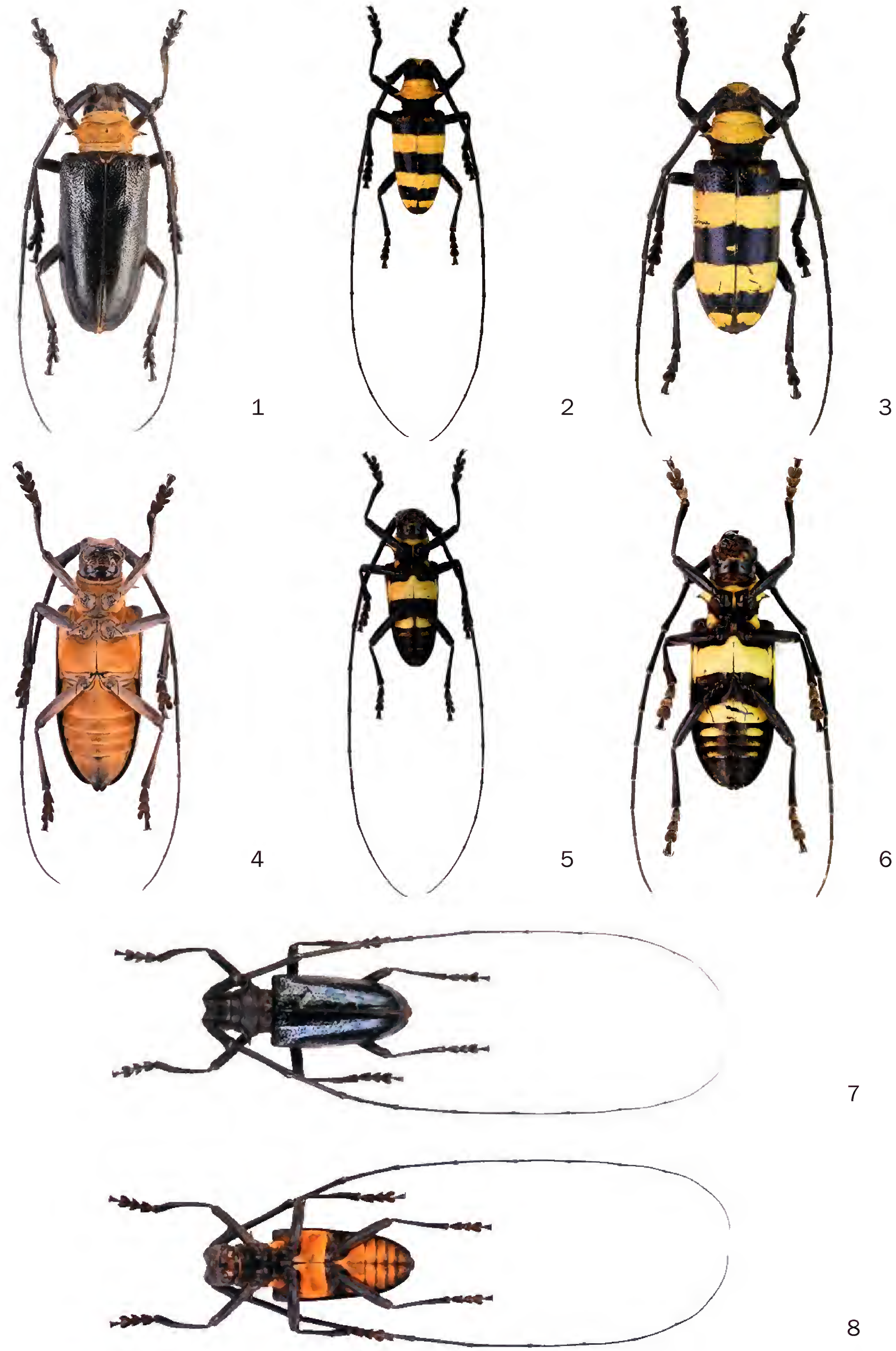
Figures 1-4. 1-2 – Female genitalia of *Monosyntaxis postfuscata* sp. nov. 1 – Habitus; 2 – Signum; 3-4 – Distribution maps of *Monosyntaxis* species. 3 – Red dots *M. arfakensis*, black dots *M. kobowrensis*, purple dots *M. honeyi*, blue dots *M. fojaensis*, yellow square *M. bimaculata*, red square *M. kratkeensis*, purple square *M. postfuscata*, black squares *M. bipunctata*; 4 – *M. persimilis*.



Figures 1-8. *Nemophas* species, habitus in dorsal and ventral view. 1, 4 – *N. ammiralis* Schwarzer, 1931, holotype ♂ FSSF; 2, 5 – ditto, ♀ FCBS (photo: E. Sprecher); 3, 6 – *N. bennigseni* Aurivillius, 1908, ♀ FCBS (photo: E. Sprecher); 7-8 – *N. batoceroides* Thomson, 1864, ♂.

Plate 103

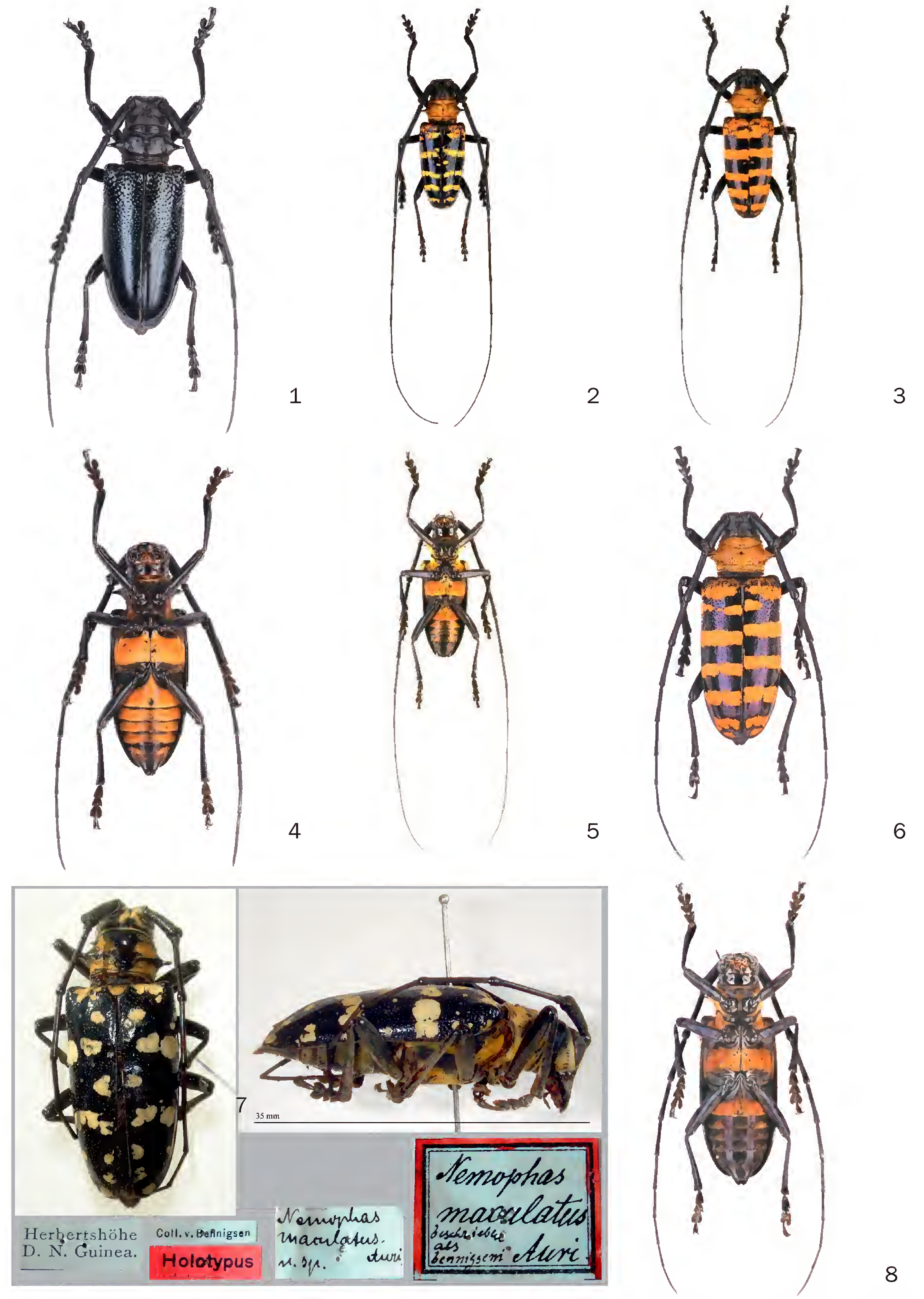
WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) …



Figures 1-8. *Nemophas* species, habitus in dorsal and ventral view. 1, 4 – *N. batoceroides* Thomson, 1864, ♀; 2, 5 – *N. bicinctus* Lansberge van, 1880, ♂; 3, 6 – ditto, ♀; 7-8 – *N. cyanescens* Jordan, 1898, ♂.

