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Revisionen der von Kriechbaumer aus der Westpaläarktis und Zentralasien beschriebenen Ichneumonidae

(Insecta, Hymenoptera)

Klaus Horstmann

Horstmann, K. (2006): Revisions of the species of Ichneumonidae (Insecta, Hymenoptera) described by Kriechbaumer from the western Palearctic Region and central Asia. – Spixiana **29/1:** 1-30

Kriechbaumer described 319 species of Ichneumonidae from the western Palearctic Region and central Asia, which are listed here. Three varieties described by Kriechbaumer, the names of which are considered as available, are also dealt with. The types of the mentioned taxa are revised, or published type revisions are referred to. Those taxa, the types of which were studied by the present author, are marked with an asterisk. Lectotypes are designated for 22 species, and 20 new synonymies are indicated. 22 taxa could not be interpreted, their types being lost. Previous interpretations of *Cryptus gogorzae*, *Erigloea gagatina*, *Euceros superbus*, *Ichneumon imitator*, *I. parvulus*, *I. pertubans*, and *Microcryptus perversus* proved to be incorrect.

Dr. Klaus Horstmann, Lehrstuhl Zoologie III, Biozentrum, Am Hubland, D-97074 Würzburg, Germany.

Einleitung

Obwohl eine Vielzahl von Typen der von Kriechbaumer aus der Westpaläarktis und Zentralasien beschriebenen Arten der Ichneumonidae schon in mehreren umfangreichen Publikationen (Townes et al. 1965, Aubert 1968a, 1974, 1981, Hilpert 1992b, Horstmann & Bordera 1995) und verstreut in vielen verschiedenen Veröffentlichungen (Nachweise bei den einzelnen Taxa) revidiert worden sind, fehlen doch Informationen über zahlreiche weitere Arten, und manche publizierte Revisionen weisen Lücken und Fehler auf. Deshalb wird hier eine Liste aller Arten vorgelegt, mit Revisionen der Arten, über deren Typen bisher nur unzureichende oder keine Informationen vorliegen. Auch drei als Varietäten beschriebene Taxa mit verfügbaren Namen (Horstmann 1997: 48) sind in der Liste enthalten. Neben den aus der Westpaläarktis beschriebenen Arten werden auch solche aus Zentralasien angeführt, weil letztere auch sonst häufig gemeinsam mit Arten aus Europa behandelt werden. Insgesamt werden 322 Taxa besprochen. Alle Arten, deren Typen von mir bei früheren Untersuchungen oder in Zusammenhang mit der vorliegenden Revision revidiert worden sind, sind mit einem Stern hinter dem Autornamen Kriechbaumer gekennzeichnet.

Daß die Revisionen der Arten Kriechbaumers Probleme bereiten, ist zum Teil auf Unzulänglichkeiten dieses Autors zurückzuführen. Zwar sind die von Kriechbaumer publizierten Beschreibungen in der Regel umfangreich und sorgfältig, und die Angaben über die Anzahl der Typen und über die Typenfundorte sind präzise, aber die Etikettierung der Typen ist sehr unvollständig. Kriechbaumer hat nie Typenetiketten und nur selten Nadeletiketten mit Artnamen verwendet. Bei Material, das er von anderen Museen oder Sammlern erhalten und nach der Bearbeitung zurückgeschickt hat, hat er die Typen anscheinend häufig nur mit Nummern etikettiert und die Namen auf Determinationslisten angegeben, die nicht erhalten sind (Horstmann &

Bordera 1995: 49 f., Horstmann 2002: 80). Die Typen sind dann, wenn überhaupt, von den Empfängern der Sendung etikettiert worden. Bei Material in seiner eigenen Sammlung hat er die Namen häufig auf Nadeletiketten angegeben, die nur an dem ersten Tier einer Serie stecken und für die ganze Serie gelten. Deshalb ist mehrfach von einer Serie von Syntypen nur ein Exemplar mit Hilfe eines Namensetiketts identifizierbar, während die anderen Tiere wahrscheinlich unetikettiert waren und beim Umstecken verloren gegangen sind. Gelegentlich steckt das alte Namensetikett an einem Nichttypus. Außerdem sind bei manchen Exemplaren, die von Kriechbaumer und von einigen anderen Sammlern (Hartig, Jemiller, Slaviček) etikettiert worden sind, die Fundorte durch ein System von Zahlen oder selten Farben verschlüsselt. Von Kriechbaumer liegen Tagebücher vor, in denen diese Zahlen entschlüsselt werden, und Kriechbaumer hat einige Fundorte auf zusätzlichen Etiketten auch unverschlüsselt angegeben. Bei dem Material der anderen Sammler ist eine Entschlüsselung nicht möglich, und die Identifikation von Typen bleibt unsicher.

Auch einige der publizierten Revisionen enthalten Unzulänglichkeiten. Mehrere Autoren (insbesondere Aubert) haben sich bei der Identifikation eines Typus oder der Festlegung seines Status (Holotypus oder Lectotypus) nach dem Befund in der Sammlung gerichtet und die Beschreibung nicht verglichen. Dadurch sind Exemplare als Typen akzeptiert worden, die nicht vom Typenfundort stammen oder nicht mit der Beschreibung übereinstimmen, und es sind Exemplare als "Holotypus" oder "Typus" bezeichnet worden, während in der Beschreibung eindeutig auf eine Serie von Syntypen hingewiesen wird. Der letztgenannte Fall ist in Artikel 74.5 der Nomenklaturregeln einigermaßen kompliziert geregelt: Wenn sich die ursprüngliche Beschreibung auf mehrere Syntypen bezieht, bewirkt die Festlegung eines "Typus" die gültige Festlegung eines Lectotypus, die Festlegung eines "Holotypus" ist dagegen ungültig. Die Regelung beider Fälle wird durch Nebenbedingungen ergänzt, die die Anwendung fast willkürlich machen. Ich habe den genannten Artikel ohne Bezug auf Nebenbedingungen angewendet, habe aber, wenn irrtümlich ein Holotypus festgelegt worden war und zwischenzeitlich keine Korrektur erfolgt ist, das entsprechende Exemplar als Lectotypus festgelegt, um die Interpretation der Art zu wahren.

Von einigen Arten fehlen die Typen. Folgende Sammlungen, die Typen von Arten Kriechbaumers enthielten, sind vollständig zerstört: Sammlung Athimus (Diller & Horstmann 1997: 41), Sammlung Munk im Naturhistorischen Museum Augsburg (Hilpert 1992b: 162), Sammlung Tischbein im Zoologischen Museum Hamburg (Weidner 1972: 126, Hilpert 1992b: 14). Die Sammlung Moragues (ursprünglich in Palma de Mallorca, Ichneumonidae jetzt in Madrid) ist teilweise zerstört (Horstmann & Bordera 1995). Auch in anderen Museen sind einzelne Typen unauffindbar und möglicherweise zerstört (Hinweise bei den jeweiligen Arten). Wegen fehlender Typen konnten 22 Arten nicht gedeutet werden.

Typen der von Kriechbaumer beschriebenen Ichneumonidae werden in folgenden Institutionen aufbewahrt: Berlin: Zoologisches Museum; Bern: Naturhistorisches Museum; Bruxelles: Institut Royal des Sciences Naturelles Belgique; Budapest: Természettudományi Múzeum Állattára; Frankfurt: Naturmuseum Senckenberg; Genova: Museo Civico di Storia Naturale; København: Zoologisk Museum; Lund: Zoologiska Institutionen; Madrid: Museo Nacional de Ciencias Naturales; München: Zoologische Staatssammlung; Pretoria: Transvaal Museum, General Entomology Department; Wien: Naturhistorisches Museum.

Revisionen der Arten

Achorocephalus cinctipes **Kriechbaumer, 1899**: 296
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Athimus zerstört.
Gültiger Name: *Eugalta cinctipes* (Kriechbaumer) (Gupta 1985: 324).

Aclastoneura tricolor **Kriechbaumer*, 1896**a: 359 ff.
Holotypus (♀) in Bruxelles (Horstmann 2002: 80).
Gültiger Name: *Proclitus tricolor* (Kriechbaumer) (Townes et al. 1965: 396, Horstmann, l. c.).

Acoenites (Chorischizus) rusticus **Kriechbaumer*, 1896**b: 136
Holotypus (♀): "E-Afrika Oran" (in Algerien), "860/8", "*Acoenites rusticus* n. sp. Kriechb. Algir [!]", Budapest.
Gültiger Name: *Phaenolobus rusticus* (Kriechbaumer) (Meyer 1934: 261 f.).

Acrogonia scutellaris **Kriechbaumer*, 1896**a: 371 f.
Holotypus (♂) in Bruxelles.
Gültiger Name: *Rynchobanchus bicolor* Kriechbaumer (Horstmann 2002: 80).

Acrogonia semirufa **Kriechbaumer*, 1896**a: 370 f.
Holotypus (?) (♀ !) in Bruxelles (Horstmann 2002: 80).
Gültiger Name: *Rynchobanchus bicolor* Kriechbaumer (Townes et al. 1965: 235).

***Aethalodes mesomelas* Kriechbaumer*, 1890**d: 209
Lectotypus (♀) von Townes beschriftet und hiermit festgelegt: "Sièrre 25.6.80. Frey-G." (= Sierre/Valais/CH), "22", "Eur. m. et oc. 1. *nigripennis* Gir. ♀, Kr. (♂, falso ♀.)" (altes Bodenetikett, das anscheinend irrtümlich an den Typus gesteckt wurde), München.
Gültiger Name: *Boethus thoracicus* (Giraud) (Schmiedeknecht 1911-1927: 2397). Ein Paralectotypus (♀) vom Typenfundort ist in München vorhanden, der zweite Paralectotypus (♂) fehlt.

***Aethalodes seminiger* Kriechbaumer*, 1890**d: 208
Holotypus (♂): "Martigny 1-4.6.75. Frey-G." (im Valais/CH), "147", "id. ♂.", München.
Gültiger Name: *Boethus thoracicus* (Giraud) (Schmiedeknecht 1911-1927: 2397).

***Amblyteles albomarginatus* Kriechbaumer*, 1878**a: 45 f.
Holotypus (♂): "*Amblyteles albomarginatus* Kriechb. (typ)", Budapest.
Gültiger Name: *Triptognathus albomarginatus* (Kriechbaumer) (Zwakhals det.) (comb. nov.). Möglicherweise handelt es sich um eine der zahlreichen Varietäten von *T. uniguttatus* (Gravenhorst). Nach der Beschreibung stammt der Typus aus Ungarn, aber dieses umfasste vor dem ersten Weltkrieg auch Kroatien, die Slowakei und Teile von Polen, Rumänien und Serbien.

***Amblyteles bicolor* Kriechbaumer, 1882**a: 240 f.
Holotypus (♀) in München.
Gültiger Name: *Triptognathops bicolor* (Kriechbaumer) (Heinrich 1978: 63, Aubert 1981: 312).

***Amblyteles binotatus* Kriechbaumer*, 1890**b: 350 f.
Lectotypus (♀) hiermit festgelegt: "Mon. 11.10.90. Dürck." (= München), München.
Gültiger Name: *Rhadinodonta flaviger* (Wesmael) (Heinrich 1930b: 119). Aubert (1981: 312) bezeichnet das Exemplar in München als Holotypus; dies ist ungültig (siehe Einleitung). Weitere Syntypen (3♀♀) sind in München unauffindbar.

***Amblyteles carnifex* Kriechbaumer*, 1882**e: 149
Lectotypus (♀) hiermit festgelegt: "Type", "Ala Tau Turkest. Mocsary", "Turkestan *Amblytel. carnifex* Krchb. ♀. /:Mocsary:/" (zum Fundort siehe unter *A. quinquecinctus*), München.
Gültiger Name: *Obtusodonta equitatoria carnifex* (Kriechbaumer) (Heinrich 1929: 319). Aubert (1981: 312) bezeichnet das Exemplar in München als Holotypus; dies ist ungültig (siehe Einleitung). Ein Paralectotypus (♀) befindet sich in Budapest. Dieser wurde von Townes als Lectotypus beschriftet, aber Townes hat seine Festlegung nicht publiziert.

***Amblyteles debilis* Kriechbaumer*, 1886**: 242 f.
Holotypus (♀): "Altvater" (= Praděd-Gebirge/CZ), "♀", "*debilis* Krchb.", "Coll. Wüstnei", København.
Gültiger Name: *Ichneumon ignobilis* Wesmael (Oehlke det.) (syn. nov.).

***Amblyteles erythropygus* Kriechbaumer, 1882**e: 149 f. (praeocc. in *Amblyteles* Wesmael durch *Ichneumon erythropygus* Gravenhorst, 1829)
Holotypus (♀) in Budapest.
Gültiger Name: *Diphyus turcomanus* (Schmiedeknecht) (Townes et al. 1965: 495).

***Amblyteles gratiosus* (Mocsáry in litt.) Kriechbaumer, 1882**e: 150
Holotypus (♀) in Budapest.
Gültiger Name: *Triptognathus gratiosus* (Kriechbaumer) (Townes et al. 1965: 497).

***Amblyteles Isenschmidii* Kriechbaumer, 1887**c: 308
Holotypus (♀) in Bern.
Gültiger Name: *Ichneumon ignobilis* Wesmael (Hilpert 1992b: 312).