Plate 104

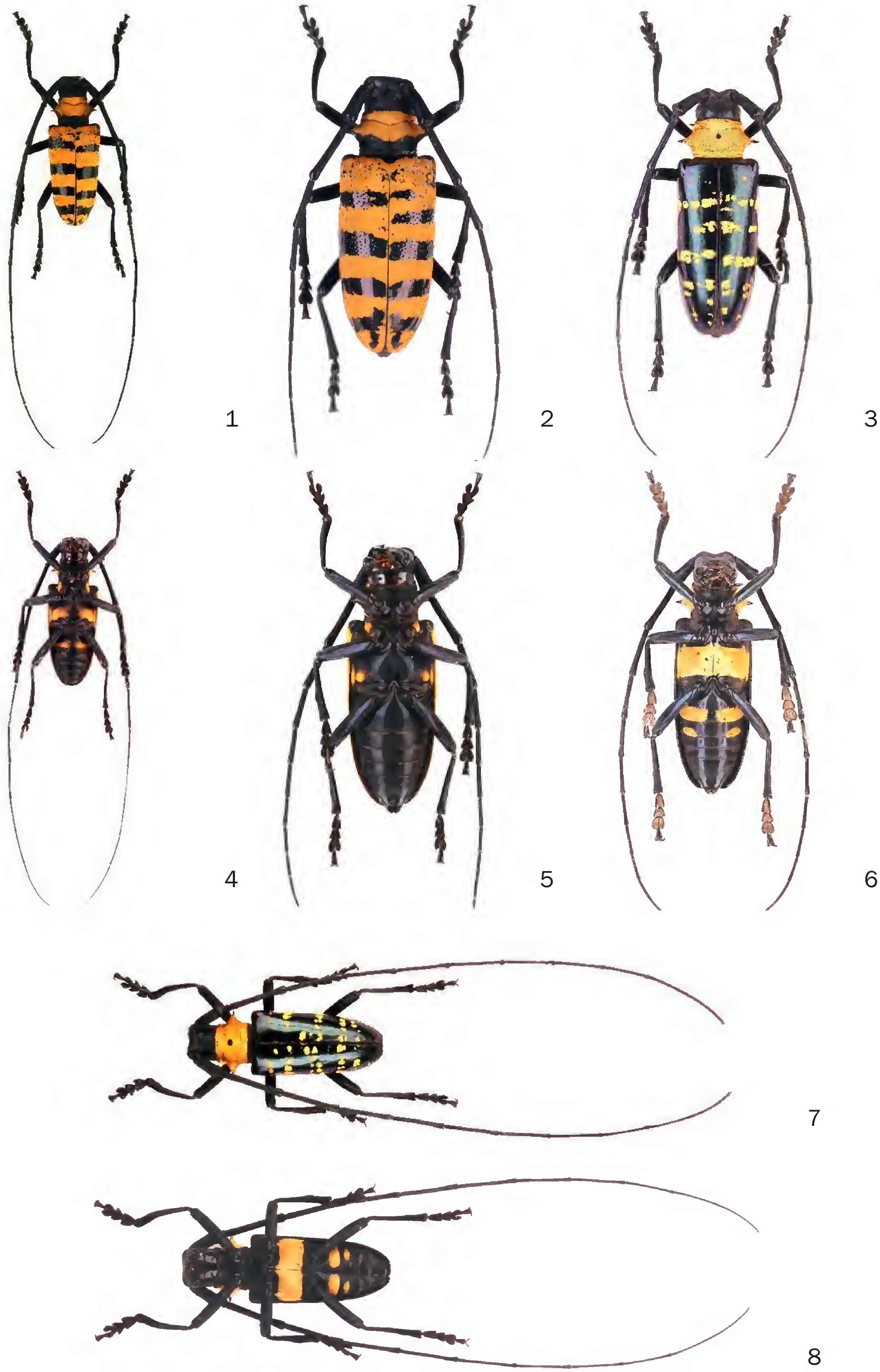
WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



Figures 1-8. *Nemophas* species, habitus in dorsal, ventral and lateral view. 1, 4 – *N. cyanescens* Jordan, 1898, ♀; 2-3, 5 – *N. forbesi* Waterhouse, 1884, ♂; 6, 8 – ditto, ♀; 7 – *N. bennigseni*, holotype ♀ SDEI (photo: L. Behne).

Plate 105

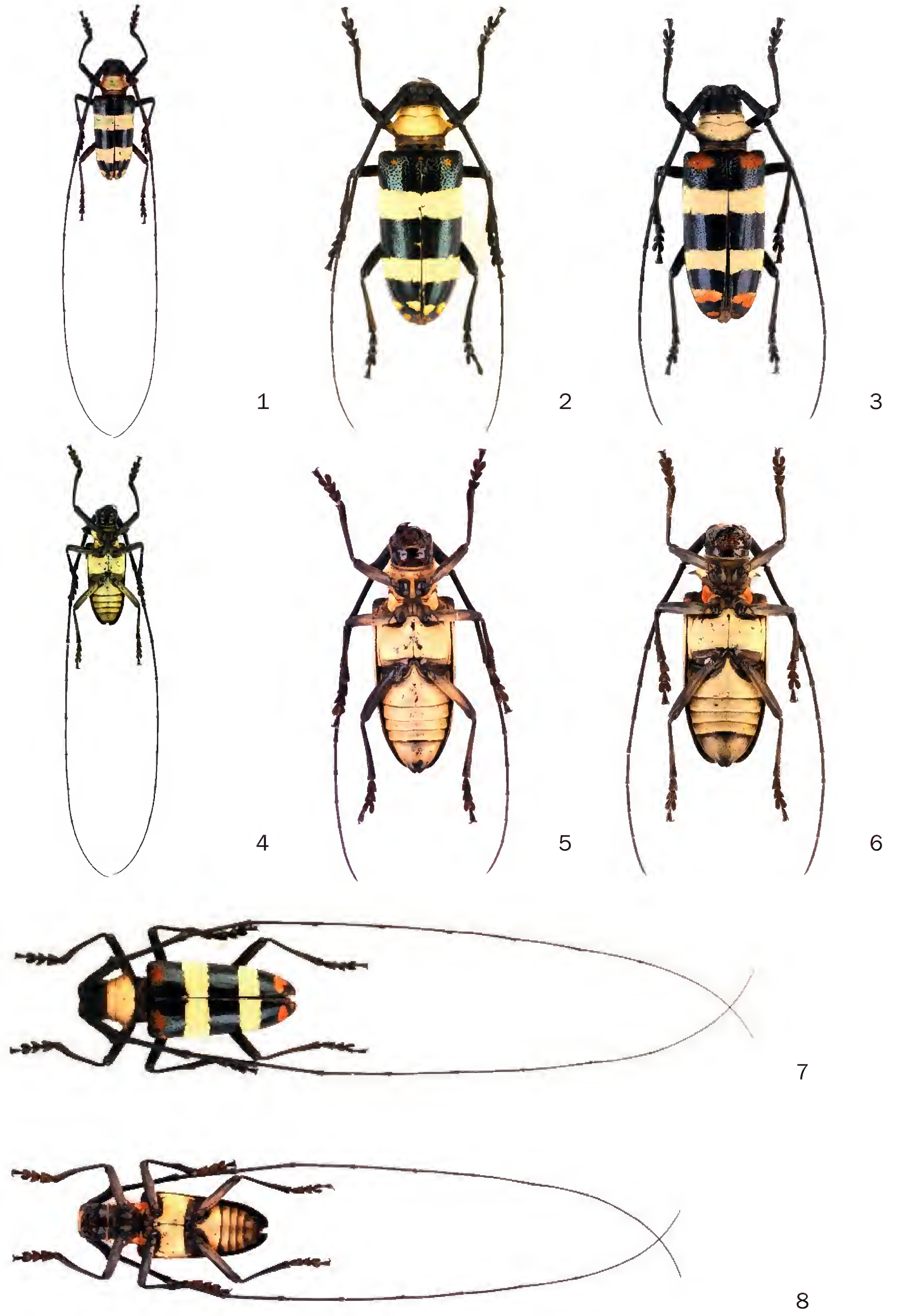
WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) …



Figures 1-8. *Nemophas* species, habitus in dorsal and ventral view. 1, 4 – *N. grayii* (Pascoe, 1859), ♂; 2, 5 –ditto, ♀; 3, 6 – *N. helleri* Hauser, 1904, ♀; 7-8 – ditto, ♂.

Plate 106

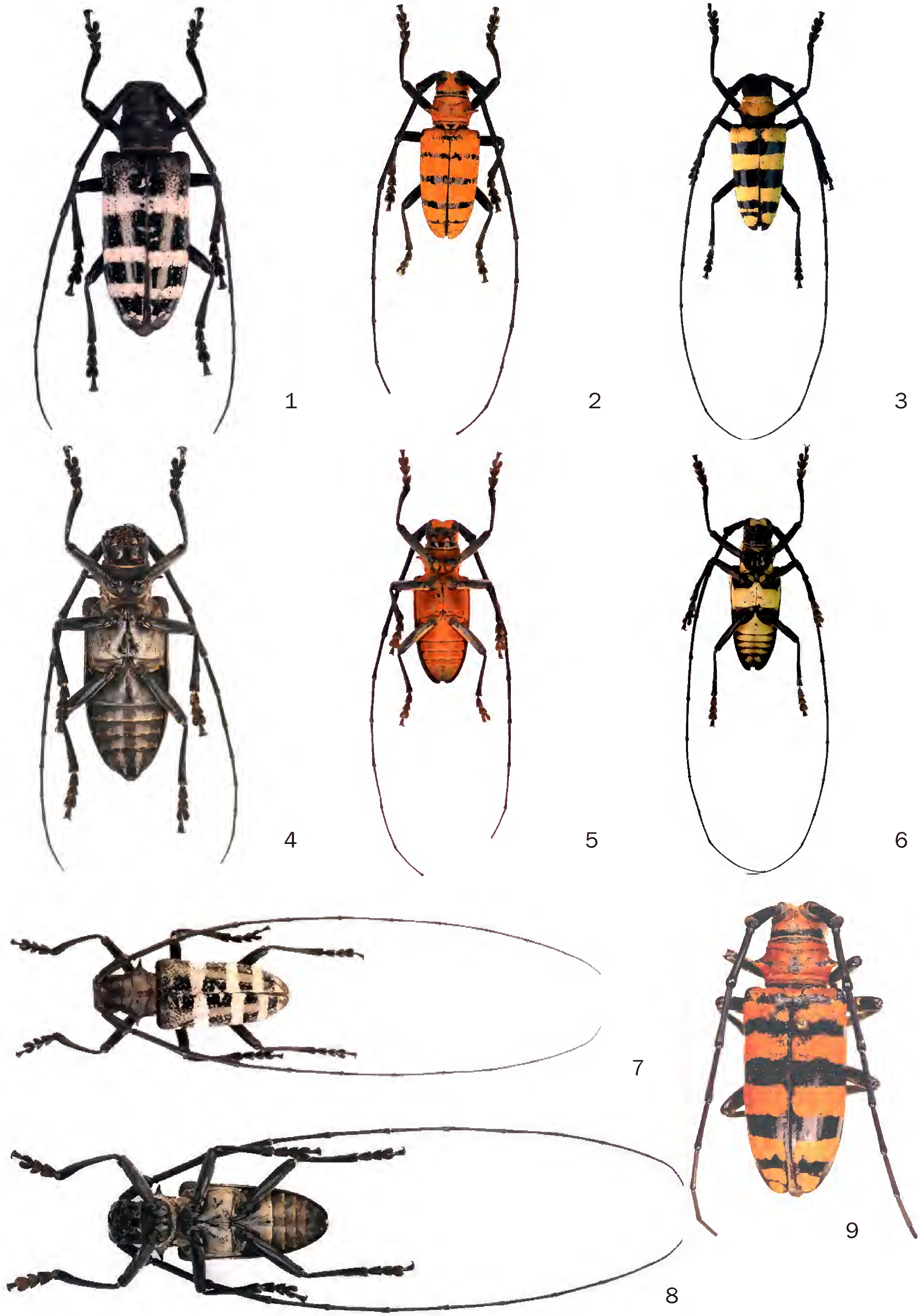
Wallin, H., Kvamme, T. & Nylander, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



Figures 1-8. *Nemophas* species, habitus in dorsal, ventral and lateral view. 1, 4 – *N. rosenbergii* Ritsema, 1881, ♂; 2, 5 – ditto, ♀ 3, 6 – *N. tricolor* Heller, 1896, ♀; 7-8 – ditto, ♂.