***Amblyteles jucundus* (Mocsáry in litt.) Kriechbaumer*, 1882**e: 148
Holotypus (♀): "Mehadia V-VI Pável" (in Rumänien), "*Ambl. jucundus* Kriechb.", "*Amblyteles jucundus* (Mocs. i. l.) Kriechb. (typ.)", Budapest.
Gültiger Name: *Eutanyacra jucunda* (Kriechbaumer) (comb. nov.).

***Amblyteles pandur* Kriechbaumer*, 1882**e: 147 f.
Holotypus (♀): "Mehadia Pável" (in Rumänien), "*Amblyteles pandur* Kriechb.", "*Amblyteles pandur* Kriechb. (typ.)", Budapest.
Gültiger Name: *Thyrateles pandur* (Kriechbaumer) (comb. nov.), syn. *Ambyteles tardus* Berthoumieu (syn. nov.).

***Amblyteles polyxanthus* Kriechbaumer, 1869**: 129 f.
Holotypus (♀) in München.
Gültiger Name: *Ichneumon polyxanthus* (Kriechbaumer) (Aubert 1981: 312, Hilpert 1992b: 101).

***Amblyteles quinquecinctus (5-cinctus)* (Mocsáry in litt.) Kriechbaumer*, 1882**e: 146 f.
Lectotypus (♀) in Budapest.
Gültiger Name: *Diphyus quinquecinctus* (Kriechbaumer) (Heinrich 1978: 54). Der Lectotypus trägt das Fundortetikett "Ala-Tau Turkestan". Das als Turkestan bezeichnete Gebiet gehört jetzt zu Tadzhikistan und Uzbekistan, Ala-Tau heißen mehrere Gebirge.

Amblyteles tauricus **Kriechbaumer, 1888**e: 32
Lectotypus (♀) in Wien.
Gültiger Name: *Ctenichneumon tauricus* (Kriechbaumer) (Aubert 1981: 313).

Amphibulus gracilis **Kriechbaumer, 1893**a: 122
Holotypus (♂) in München unauffindbar (Aubert 1974: 268).
Gültiger Name: *Amphibulus gracilis* Kriechbaumer (Sawoniewicz 1985: 133).

Anisobas buccatus **Kriechbaumer, 1882**a: 241 f.
Lectotypus (♀) in München.
Gültiger Name: *Anisobas buccatus* Kriechbaumer (Heinrich 1980a: 235, Aubert 1981: 313).

Anisobas cephalotes **Kriechbaumer*, 1882**a: 242 f.
Lectotypus (♀) hiermit festgelegt: "Hungar. 28.6.80 (e) Ad Speyer" (ohne nähere Ortsangabe; Ungarn umfaßte vor dem ersten Weltkrieg auch Kroatien, die Slowakei und Teile von Polen, Rumänien und Serbien), "e pup. *Lycaen. Jolae.* [!]", München.
Gültiger Name: *Anisobas cephalotes* Kriechbaumer. Das von Heinrich als Lectotypus beschriftete und von Aubert (1974: 263, 1981: 314) als Holotypus (!) publizierte ♀ trägt die Etiketten "Hungar. 1.6.82 ex Mocsáry" und "*Lycaena jolas* 1/6" und ist kein Syntypus. Dieses Exemplar ist stark beschädigt, während der Lectotypus vollständig erhalten ist. Beide gehören zu derselben Art. Ein weiterer Syntypus (♂) ist in München unauffindbar.

Anomalon (Habronyx) gigas **Kriechbaumer*, 1880**b: 75
Lectotypus (♀) in München (Viktorov & Atanasov 1974: 374).
Gültiger Name: *Habronyx heros* (Wesmael) (Szépligeti 1905: 10). Als Paralectotypen sind in München 4♀♀ etikettiert, von denen 3♀♀ keine Originaletiketten tragen, weshalb ihr Status unklar ist.

Anomalon Oti **Kriechbaumer*, 1895**a: 129
Lectotypus (♀): "Dalmatia *Habronyx Oti* Krchb. ♀." (in Kroatien), München (Atanasov 1977: 41).
Gültiger Name: *Habronyx heros* (Wesmael) (Szépligeti 1905: 10). Der Lectotypus ist von unbekannter Hand als Holotypus etikettiert worden. Dies ist irrig, denn Kriechbaumer gründet seine Beschreibung eindeutig auf mehrere Exemplare ("plura specimina"). Atanasov bezeichnet das Exemplar als "Typus", was als Festlegung eines Lectotypus interpretiert werden kann (siehe Einleitung). Höchstwahrscheinlich gehören weitere 2♀♀ und 2♂♂ zur Typenserie, denn sie tragen Hinweise darauf, daß sie im Jahr 1881 in Dalmatien aus *Pachypasa otus* (Drury) (Lasiocampidae) gezüchtet worden sind, und allen ist ein Kokon des Wirts beigesteckt (wie auch dem Lectotypus). Sie wurden von mir als Paralectotypen etikettiert. Weitere Paralectotypen sind die Typen von *A. gigas* (siehe oben), denn diese müssen Kriechbaumer bei der Beschreibung von *A. oti* vorgelegen haben. Die Beschreibungen beider Taxa sind sehr knapp. Sie sind im Wesentlichen identisch.

Anoplectes multicolor **Kriechbaumer, 1896**a: 364 ff.
Holotypus (♀) in München unauffindbar (Aubert 1968a: 193).
Gültiger Name: *Eclytus multicolor* (Kriechbaumer) (Townes et al. 1965: 99).

Apaeleticus balearicus **Kriechbaumer*, 1894**a: 241
Lectotypus (♀) in Madrid.
Gültiger Name: *Apaeleticus inimicus* (Gravenhorst) (Horstmann & Bordera 1995: 50).

Apaeleticus brevicornis **Kriechbaumer, 1890**b: 203 f.
Holotypus (♀) in München.
Gültiger Name: *Ectopoides brevicornis* (Kriechbaumer) (Heinrich 1973: 56, Aubert 1974: 263).

Arotes annulicornis **Kriechbaumer*, 1894**b: 55 f.
Holotypus (♀): "Tusnád Méhelyi" (= Tusnad/RO), "54.", "*Arotes annulicornis* Kriechb. (typ.)", Budapest.
Gültiger Name: *Arotes annulicornis* Kriechbaumer.

Arotes ustulatus **Kriechbaumer*, 1894**b: 56 f.
Lectotypus (♀) hiermit festgelegt: "Mehádia 1883 Pável" (in Rumänien), "671./11.", "*Arotes ustulatus* Kriechb.", Budapest.
Gültiger Name: *Arotes ustulatus* Kriechbaumer. In Budapest befinden sich außerdem ein Paralectotypus (♂) von Oravita/RO und 2♀♀, die als Typen etikettiert sind, aber höchstwahrscheinlich keinen Typenstatus besitzen (wegen Abweichungen von der Beschreibung oder den Fundortangaben).