Plate 107

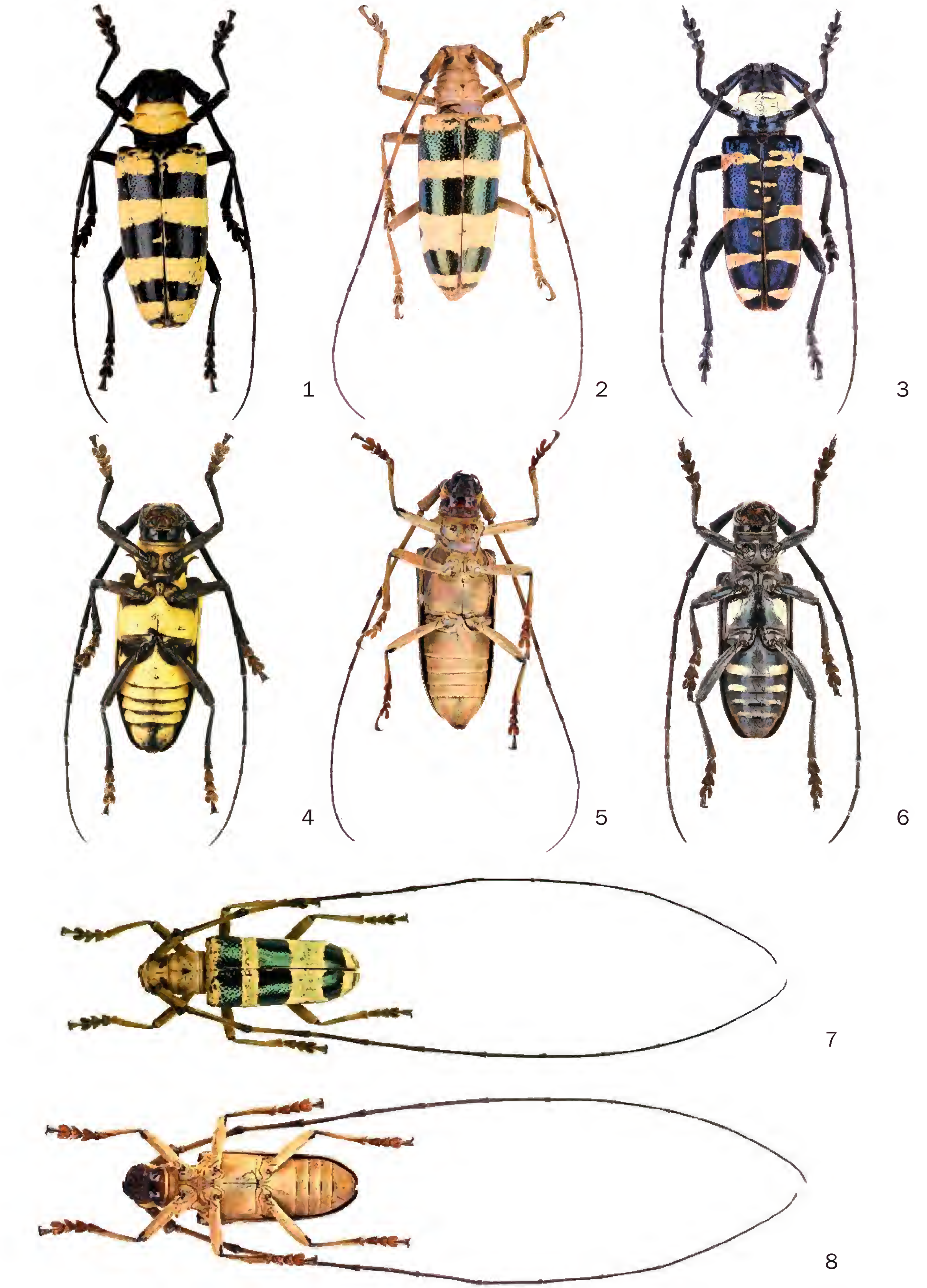
Wallin, H., Kvamme, T. & Nylander, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



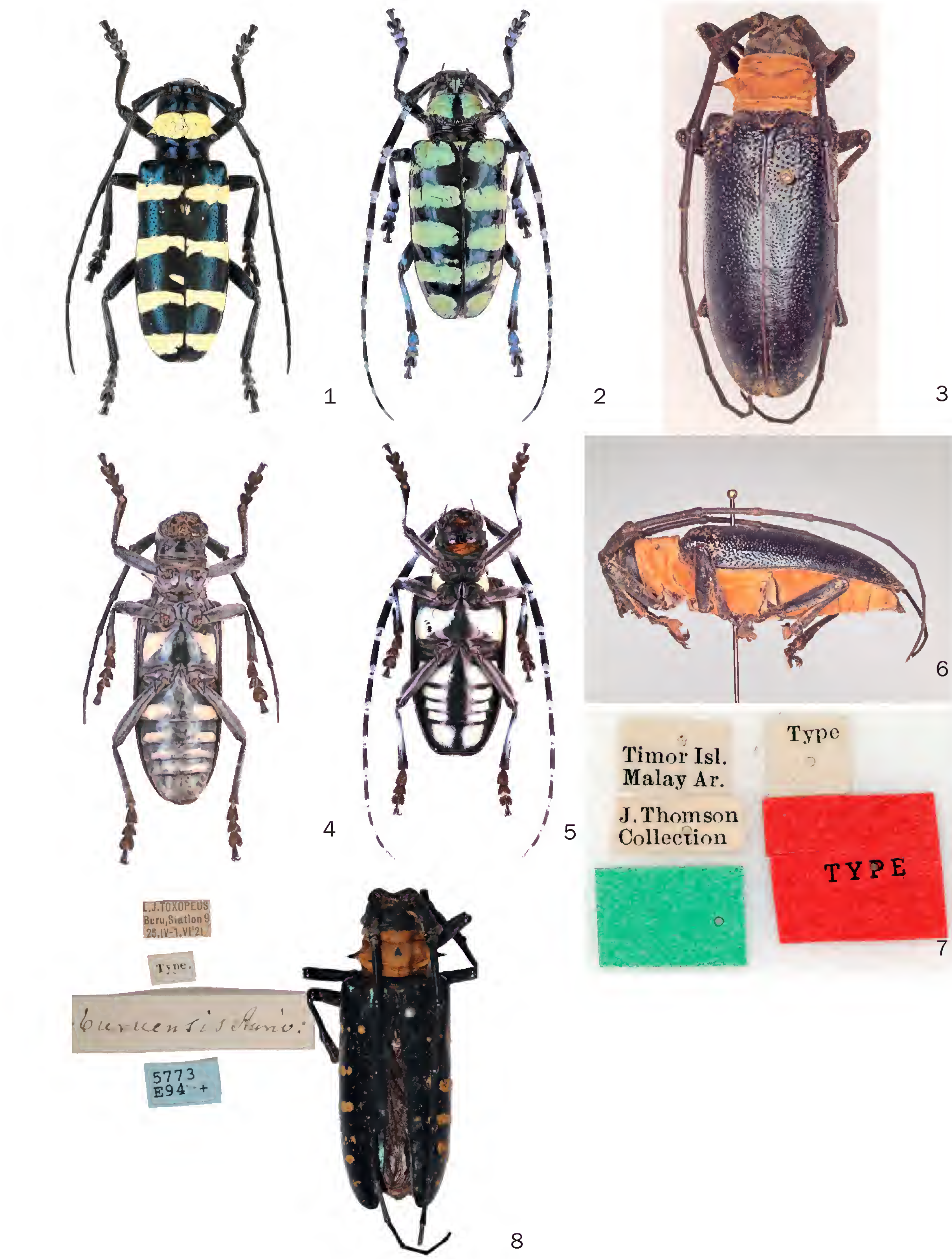
Figures 1-9. *Nemophas* species, habitus in dorsal and ventral view. 1, 4 – *N. trifasciatus* Heller, 1919, ♀; 2, 5 – *N. websteri* Jordan, 1898, ♂; 3, 6 – *N. zonatus* Lansberge van, 1880, ♂; 7-8 – *N. trifasciatus*, ♂; 9 – *N. websteri*, ♀.

Plate 108

WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



Figures 1-8. *Nemophas* and *Nemoplophora* species, habitus in dorsal and ventral view. 1, 4 – *Nemophas zonatus* Lansberge van, 1880, ♀; 2, 5 – *Nemophas (Pilomophas) ramosi* Schulze, 1920, ♀; 3, 6 – *Nemoplophora subcylindricus* (Aurivillius, 1927), ♂; 7-8 – *Nemophas (Pilomophas) ramosi*, ♂.



Figures 1-8. *Anoplophora, Nemophas* and *Nemoplophora* species, habitus in dorsal, ventral and lateral view. 1, 4 – *Nemoplophora subcylindricus* (Aurivillius, 1927), ♀; 2, 5 – *Anoplophora elegans* (Gahan, 1888), ♂; 3, 6-7 – *Nemophas batoceroides* Thomson, 1864, paralectotype ♀ ANSP (photo: J.D. Weintraub); 8 – *Nemophas buruensis* Aurivillius, 1926, lectotype ♀ NHRS (photo: N. Apelqvist).

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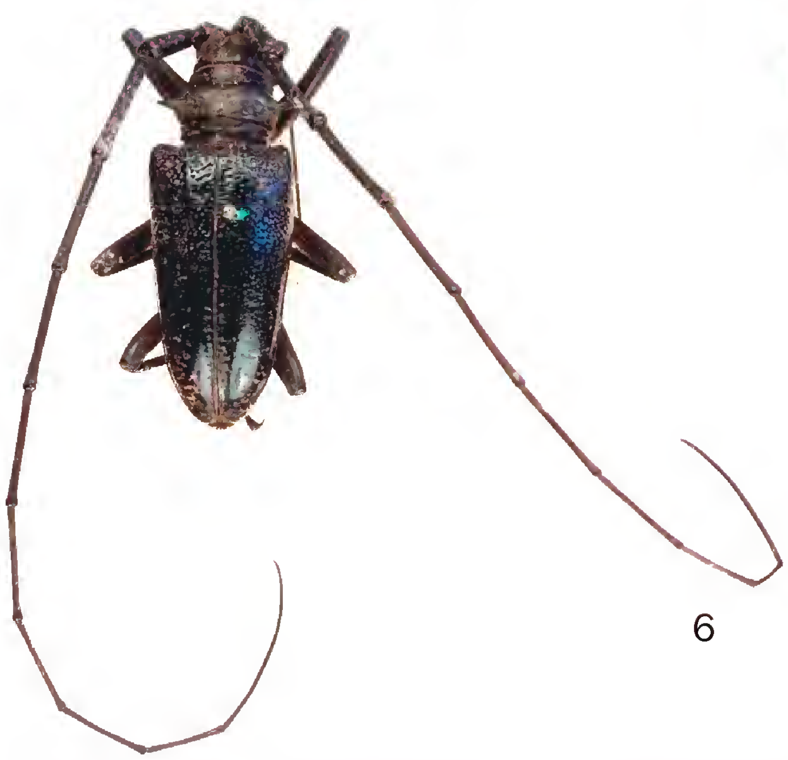

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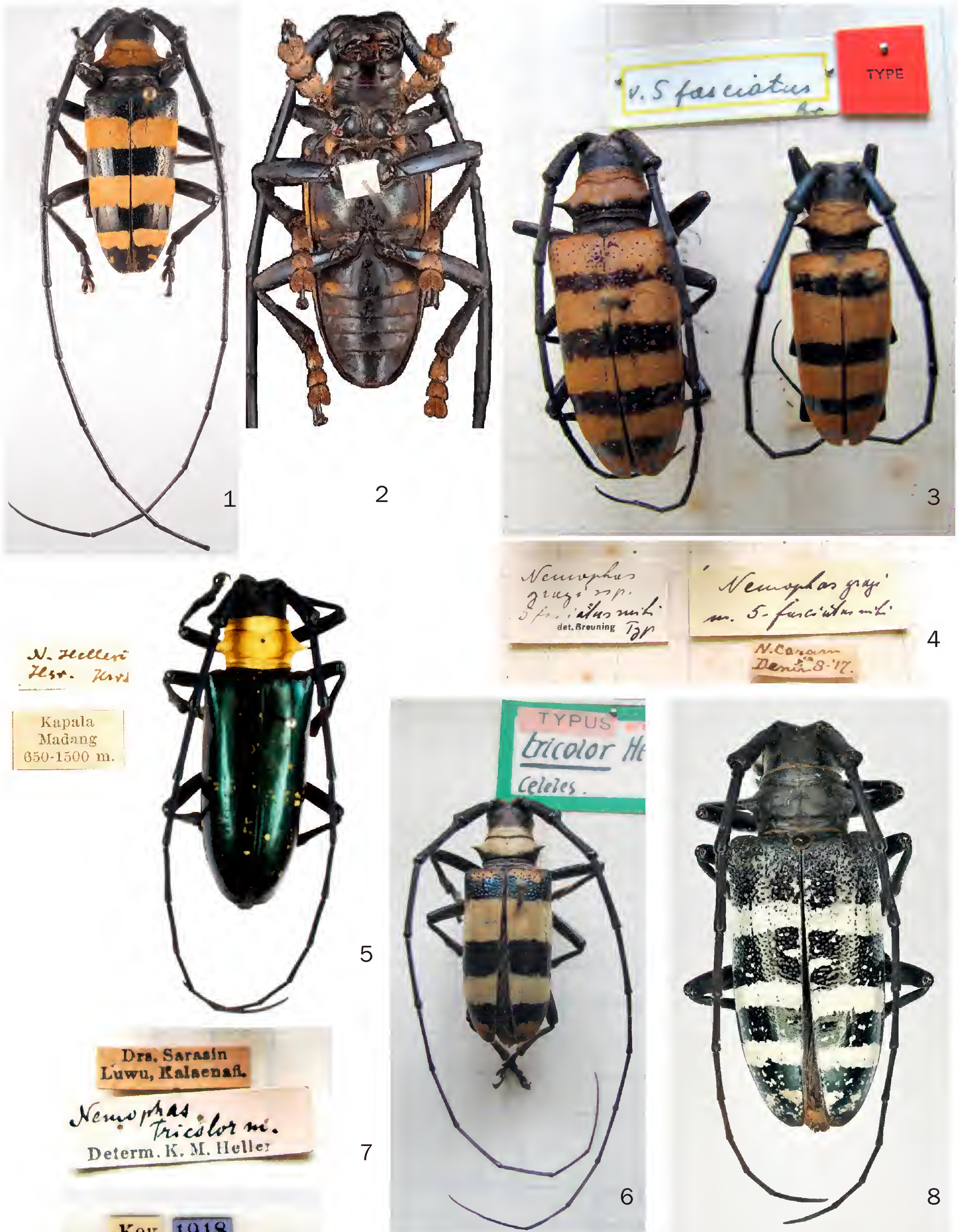
Figures 1-8. *Nemophas* species, habitus in dorsal and lateral view. 1-3 – *N. batoceroides* Thomson, 1864, lectotype ♂ MNHN (photo: G. Tavakilian); 4-5 – *N. bicinctus* Lansberge van, 1880, holotype ♀ MNHN (photo: G. Tavakilian); 6-8 – *N. cyanescens* Jordan, 1898, lectotype ♂ MNHN (photo: G. Tavakilian).

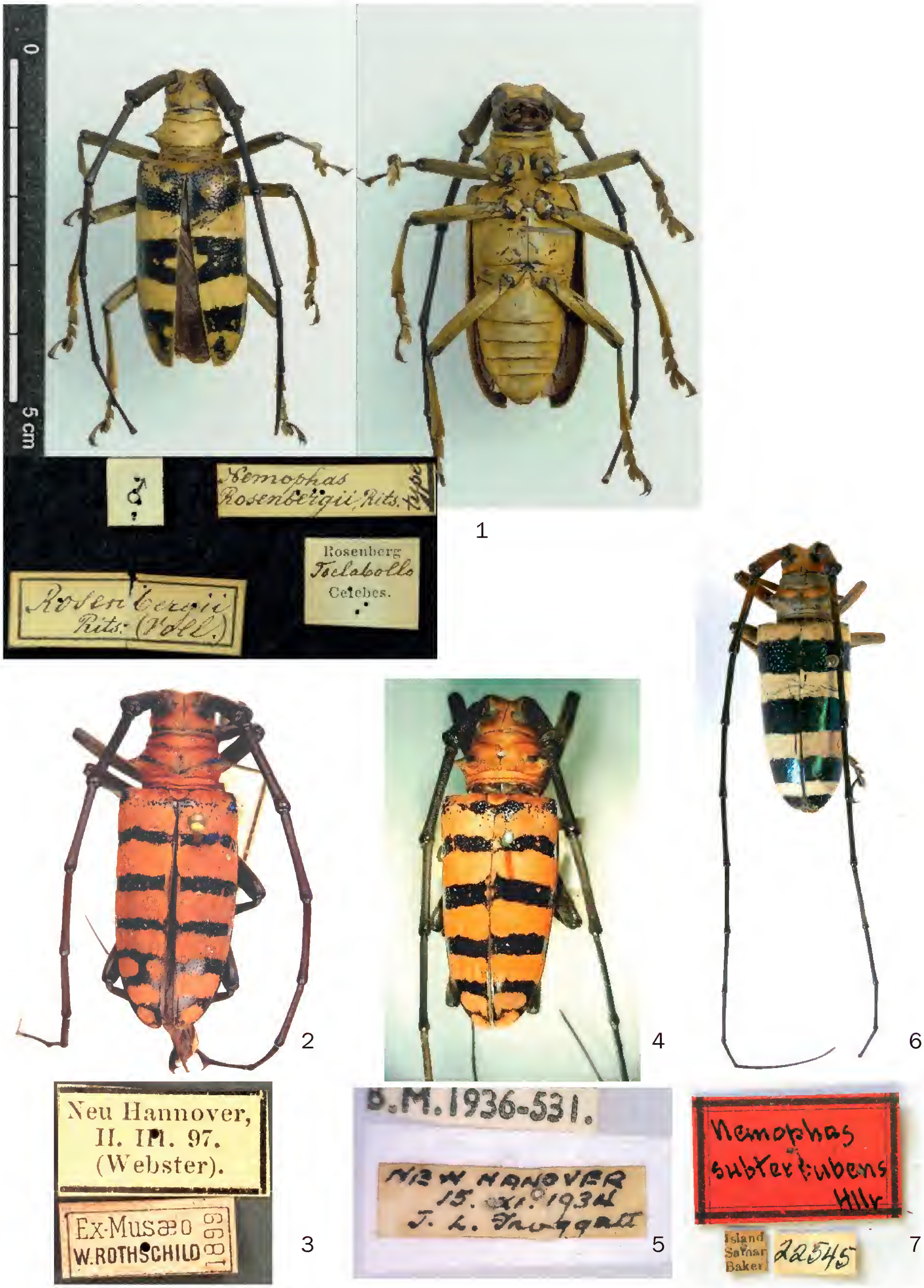
Figures 1-2. *Nemophas* species, habitus in dorsal and ventral view. 1 – *N. forbesi* Waterhouse, 1884, lectotype ♂ BMNH (photo: S. Shute & E. McAlister); 2 – *N. grayii* (Pascoe, 1859), holotype ♂ BMNH (photo: S. Shute & E. McAlister).



Figures 1-9. *Nemophas* species, habitus in dorsal and ventral view. 1-2 – *Monohammus* [sic!] *doleschali* Redtenbacher, 1867, holotype ♂ NHMW (photo: H. Schönmann & H. Schillhammer); 3-4 – *N. grayi* m. *quinquefasciatus* Breuning, 1943, holotype ♀ FCNMB (photo: E. Sprecher); 5 – *N. helleri* Hauser, 1904, lectotype ♀ MFN (photo: J. Willers); 6-7 – *N. tricolor* Heller, 1896, lectotype ♂ FCNMB (photo: E. Sprecher); 8-9 – *N. trifasciatus* Heller, 1919, lectotype ♀ FSSD (photo: O. Jaeger).

Plate 113

WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



Figures 1-7. *Nemophas* species, habitus in dorsal and ventral view. 1 – *N. rosenbergii* Ritsema, 1881, holotype ♂ (photo: S.A. Ulenberg & B. Brugge); 2-3 – *N. websteri* Jordan, 1898, paralectotype ♂ MNHN (photo: G. Tavakilian); 4-5 – *N. websteri* Jordan, 1898, ♂ BMNH (photo: S. Shute & E. McAlister), assumed to be the most recently collected specimen (1934) from New Hanover Island, Bismarck Archipelago; 6-7 – *N. subterrubens* Heller, 1924, lectotype ♂ (photo: S.W. Lingafelter).

Plate 114

WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...