Atractogaster semisculptus **Kriechbaumer*, 1872**b: 7 ff.
Holotypus (♀): "Chur 4.6.51. Krchb.", "12234." (auf der Unterseite des Etiketts), "Helvet. 1. *semisculptus* Krchb. ♀.", München.
Gültiger Name: *Atractogaster semisculptus* Kriechbaumer.

Banchopsis graeca **Kriechbaumer*, 1886**: 244 f.
Holotypus (♀): "Graecia", "♀", "Type der Beschreibg Kriechbaumers", "*graeca* Krchb.", "Coll. Wüstnei", København.
Gültiger Name: *Banchopsis crassicornis* Rudow (Townes et al. 1961: 211).

Bassus balearicus **Kriechbaumer*, 1894**a: 246
Lectotypus (♀) in Madrid.
Gültiger Name: *Diplazon laetatorius* (Fabricius) (Horstmann & Bordera 1995: 52).

Bassus ibalioidis **Kriechbaumer*, 1878**b: 211 f.
Holotypus (♀): "Rsh. Hst. 13-23.9.69. Kriechb." (=Hochstätt bei Rosenheim/D), "69/1870.", München.
Gültiger Name: *Phthorima compressa* (Desvignes) (Morley 1906: 436).

Brachycyrtus ornatus **Kriechbaumer, 1880**a: 163 f.
Holotypus (♀) in München unauffindbar (Aubert 1968a: 194).
Gültiger Name: *Brachycyrtus ornatus* Kriechbaumer (Townes et al. 1965: 131). Die Festlegung eines Neotypus durch Aubert (1974: 270) ist nach Artikel 75 der Nomenklaturregeln (Fassung von 1961) ungültig.

Bremia pulchella **Kriechbaumer, 1890**d: 210
Holotypus (♀) in Bern.
Gültiger Name: *Bremiella pulchella* (Kriechbaumer) (Aubert 1969a: 43).

Brischkea parvula **Kriechbaumer*, 1897**a: 167 f.
Lectotypus (♀) hiermit festgelegt: "10/858." (nach der Beschreibung aus Trostberg bei München), "Bavar. 1. *parvula* Krchb. ♀.", München.
Gültiger Name: *Syntactus delusor* (Linnaeus) (Schmiedeknecht 1911-1927: 2616). Die anderen Syntypen (1♀, 1♂) sind in München unauffindbar.

Campoplex lactuosus **Kriechbaumer, 1883**: 104 ff.
Holotypus (♂) in München (Bachmaier 1979: 91).
Gültiger Name: *Dusona confusa* (Förster) (Hinz 1963: 116).

Campoplex auritus **Kriechbaumer, 1883**: 108 ff.
Holotypus (♀) in München (Bachmaier 1979: 91).
Gültiger Name: *Dusona aurita* (Kriechbaumer) (Hinz 1963: 117).

Campoplex Habermehli **Kriechbaumer, 1898**a: 313 f.
Holotypus (♂) in Frankfurt.
Gültiger Name: *Dusona habermehli* (Kriechbaumer) (Hinz 1963: 116).

Campoplex lateralis **Kriechbaumer, 1883**: 111 ff. (praeocc. durch *Campoplex lateralis* Gravenhorst, 1829)
Holotypus (♀) in München (Hinz 1963: 116 f., Bachmaier 1979: 91).
Gültiger Name: *Dusona alpina* (Strobl) (Yu & Horstmann 1997: 142).

Campoplex limiventris **Kriechbaumer, 1883**: 106 ff.
Holotypus (♂) in München (Bachmaier 1979: 92).
Gültiger Name: *Dusona obliterata* (Holmgren) (Hinz 1963: 116).

Campoplex punctus **Kriechbaumer*, 1883**: 101 ff.
Holotypus (♂) in München (Bachmaier 1979: 92).
Gültiger Name: *Dusona rugifer* (Förster) (Hinz 1963: 116).

Canidia balearica **Kriechbaumer, 1894**a: 253
Syntypen (? Holotypus) (♂♂) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Taxon uninterpretiert (Horstmann & Bordera 1995: 54).

Casinaria carinata **Kriechbaumer*, 1898**b: 172
Holotypus (♂): "*Limneria pictipes* [!] 103 col. Gogorza Santander", "*Casinaria carinata* m. ♂." (Kopf und große Teile der Beine fehlen), Madrid.
Gültiger Name: *Alcima orbitalis* (Gravenhorst) (syn. nov.). Bei der in der Beschreibung erwähnten Längskante auf dem zweiten bis sechsten Gastertergit handelt es sich um eine Mißbildung.

Casinaria parvula **Kriechbaumer,1894**a: 253.
Syntypen (? Holotypus) (♀♀) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Taxon uninterpretiert (Horstmann & Bordera 1995: 54).

Coleocentrus exareolatus **Kriechbaumer*, 1894**b: 59
Holotypus (♀): grünes rechteckiges Etikett ohne Beschriftung, "Görgény Horwáth" (= Gurghiu/RO), "*Coleocentrus exareolatus* Kriechb (typ)", Budapest.
Gültiger Name: *Coleocentrus exareolatus* Kriechbaumer. In Budapest ist zusätzlich 1♂ von Borosjenö (=Ineu/RO) als Typus beschriftet, das von Kiss (1924: 95) als *C. exareolatus* determiniert worden ist. Dieses ♂ gehört zu *C. excitator* (Poda) und besitzt keinen Typenstatus.

Cryptus balearicus **Kriechbaumer, 1894**a: 242
Syntypen (? Holotypus) (♀♀) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Gültiger Name: *Meringopus nigerrimus* (Boyer de Fonscolombe) (Horstmann & Bordera 1995: 51).

Cryptus Bolivari **Kriechbaumer*, 1898**b: 168
Holotypus (♀): "*Cryptus attentatorius* [!] c. Gogorza 106 Escorial" (in Spanien), "*Cryptus Bolivari* m. ♀.", Madrid.
Gültiger Name: *Cryptus triguttatus* Gravenhorst (Bordera det.) (syn. nov.). Der Typus besitzt ein schwarzes Scutellum sowie schwarzbraune Mittelfemora und Hinterbeine, stimmt aber sonst mit

C. triguttatus gut überein. Exemplare mit ähnlich dunklen Beinen kommen auch in Mitteleuropa vor, aber bei ihnen ist das Scutellum weiß gezeichnet. Es ist unklar, ob dieser Unterschied von Bedeutung ist.

Cryptus Gogorzae **Kriechbaumer*, 1898**b: 168
Holotypus (♂): "Col Gogorza 79. Escorial" (in Spanien), "*Cryptus Gogorzae* m. ♂.", Madrid.
Gültiger Name: *Cryptus gogorzae* Kriechbaumer, syn. *C. ebriolus* Seyrig (Ceballos 1931: 48). Lectotypus (♀) von *C. ebriolus* hiermit festgelegt: "El Soldado Sierra-Morena 25.4.26 Seyrig", "*Cryptus ebriolus* m. ♀ det. A. Seyrig", Madrid. Ein Paralectotypus (♂) von *C. ebriolus* ist in Madrid ebenfalls vorhanden. Ceballos hat die Typen beider Taxa revidiert und beschrieben, allerdings bildet er den Kopf des ♂ (nicht des ♀) ab. Van Rossem (1969: 338) hat die Typen nicht erhalten und beschreibt stattdessen 1♂ aus Spanien (Museum Leiden) unter dem Namen *C. gogorzae*. Dieses ♂ gehört wahrscheinlich zu einer unbeschriebenen Art. Der echte *C. gogorzae* ist in der Revision von van Rossem nicht enthalten. Die Bestimmung des ♂ führt zu *C. titubator* (Thunberg); *C. gogorzae* weicht ab durch: Augen-Ocellen-Abstand 0,8-0,9-mal so groß wie der Durchmesser eines Lateralocellus, Stirn überwiegend deutlich gerunzelt, Tyloide an den Geißelgliedern 14/15 bis 20, Gaster schwarz. Die Bestimmung des ♀ führt zu *C. apparitorius* (Villers); *C. gogorzae* weicht ab durch: Bohrerklappen 0,65-mal so lang wie ein Vorderflügel, Thorax, Coxen und Gaster schwarz.

Cryptus heraldicus **Kriechbaumer* in Schletterer, 1894**: 12 f.
Holotypus (♂) in Wien.
Gültiger Name: *Aritranis longicauda* (Kriechbaumer) (Aubert 1974: 264, Horstmann 1990: 80).

Cryptus longicauda **Kriechbaumer*, 1873**: 49 ff.
Lectotypus (♀) in München.
Gültiger Name: *Aritranis longicauda* (Kriechbaumer) (Aubert 1974: 264, Horstmann 1990: 80).

Cryptus nigritarsis **Kriechbaumer*, 1894**c: 45 f.
Lectotypus (♂) in Pretoria.
Gültiger Name: *Cryptus nigritarsis* Kriechbaumer (van Rossem 1989: 254).

Cryptus Turkestanicus **Kriechbaumer, 1882**e: 150
Holotypus (♂) in Budapest unauffindbar (Aubert 1968a: 193).
Gültiger Name: *Buarthra laborator* (Thunberg) (Horstmann & Yu 1999: 81).

Ctenopelma Athimi **Kriechbaumer, 1896**a: 362 f.
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Athimus zerstört.
Gültiger Name: *Ctenopelma tomentosum* (Desvignes) (Roman 1931: 19, Aubert 2000: 102). Teunissen (1948: 23) hat *C. athimi* nach Material in seiner Sammlung von *C. luteum* Holmgren (recte: *C. tomentosum*) getrennt. Dieses Material ist im Museum Leiden vorhanden, und es gehört zu *C. tomentosum*.

Diphyes **(!)** ***tricolor*** **Kriechbaumer, 1890**b: 184 f.
Holotypus (♀) in München.
Gültiger Name: *Diphyus tricolor* Kriechbaumer (Heinrich 1978: 43, Aubert 1981: 314).

Enoecetis scutellaris **(Förster in litt.) Kriechbaumer*, 1897**a: 175 f.
Lectotypus (♀) hiermit festgelegt: "M. Pasing 28.5.70. Krchb." (= München-Pasing), "70./738.", München.
Gültiger Name: *Himerta scutellaris* (Kriechbaumer) (Townes et al. 1965: 260). In München ist auch ein Paralectotypus (?♀) vorhanden. Das hier als Lectotypus festgelegte Exemplar ist von unbekannter Hand als "Paratypus" etikettiert worden, der Paralectotypus als "Holotypus". Da diese Festlegung nicht publiziert ist, ist sie nicht bindend. Der Lectotypus ist weniger stark beschädigt, und das Geschlecht ist eindeutig zu erkennen.

Ephialtes arundinis **Kriechbaumer*, 1887**a: 65 f. (!)
Lectotypus (♀) in München (Townes et al. 1965: 9).
Gültiger Name: *Exeristes arundinis* (Kriechbaumer) (Townes & Townes 1960: 11). Kriechbaumer hat die Art in einer bisher nicht beachteten Arbeit flüchtig, aber zweifellos gültig beschrieben. Andere Autoren zitieren nur eine zweite, viel ausführlichere Beschreibung (Kriechbaumer 1887b: 253 f.). Da in dieser in einer Fußnote auf die erste Beschreibung hingewiesen wird, wird in der zweiten Beschreibung kein neues Taxon eingeführt, sondern die erste Beschreibung erweitert. Da die erste Beschreibung keine näheren Angaben über die Typen enthält, wird zu deren Identifikation die zweite Beschreibung herangezogen. In München ist zusätzlich ein Paralectotypus (♀) vorhanden, vermutlich eins der Exemplare aus der Sammlung Hiendlmayr.

Ephialtes geniculatus **Kriechbaumer, 1896**b: 135 (praeocc. durch *E. geniculatus* Brischke, 1865)
Lectotypus (♀) in München (Oehlke 1967: 11).
Gültiger Name: *Dolichomitus kriechbaumeri* (Schulz) (Schulz 1906: 115, Shaumar 1966: 444).

Ephialtes imperator **Kriechbaumer*, 1854**: 156
Lectotypus (♀) von Perkins beschriftet und hiermit

festgelegt: "3506.", "Tegernsee *Ephialtes imperator* mihi. ♀", München.
Gültiger Name: *Dolichomitus imperator* (Kriechbaumer) (Townes & Townes 1960: 154). Als Paralectotypen können in München 3♀♀ und 1♂ von Chur/CH identifiziert werden.

***Ephialtes macrocentrus* Kriechbaumer, 1896**b: 134 f.
Lectotypus (♀) in München (Oehlke 1967: 12).
Gültiger Name: *Dolichomitus atratus* (Rudow) (Perkins 1943: 255).

***Ephialtes rex* Kriechbaumer*, 1854**: 156 f.
Lectotypus (♀) hiermit festgelegt: "v. Siebold" (nach der Beschreibung aus Danzig = Gdansk/PL), "*Ephialtes mesocentrus* ♀ (Gr. ♂) m.", Coll. Thomson/Lund.
Gültiger Name: *Dolichomitus mesocentrus* (Gravenhorst) (Kriechbaumer 1887b: 251 f.). Kriechbaumer hat die Art ursprünglich nach 6♀♀ beschrieben, und zwar 4♀♀ aus der Sammlung von Siebold und 2♀♀ aus Südbayern. Später stellt er 1♀ aus Südbayern zu *E. manifestator* auct. (recte: *Dolichomitus imperator* (Kriechbaumer)), das zweite ♀ aus Südbayern ist nicht mehr vorhanden, und die verbleibenden 4♀♀ bilden die eigentliche Art *E. rex* und werden zu *E. mesocentrus* Gravenhorst gestellt (Kriechbaumer 1887b: 251 f.). Von letzteren war nur der Lectotypus auffindbar, und zwar in einer kleinen Serie von *Dolichomitus*-Arten, die Kriechbaumer an Thomson geschickt hat und die sich in dessen Dublettensammlung befindet.