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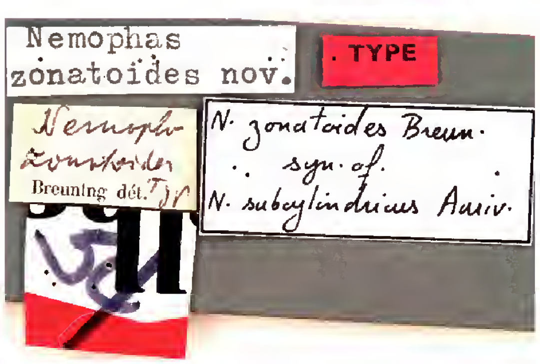

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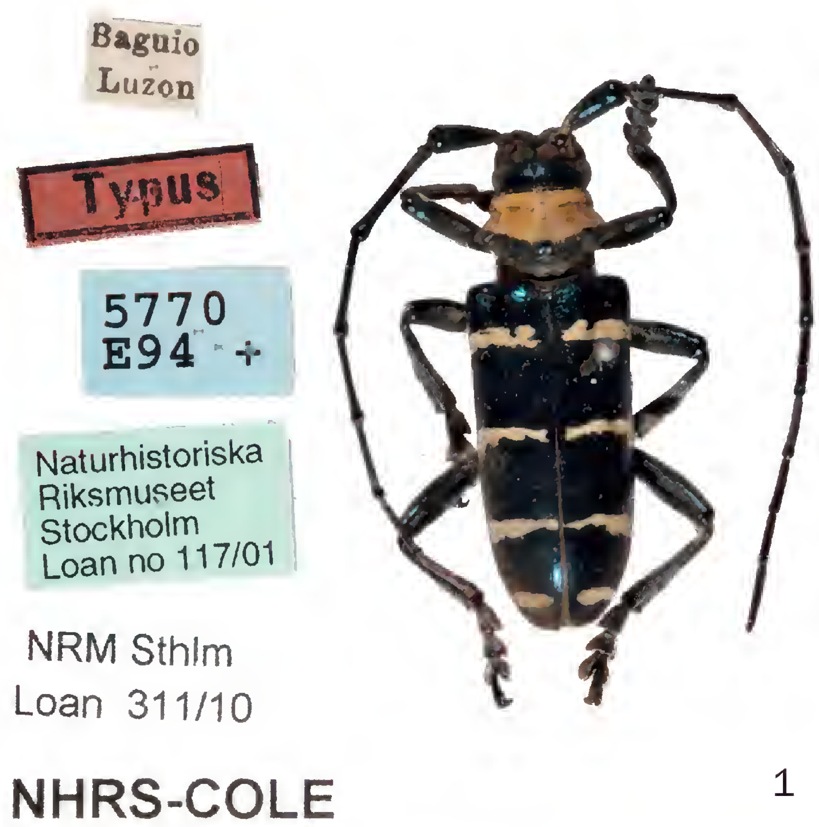
Figures 1-8. *Nemophas* and *Nemoplophora* species, habitus in dorsal view. 1-2 – *Nemophas zonatus* Lansberge van, 1880, holotype ♀ MNHN (photo: G. Tavakilian); 3-4 – *Nemophas subterrubens* Heller, 1924, paralectotype ♀ FSSD (photo: O. Jaeger); 5 – *Nemoplophora subcylindricus* (Aurivillius, 1927), holotype ♂ USNM (photo: S.W. Lingafelter); 6-7 – *Nemophas zonatoides* Breuning, 1980, holotype ♂ MNHN (photo: G. Tavakilian); 8 – ditto, paratype ♂ MFN (photo: J. Willers).



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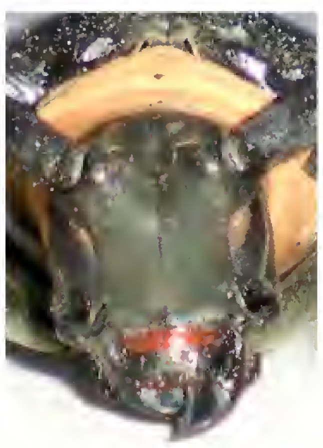

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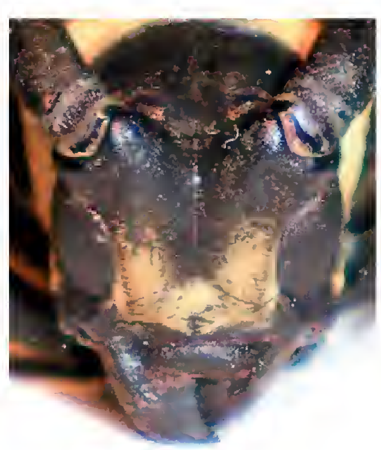

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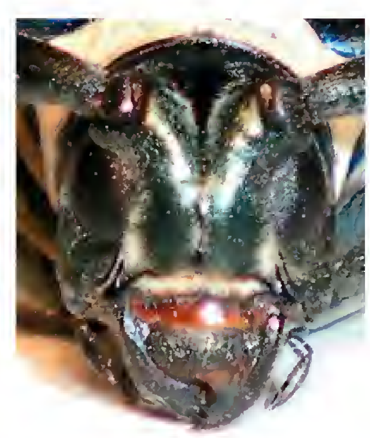

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Figures 1-9. *Nemophas* and *Nemoplophora* species. 1 – *Nemoplophora subcylindricus* var. *virescens* (Aurivillius, 1927), holotype ♂ NHRS, habitus in dorsal view (photo: N. Apelqvist); 2-9 – Frons. 2 – *Nemophas batoceroides* Thomson, 1864; 3 – *N. bicinctus* Lansberge van, 1880; 4 – *N. rosenbergii* Ritsema, 1881; 5 – *N. tricolor* Heller, 1896; 6 – *N. websteri* Jordan, 1898; 7 – *N. zonatus* Lansberge van, 1880; 8 – *N. (Pilomophas) ramosi* Schulze, 1920; 9 – *Nemoplophora subcylindricus* (Aurivillius, 1927).

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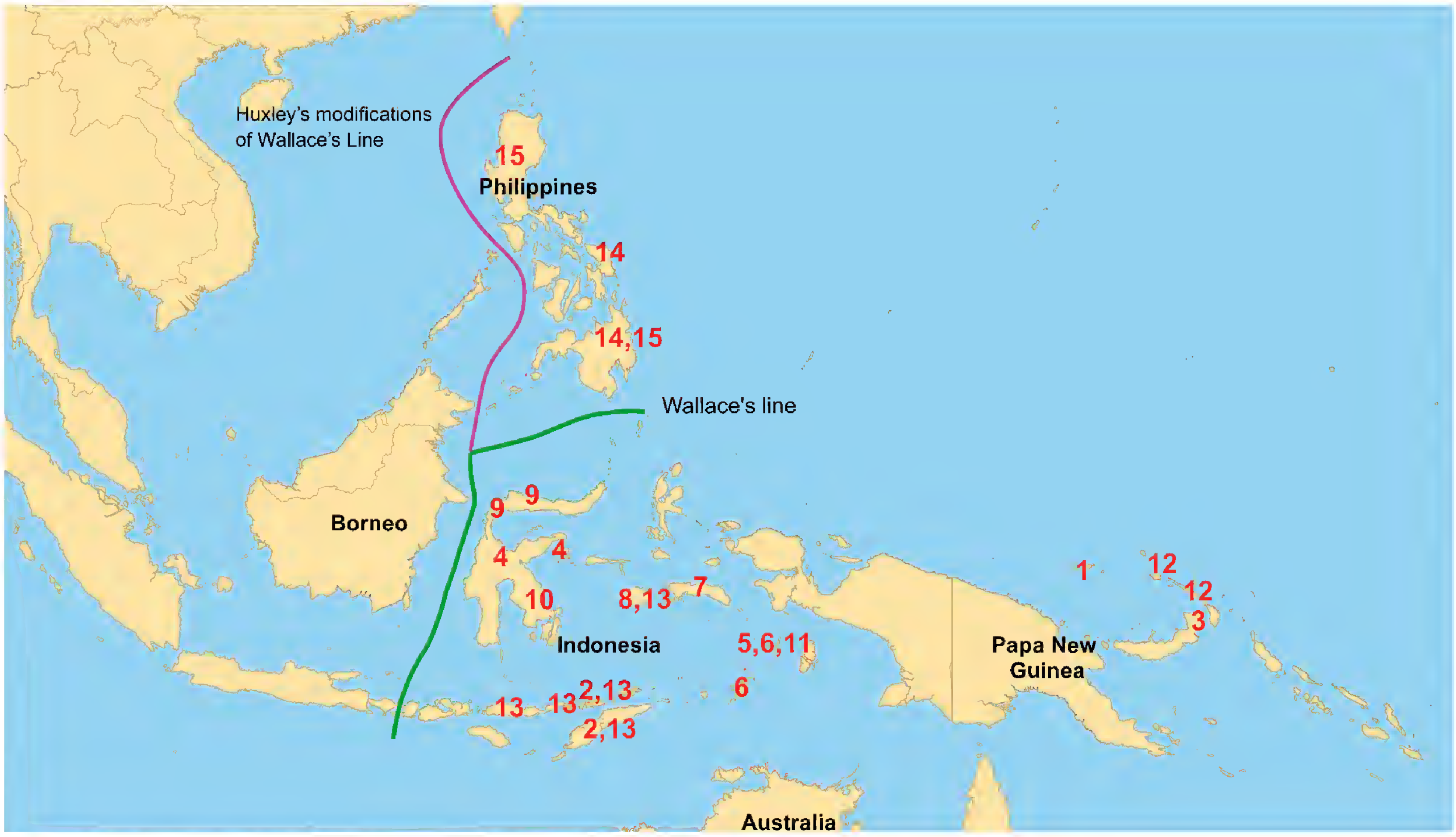


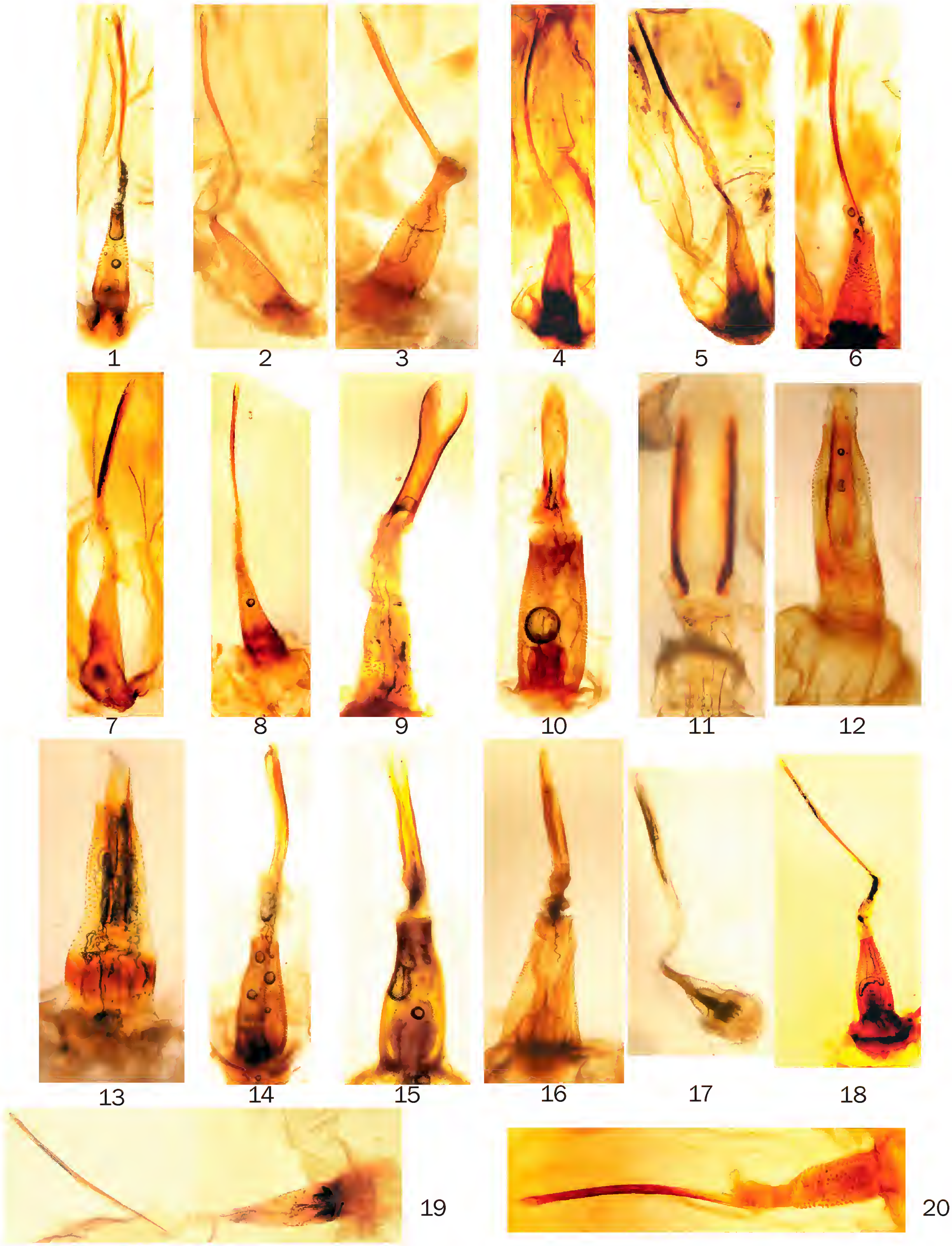
Figure 1. Known records of *Nemophas* s. str. and *Nemoplophora* gen. nov. on the Philippines, in Indonesia and Papua New Guinea. 1 – *Nemophas ammiralis* Schwarzer, 1931; 2 – *N. batoceroides* Thomson, 1864; 3 – *N. bennigseni* Aurivillius, 1908; 4 – *N. bicinctus* Lansberge van, 1880; 5 – *N. cyanescens* Jordan, 1898; 6 – *N. forbesi* Waterhouse, 1884; 7 – *N. grayii* (Pascoe, 1859); 8 – *N. helleri* Hauser, 1904; 9 – *N. rosenbergii* Ritsema, 1881; 10 – *N. tricolor* Heller, 1896; 11 – *N. trifasciatus* Heller, 1919; 12 – *N. websteri* Jordan, 1898; 13 – *N. zonatus* Lansberge van, 1880; 14 – *N. (Pilomophas) ramosi* Schulze, 1920; 15 – *Nemoplophora subcylindricus* (Aurivillius, 1927).

2

Figure 2. Primary rainforest with cultivation on the foreground, Mount Apo National park (peak elevation of 2954 m), Mindanao, the Philippines: Habitat of *Nemophas (Pilomophas) ramosi* Schulze, 1920 comb. nov. (photo: M. Riebe, 2006).

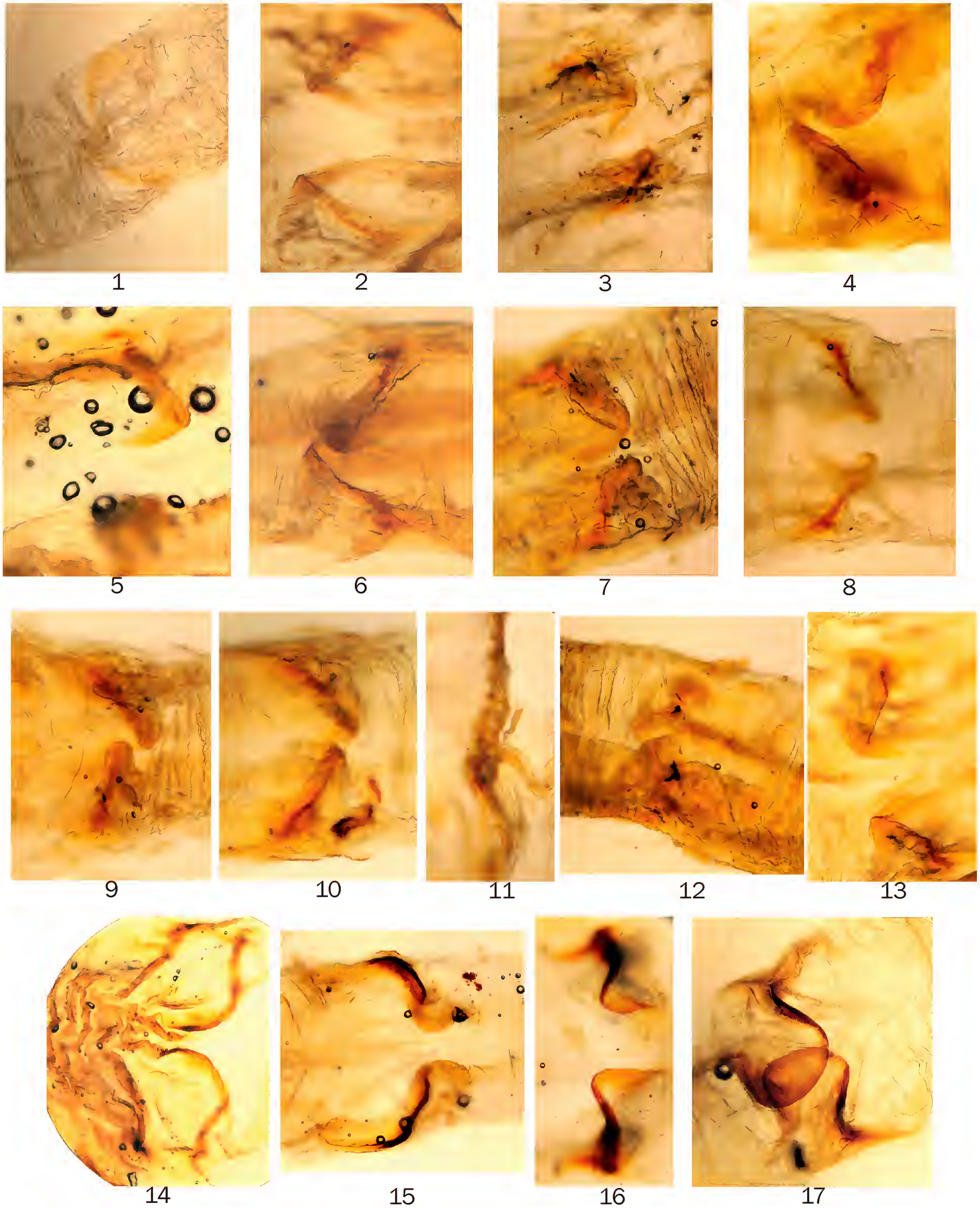
Plate 117

WALLIN, H., KVAMME, T. & NYLANDER, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) …



Figures 1-20. The elongated median sclerite inside the (opened) internal sac in Cerambycidae males. 1 – *Nemophas forbesi* Waterhouse, 1884; 2 – *N. grayii* (Pascoe, 1859); 3 – *N. helleri* Hauser, 1904; 4 – *N. rosenbergii* Ritsema, 1881; 5 – *N. tricolor* Heller, 1896; 6 – *N. trifasciatus* Heller, 1919; 7 – *N. websteri* Jordan, 1898; 8 – *N. zonatus* Lansberge van, 1880; 9 – *N. (Pilomophas) ramosi* Schulze, 1920; 10 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 11 – *Anoplophora elegans* (Gahan, 1888); 12 – *Pseudoemophas baluanus* (Aurivillius, 1923); 13 – *Pseudonemophas versteegi* (Ritsema, 1881); 14 – *Iothocera tomentosa* (Buquet, 1859); 15 – *Dolichoprosopus leuciscus* (Pascoe, 1866); 16 – *Cornuscoparia annulicornis* (Heller, 1897); 17 – *Nemophas ammiralis* Schwarzer, 1931, holotype; 18 – *N. batoceroides* Thomson, 1864; 19 – *N. bicinctus* Lansberge van, 1880; 20 – *N. cyanescens* Jordan, 1898.