***Erigloea fulvicornis* Kriechbaumer*, 1891**b: 300 f.
Holotypus (♀): "Teg. 7.6.65. A. Krchb." (=Tegernsee/D), München.
Gültiger Name: *Xenoschesis* (*Polycinetis*) *fulvicornis* (Kriechbaumer) (Schmiedeknecht 1911-1927: 2648 f.). Aubert (1992: 1 f.) bezeichnet den Holotypus als Lectotypus. Kriechbaumer hat aber das zweite von ihm erwähnte Exemplar (1♀ aus der Sammlung Hartig) nur mit Bedenken zu der Art gestellt; dieses ist deshalb kein Syntypus (Artikel 72.4.1 der Nomenklaturregeln). Es gehört meines Erachtens zu *X. ustulata* (Desvignes). Roman (1909: 312 f.) hat die europäischen Arten der Untergattung *Polycinetis* Förster zu einer Art *X. resplendens* (recte: *X. ustulata*) vereinigt, weil die zur Unterscheidung verwendeten Farbmerkmale variieren. Letzteres bestätigt sich bei einer Durchsicht des Materials in der Sammlung Hinz/München (ebenso Aubert 2000: 109). Es bleibt aber ein Unterschied in der Form der Bohrerklappen (Abb. 1-2), auf den bereits Kriechbaumer hingewiesen hat. Deshalb werden hier, wie bei Aubert, zwei Arten unterschieden. Für die ♂♂ ist bisher kein Unterscheidungsmerkmal bekannt.

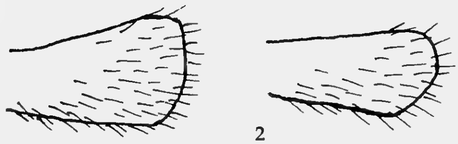

Abb. 1-2. Bohrerklappen. **1.** *Xenoschesis fulvicornis* (Kriechbaumer). **2.** *X. ustulata* (Desvignes).

***Erigloea gagatina* Kriechbaumer*, 1891**b: 300
Holotypus (♀): "Teg. 10.6.89 Krchb." (=Tegernsee/D), "89./147.", "Bavar. 2. *gagatina* m. ♀."
Gültiger Name: *Xenoschesis (Polycinetis) fulvicornis* (Kriechbaumer) (syn. nov.). Aubert (2000: 109) stellt diese Art zu *X. resplendens* (recte: *X. ustulata*), aber meines Erachtens sind die Bohrerklappen bei dem Typus von *X. gagatina* wie bei *X. fulvicornis* geformt. Dies steht im Widerspruch zur Beschreibung Kriechbaumers, und wegen dieser Ungenauigkeit hat Heinrich (1953: 164) die Art *E. gagatina* anders definiert als es hier geschieht.

***Erigloea polita* (Förster in litt.) Kriechbaumer*, 1891**b: 299 f.
Lectotypus (♀) hiermit festgelegt: "specimen typicum Försteri.", "*Erigloea* m (Tryphonoidae) *polita* m. ♀.", "German. 1. *polita* (Frst. i. c.) m. ♀." (Fundort unbekannt; die Angabe "German." beruht auf einer Vermutung), München.
Gültiger Name: *Xenoschesis (Polycinetis) ustulata* (Desvignes) (Strobl 1903: 45, Aubert 2000: 109, Shaw et al. 2003: 140). Der Paralectotypus (♂) aus der Sammlung Förster (ebenfalls ohne Fundortangabe) ist in München vorhanden.

***Erigorgus Apollinis* Kriechbaumer, 1900**a: 174 f.
Lectotypus (♀) in München (Aubert 1974: 271).
Gültiger Name: *Erigorgus apollinis* Kriechbaumer (Schnee 1989: 264).

***Erigorgus purpuratae* Kriechbaumer, 1900**a: 172 ff.
Syntypen (2♀♀, 1♂) in Berlin und München unauffindbar (Aubert 1974: 271 f.).
Taxon uninterpretiert. Schmiedeknecht (1903: 6) hat *E. purpuratae* mit *E. interstitialis* Szépligeti und Móczár (1968: 187) hat letztere Art mit *E. melanops* (Förster) synonymisiert. Mindestens eine dieser Synonymisierungen muß inkorrekt sein, weil die Typen von *E. purpuratae* aus *Rhyparia purpurata* (Linnaeus) (Arctiidae) gezogen worden sind (Kriechbaumer, l. c., Pfankuch 1901: 155 f.), während *E. melanops* an verschiedenen Noctuidae parasitiert (Schnee 1986: 280, 1991: 80 ff.). Die Interpretation von *E. purpuratae* hängt von neuen Zuchtergebnissen ab.

***Eryma stygium* (Förster in litt.) Kriechbaumer, 1891**b: 301 ff.
Lectotypus (♀) in München
Gültiger Name: *Ctenopelma nigrum* Holmgren (Aubert 1985: 53, 2000: 103).

***Euceros superbus* Kriechbaumer, 1888**a: 199 f.
Holotypus (♀) in München unauffindbar.
Gültiger Name: *Euceros superbus* Kriechbaumer, syn. *E. sapporensis* Uchida var *kiushuensis* Uchida (syn. nov.). Aubert (1966a: 82) hat in München 1♂ (!) als Lectotypus (!) festgelegt, das von Kriechbaumer (1888c: 353 f.) erst in einer späteren Publikation beschrieben worden ist und deshalb keinen Typenstatus besitzt. Es trägt die Etiketten "3.VII.88" (Originaletikett), "*Euceros superbus* Kriechb.", "Möglicherweise die Type Kriechb." (beide Etiketten von unbekannter Hand später zugefügt) und eine leere Schmetterlingspuppe und gehört zu *E. pruinosus* (Gravenhorst). Barron (1978: 332) hat seine Interpretation der Art auf diesen Nichttypus gestützt und *E. superbus* deshalb mit *E. pruinosus* synonymisiert. Der Holotypus war dagegen 1♀ und ist am 24.5.1884 in Gauting bei München gefangen worden. Nach der Orginalbeschreibung handelt es sich eindeutig um die Art, die Barron unter dem Namen *E. kiushuensis* beschrieben hat (nach einem von Barron determinierten ♀ in München).