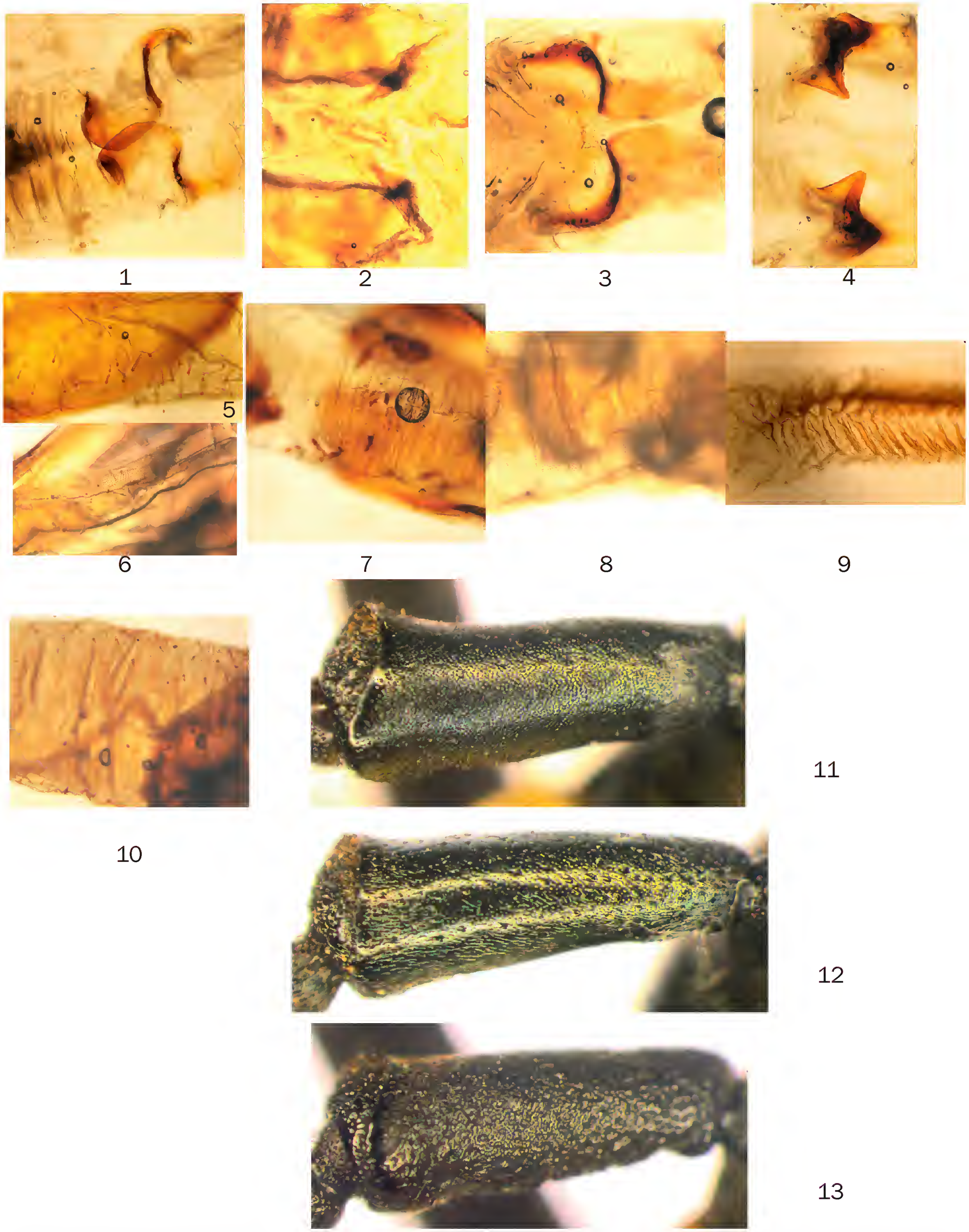
Plate 118



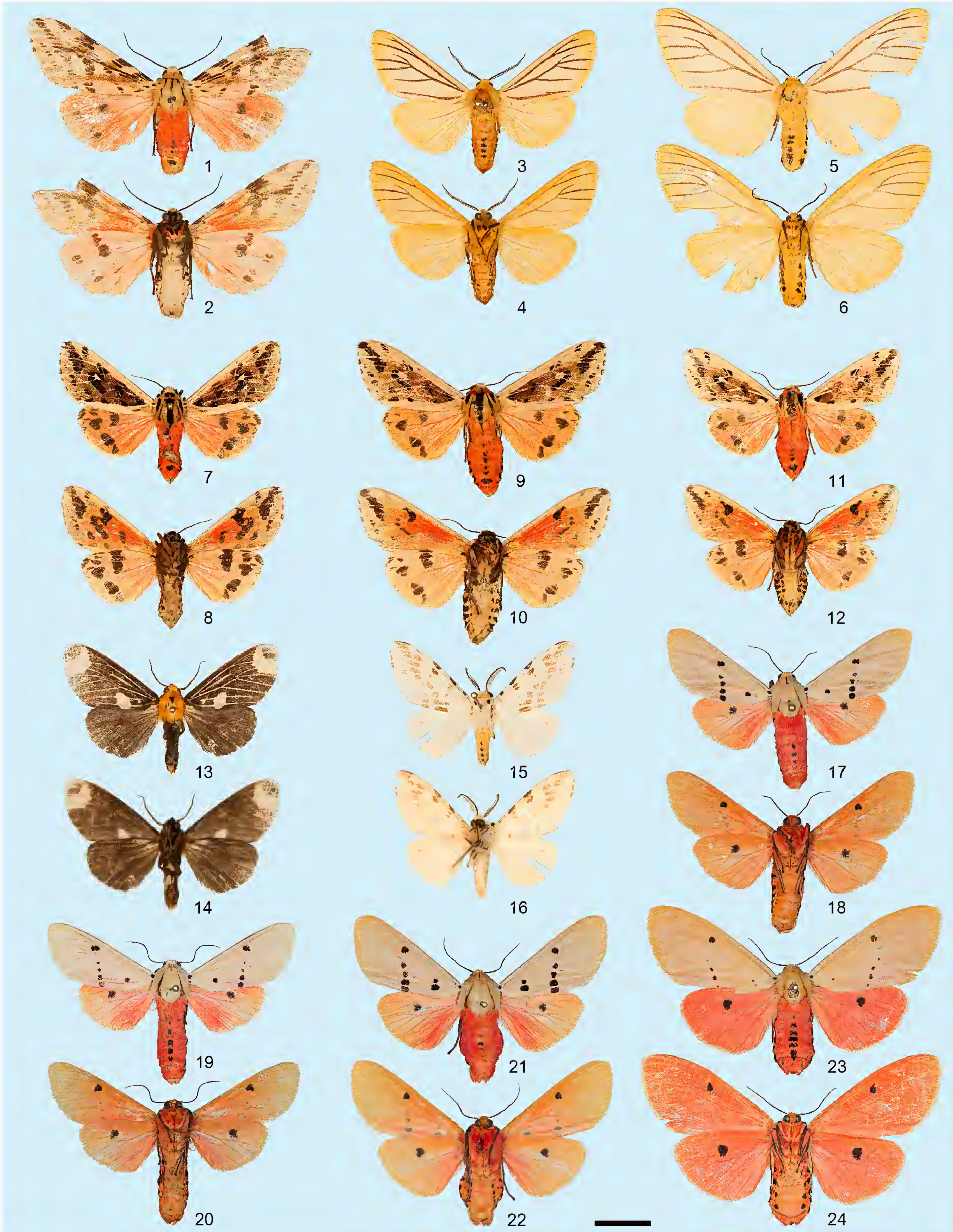
Figures 1-17. The crescent-shaped sclerites at proximal end of basal segment in Cerambycidae males. 1 – *Nemophas ammiralis* Schwarzer, 1931, holotype; 2 – *N. batoceroides* Thomson, 1864; 3 – *N. bicinctus* Lansberge van, 1880; 4 – *N. cyanescens* Jordan, 1898; 5 – *N. forbesi* Waterhouse, 1884; 6 – *N. grayii* (Pascoe, 1859); 7 – *N. helleri* Hauser, 1904; 8 – *N. rosenbergii* Ritsema, 1881; 9 – *N. tricolor* Heller, 1896; 10 – *N. trifasciatus* Heller, 1919; 11 – *N. websteri* Jordan, 1898; 12 – ditto; 13 – *N. zonatus* Lansberge van, 1880; 14 – *N. (Pilomophas) ramosi* Schulze, 1920; 15 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 16 – *Anoplophora elegans* (Gahan, 1888); 17 – *Pseudoemophas baluanus* (Aurivillius, 1923).

Plate 119

Wallin, H., Kvamme, T. & Nylander, U.: A revision of the genus *Nemophas* Thomson, 1864 (Coleoptera: Cerambycidae) ...



Figures 1-13. The crescent-shaped sclerites at proximal end of basal segment, median phallomer membrane and scape in Cerambycidae males. 1-4 – Sclerites. 1 – *Pseudonemophas versteegi* (Ritsema, 1881); 2 – *Iothocera tomentosa* (Buquet, 1859); 3 – *Dolichoprosopus leuciscus* (Pascoe, 1866); 4 – *Cornuscoparia annulicornis* (Heller, 1897); 5-10 – Membrane. 5 – *N. cyanescens* Jordan, 1898; 6 – *Nemophas (Pilomophas) ramosi* Schulze, 1920; 7 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 8 – *Anoplophora elegans* (Gahan, 1888); 9 – *Pseudonemophas baluanus* (Aurivillius, 1923); 10 – *Iothocera tomentosa* (Buquet, 1859); 11-13 – Scape. 11 – *Nemophas bicinctus* Lansberge van, 1880; 12 – *Nemoplophora subcylindricus* (Aurivillius, 1927); 13 – *Nemophas websteri* Jordan, 1898.

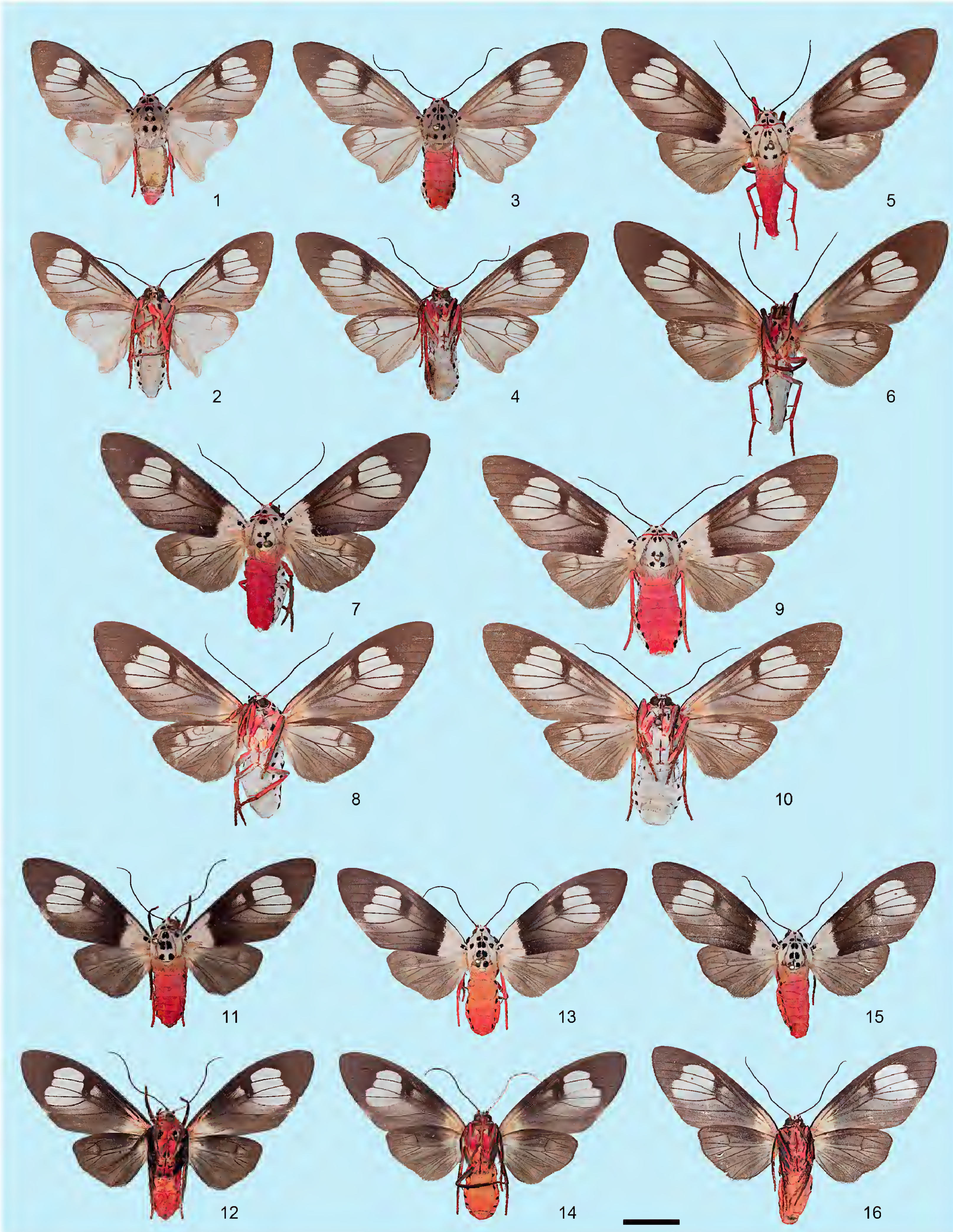


Figures 1-24. Habitus of Papuan Arctiidae. 1-2 – *Spilosoma dinawa* (Bethune-Baker, 1904). 1 – ♀, Papua, Genyem env.; 2 – ditto, underside; 3-6 – *Spilosoma costata* (Boisduval, 1832). 3 – ♂, same locality; 4 – ditto, underside; 5 – ♀, same locality; 6 – ditto, underside; 7-12 – *Spilaethalida turbida* (Butler, 1882). 7 – ♂, Papua, Cyclops Mts.; 8 – ditto, underside; 9 – ♀, same locality; 10 – ditto, underside; 11 – ♂, same locality; 12 – ditto, underside; 13-14 – *Spilosoma styx* (Bethune-Baker, 1910). 13 – ♂, Papua, Dabra env.; 14 – ditto, underside; 15-16 – *Lemyra punctatostrigata* (Bethune-Baker, 1904). 15 – ♂, Papua, Genyem env.; 16 – ditto, underside; 17-24 – *Nicetosoma papuana* (Rothschild, 1910). 17 – ♂, same locality; 18 – ditto, underside; 19 – ♂, Papua, Cyclops Mts.; 20 – ditto, underside; 21 – ♂, Papua, Genyem env.; 22 – ditto, underside; 23 – ♀, Papua, Dabra env.; 24 – ditto, underside [scale bar 10 mm].

Figures 1-24. Habitus of Papuan Arctiidae. 1-4 – *Argina astrea* (Drury, 1773). 1 – ♂, Papua, Cyclops Mts.; 2 – ditto, underside; 3 – ♂, same locality; 4 – ditto, underside; 5-16 – *Utetheisa pellex* (Linnaeus, 1758). 5 – Papua, Genyem env.; 6 – ditto, underside; 7 – same locality; 8 – ditto, underside; 9 – ♀, same locality; 10 – ditto, underside; 11 – same locality; 12 – ditto, underside; 13 – same locality; 14 – ditto, underside; 15 – ♀, same locality; 16 – ditto, underside; 17-24 – *Nyctemera baulus* (Boisduval, 1832). 17 – ♂, Papua, Genyem env.; 18 – ditto, underside; 19 – ♂, same locality; 20 – ditto, underside; 21 – ♀, same locality; 22 – ditto, underside; 23 – same locality; 24 – ditto, underside [scale bar 10 mm].

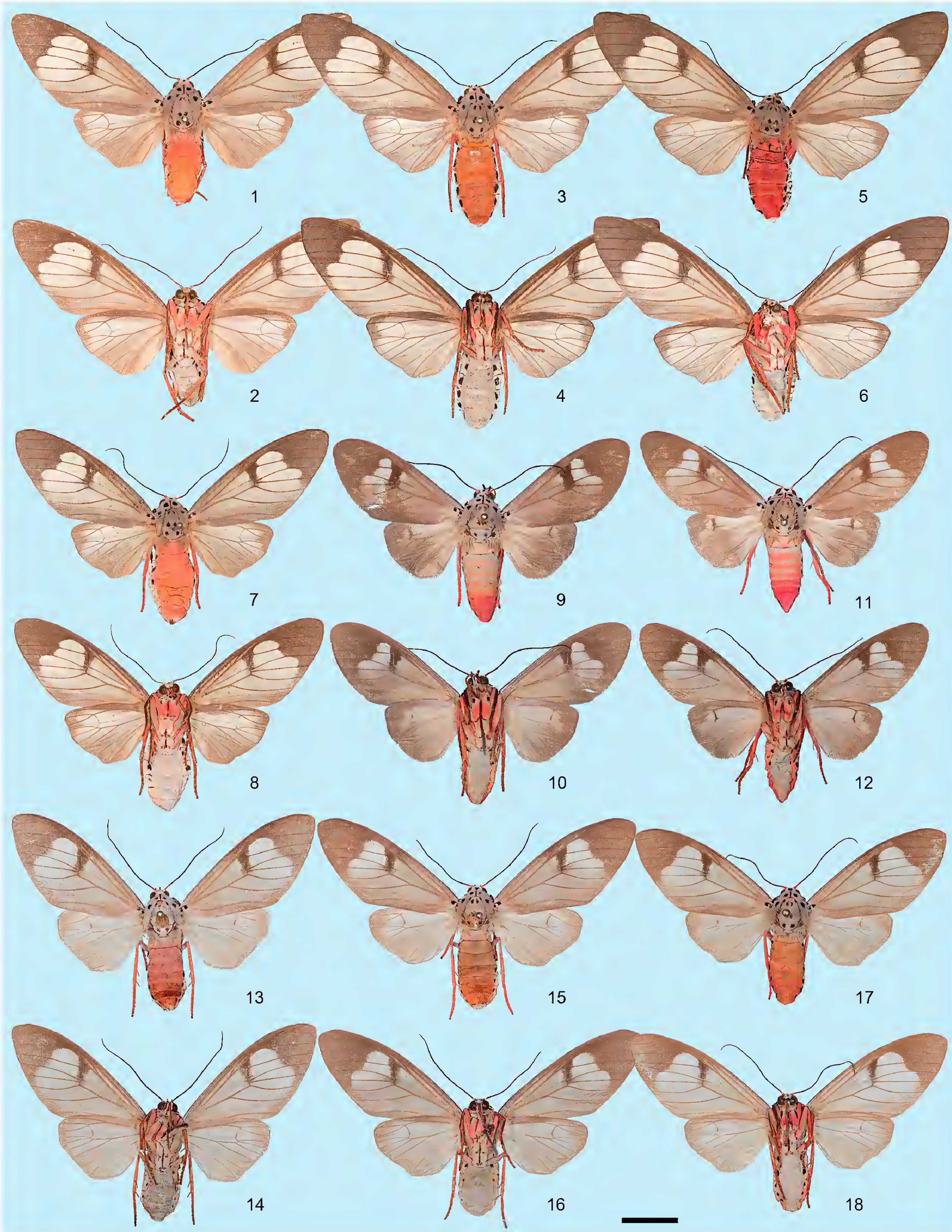
Figures 1-18. Habitus of Papuan Arctiidae. 1-2 – *Nyctemera groenendaeli* De Vos, 1995. 1 – Papua, Genyem env.; 2 – ditto, underside; 3-4 – *Nyctemera latimargo* (Rothschild, 1915). 3 – ♂, Papua, Genyem env.; 4 – ditto, underside; 5-12 – *Nyctemera evergista* (Stoll, 1781). 5 – ♂, Papua, Genyem env.; 6 – ditto, underside; 7 – ♂, same locality; 8 – ditto, underside; 9 – ♂, same locality; 10 – ditto, underside; 11 – ♀, same locality; 12 – ditto, underside; 13-16. *Amerila arthusibertrandi* (Guérin-Méneville, 1831). 13 – ♂, Papua, Genyem env.; 14 – ditto, underside; 15 – same locality; 16 – ditto, underside; 17-18 – *Amerila caudipennis* (Walker, 1864). 17 – ♂, Papua, Genyem env.; 18 – ditto, underside [scale bar 10 mm].

Plate 123



Figures 1-16. Habitus of Papuan Arctiidae. 1-4 – *Amerila caudipennis* (Walker, 1864). 1 – ♂, Papua, Dabra env.; 2 – ditto, underside; 3 – ♀, Papua, Genyem env.; 4 – ditto, underside; 5-10 – *Amerila crokeri* (MacLeay, 1826). 5 – ♂, Papua, Genyem env.; 6 – ditto, underside; 7 – ♂, same locality; 8 – ditto, underside; 9 – ♀, same locality; 10 – ditto, underside; 11-16 – *Amerila nigropunctata* (Bethune-Baker, 1908). 11 – ♂, Papua, Genyem env.; 12 – ditto, underside; 13 – ♂, same locality; 14 – ditto, underside; 15 – ♂, same locality; 16 – ditto, underside [scale bar 10 mm].

Plate 124



Figures 1-18. Habitus of Papuan Arctiidae. 1-8 – *Amerila astreus* (Drury, 1773). 1 – ♂, Papua, Genyem env.; 2 – ditto, underside; 3 – ♀, same locality; 4 – ditto, underside; 5 – ♀, same locality; 6 – ditto, underside; 7 – ♀, same locality; 8 – ditto, underside; 9-18 – *Amerila timolis* (Rothschild, 1914). 9 – ♂, Papua, Genyem env.; 10 – ditto, underside; 11 – ♂, same locality; 12 – ditto, underside; 13 – ♀, same locality; 14 – ditto, underside; 15 – same locality; 16 – ditto, underside; 17 – ♀, same locality; 18 – ditto, underside [scale bar 10 mm].

Plate 125

RÖSLER, H., SCHEIDT, U. & TELNOV, D.: First record of *Cyrtodactylus papuensis* (Brongersma, 1934) ...

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Figures 1-3. *Cyrtodactylus papuensis* (Brongersma, 1934) in its natural environment, at observation site near Aduway village, southern Misool Is., E Indonesia (photo: M. Kalniņš).


1


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Figures 1-2. Riverine forest in River Hakau valley, S Misool Island, E Indonesia - observation spot for *Cyrtodactylus papuensis* (Brongersma, 1934) (photo: D. Telnov).

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