***Euryproctus Foersteri* Kriechbaumer*, 1897**a: 165 ff.
Holotypus (♂) in München.
Gültiger Name: *Euryproctus nemoralis* (Geoffroy) (Horstmann 2002: 86).

***Euryproctus sexannulatus (6-annulatus)* Kriechbaumer*, 1891**b: 41 f.
Holotypus (♀) in München.
Gültiger Name: *Himerta sepulchralis* (Holmgren) (Horstmann 2001b: 78).

***Exenterus fulvipes* Kriechbaumer*, 1896**a: 369
Holotypus (♂) in Bruxelles.
Gültiger Name: *Eridolius rufonotatus* (Holmgren) (Kerrich 1952: 437).

***Exephanes* (?) *caelebs* Kriechbaumer*, 1890**c: 289 f.
Holotypus (♂) in København.
Gültiger Name: *Exephanes venustus* (Tischbein) (Hinz & Horstmann 2000: 23).

***Exephanes uniguttatus* Kriechbaumer, 1895**b: 104 f.
Syntypen (1♀, 1♂) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört (Aubert 1968a: 193, Hinz & Horstmann 2000: 19).
Gültiger Name: *Exephanes occupator* (Gravenhorst) (Hellén 1941: 43).

***Exetastes albiger* Kriechbaumer*, 1886**: 145 f.
Lectotypus (♀) von Aubert (1978: 137) festgelegt: "Zara 10.5.85. Gaiger" (=Zadar/Kroatien), "Zara 10/5 85. Gaiger Wüstnei", "Dalmat. *albiger* Krchb. ♀", München.
Gültiger Name: *Exetastes albiger* Kriechbaumer. Townes et al. (1965: 226) haben angegeben, daß die Typen der Art (1♀, 1♂) in München seien, und Aubert hat auf einen von Townes beschrifteten Lectotypus hingewiesen, was letzterer aber nicht publiziert hat. In München befindet sich auch ein Paralectotypus (♂). Weitere Exemplare (1♀, 1♂) der Art von demselben Sammler (Gaiger, Zadar) befinden sich in København, davon trägt eins die Wirtsangabe *Hemaris croatica* (Esper) (Sphingidae). Da Kriechbaumer den Wirt nicht erwähnt, hat er diese Tiere vermutlich nicht gesehen.

***Exetastes alpinus* Kriechbaumer*, 1888**d: 354 f.
Lectotypus (♀) von Aubert (1978: 146) festgelegt: "Oberalp 16.7.79." (bei Andermatt/CH), "*Ex. laevigator* var. *nigriventris* Kr. [!] ♀ J. Kriechbaumer det." (Kopf, Vorderbeine und Teile des Thorax fehlen), München.
Gültiger Name: *Exetastes laevigator* (Villers) (Aubert, l. c.). Als Paralectotypen sind 1♀ und 1♂ in München vorhanden.

***Glypta ephippigera* Kriechbaumer*, 1895**c: 262 f.
Holotypus (♂): "Niouc 21.V.90." (Valais/CH), "Wallis Paul, 1880/97 Museum Bern", Bern.
Gültiger Name: *Glypta cylindrator* (Fabricius) (Aubert 1978: 55 f.).

***Glypta exophthalmus* Kriechbaumer*, 1887**b: 85 f.
Holotypus (♀) in München.
Gültiger Name: *Glypta exophthalmus* Kriechbaumer (Bauer 1927: 425, Aubert 1978: 40).

***Glypta paleanae* Kriechbaumer, 1900**b: 121 f.
Syntypen (1♀, 3♂♂) in Helsinki und München unauffindbar.
Gültiger Name: *Glypta cylindrator* (Fabricius) (Aubert 1978: 55 f.). Aubert gibt an, die Typen von *G. paleanae* seien im Museum Helsinki gefunden worden. Derzeit sind sie aber verschollen (Albrecht, in litt.).

***Glypta rufiventris* Kriechbaumer*, 1894**a: 249.
Lectotypus (♀) in München (Aubert 1978: 49, Horstmann & Bordera 1995: 53).
Gültiger Name: *Glypta rufiventris* Kriechbaumer.

***Goniocryptus parvulus* Kriechbaumer*, 1894**a: 243
Lectotypus (♂) in München.
Gültiger Name: *Trychosis legator* (Thunberg) (Aubert

1974: 265, Horstmann & Bordera 1995: 51). Aubert hat den Lectotypus fälschlich als Holotypus bezeichnet.

***Griphodes caligatus* Kriechbaumer*, 1894**b: 57 f.
Holotypus (♂): "Budap. ..." (= Budapest), "*Griphodes caligatus* Kriechb. det. Kriechb. Typus", Budapest (große Teile der Geißeln fehlen, der Gaster ist abgebrochen und auf ein Etikett geklebt).
Gültiger Name: *Phobetes caligatus* (Kriechbaumer) (Townes 1970: 137).

***Hadrodactylus insignis* Kriechbaumer, 1891**b: 141
Lectotypus (♂) in München.
Gültiger Name: *Hadrodactylus insignis* Kriechbaumer (Idar 1975a: 187).

***Hadrodactylus intrepidus* (Förster in litt.) Kriechbaumer*, 1891**b: 303
Lectotypus (♂) in München.
Gültiger Name: *Hadrodactylus femoralis* (Holmgren) (Horstmann 2000b: 44).

***Hadrodactylus larvatus* Kriechbaumer, 1891**b: 139 f.
Lectotypus (♂) in München.
Gültiger Name: *Hadrodactylus larvatus* Kriechbaumer (Idar 1975b: 293).

***Hemicryptus tener* Kriechbaumer*, 1893**a: 152 f.
Holotypus (♀) in München (Aubert 1968a: 193, 1974: 270).
Gültiger Name: *Micromonodon tener* (Kriechbaumer) (Horstmann 1976: 26).

***Heterolabis aberrans* Kriechbaumer*, 1889**a: 21 f.
Holotypus (♀): unbeschriftetes blaues dreieckiges Etikett (= aus Coll. Hartig) (nach der Beschreibung aus Süddeutschland oder der Steiermark/A), "German. 2. *aberrans* m. ♀.", München.
Gültiger Name: *Procinetus decimator* (Gravenhorst) (Strobl 1902: 38).

***Heterolabis crassula* Kriechbaumer*, 1889**a: 19 f.
Lectotypus (♀) hiermit festgelegt: "M. Schl. 7.6.68. A. Krchb." (= München-Schleißheim), "68./263.", München.
Gültiger Name: *Procinetus decimator* (Gravenhorst) (Strobl 1902: 38). Als Paralectotypen sind in München 3♀♀ und 2♂♂ vorhanden.

***Heterolabis crudelis* Kriechbaumer*, 1896**a: 372
Holotypus (♂) in Bruxelles (Horstmann 2002: 80).
Gültiger Name: *Procinetus crudelis* (Kriechbaumer) (Schmiedeknecht 1900: 328).

***Heterolabis marginata* Kriechbaumer, 1889**a: 23 f.
Holotypus (♀) in München (Aubert 1968a: 192).
Gültiger Name: *Leptacoenites notabilis* (Desvignes) (Strobl 1902: 40, Yu & Horstmann 1997: 22).

***Heterolabis petiolata* Kriechbaumer*, 1889**a: 22 f.
Holotypus (♀): "Wallbg. 12.8.53. Krchb." (= Wallberg am Tegernsee/D), "3567." (auf der Rückseite des Etiketts), "Bavar. 3. *petiolata* m. ♀.", München.
Gültiger Name: *Leptacoenites notabilis* (Desvignes) (Schmiedeknecht 1900: 327, Yu & Horstmann 1997: 22).

***Holmgrenia pulchra* Kriechbaumer*, 1877**: 148 ff.
Holotypus (♀): "Teg. 3.7.54. Kriechb." (= Tegernsee/D), "5361.", München.
Gültiger Name: *Ctenopelma tomentosum* (Desvignes) (Schmiedeknecht 1911-1927: 2636, Roman 1914: 18, Aubert 2000: 102, Shaw at al. 2003: 138).

***Homoporus bifoveolatus* Kriechbaumer*, 1894**a: 246 f.
Lectotypus (♂) in Madrid.
Gültiger Name: *Syrphoctonus signatus* (Gravenhorst) (Horstmann & Bordera 1995: 52). Ein Paralectotypus (♂) befindet sich in München; er gehört zu derselben Art.

***Hoplismenus cornix* Kriechbaumer, 1890**a: 481
Holotypus ♂) in Wien (Aubert 1981: 313).
Gültiger Name: *Hoplismenus cornix* Kriechbaumer.

***Hoplocryptus gladiator* Kriechbaumer, 1899**: 70 f.
Holotypus (♀) in München.
Gültiger Name: *Hoplocryptus confector* (Gravenhorst) (Habermehl 1925-1926: 166, Aubert 1974: 266).

***Hoplocryptus Mallorcanus* Kriechbaumer, 1894**a: 243
Syntypen (? Holotypus) (♀♀) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Gültiger Name: *Hoplocryptus fugitivus* (Gravenhorst) (Aubert 1974: 266, Horstmann & Bordera 1995: 51).

***Ichneumon acosmus* Kriechbaumer, 1880**c: 14 f.
Holotypus (♂) in München.
Gültiger Name: *Ichneumon acosmus* Kriechbaumer (Aubert 1981: 306, Hilpert 1992b: 266).

***Ichneumon alpicola* Kriechbaumer, 1872**a: 482 f.
Lectotypus (♀) in München.
Gültiger Name: *Stenichneumon alpicola* (Kriechbaumer) (Aubert 1981: 306, Hilpert 1992b: 138).

***Ichneumon altipeta* Kriechbaumer, 1887**c: 303 f.
Holotypus (♀) in Bern (Aubert 1981: 306).

Gültiger Name: *Ichneumon cerinthus* Gravenhorst (Hilpert 1992b: 219).

***Ichneumon* (*Exephanes* ?) *amabilis* Kriechbaumer*, 1895**b: 105 ff. (praeocc. durch *I. amabilis* Giraud, 1863)
Lectotypus (♂) in München.
Gültiger Name: *Exephanes riesei* (Habermehl) (Hinz & Horstmann 2000: 21). Aubert (1981: 313) hat den Lectotypus fälschlich als Holotypus bezeichnet.

***Ichneumon amphibolus* Kriechbaumer, 1888**e: 26 f.
Holotypus (♀) in Wien.
Gültiger Name: *Ichneumon amphibolus* Kriechbaumer (Aubert 1981: 306, Hilpert 1992b: 307).

***Ichneumon Antonii* Kriechbaumer*, 1898**a: 309 ff.
Holotypus (♂): "Meran 1897. *I. Antonii* m. ♂. /:Anton:/." (in Südtirol/I), "Bavar. [!] 214. *albipictus* (Gr. ♂) W. ♀." (altes Bodenetikett, das anscheinend irrtümlich an den Typus gesteckt wurde), München.
Gültiger Name: *Melanichneumon spectabilis* (Holmgren) (syn. nov.). Meines Erachtens stellt der Holotypus eine melanistische Varietät dieser Art dar: Seiten des Clypeus, Schläfen unten, Pronotum dorsolateral, Postscutellum und sechstes Gastertergit nicht weiß gezeichnet, Scutellum nur lateral weißgelb.

***Ichneumon argali* Kriechbaumer*, 1882**a: 123
Lectotypus (♀) in München (Hilpert 1992b: 269).
Gültiger Name: *Ichneumon erythromerus* Wesmael (Horstmann 2003: 26).

***Ichneumon aries* Kriechbaumer, 1875**: 152 f. (praeocc. durch *I. aries* Christ, 1791).
Lectotypus (♀) in München.
Gültiger Name: *Ichneumon alius* Tischbein (Townes et al. 1965: 460, Hilpert 1992b: 194). Aubert (1981: 306) hat den Lectotypus fälschlich als Holotypus bezeichnet.

***Ichneumon balearicus* Kriechbaumer*, 1894**a: 240
Holotypus (♀) in München.
Gültiger Name: *Virgichneumon digrammus* (Gravenhorst) (Aubert, 1974: 263, Horstmann & Bordera 1995: 50).

***Ichneumon basiglyptus* Kriechbaumer, 1890**c: 294
Holotypus (♀) in München.
Gültiger Name: *Stenobarichneumon basiglyptus* (Kriechbaumer) (Aubert 1974: 263).

***Ichneumon biguttulatus* Kriechbaumer, 1875**b: 150 ff.
Holotypus (♀) in München.
Gültiger Name: *Coelichneumon biguttulatus* (Kriechbaumer) (Aubert 1981: 306).

***Ichneumon capito* Kriechbaumer, 1872**a: 484 f.
Holotypus (♀) in München.
Gültiger Name: *Ulesta perspicua* (Wesmael) (Heinrich 1930a: 90, Aubert 1981: 307).

***Ichneumon cinctor* Kriechbaumer, 1894**b: 48 f.
Holotypus (♂) in Budapest.
Gültiger Name: ? *Thyrateles haereticus* (Wesmael) (Hilpert 1992b: 32 f.).

***Ichneumon Cinxiae* Kriechbaumer, 1890**a: 480
Holotypus (♀) in Wien.
Gültiger Name: *Ichneumon cinxiae* Kriechbaumer (Aubert 1981: 307, Hilpert 1992b: 102).

***Ichneumon cordiger* Kriechbaumer*, 1882**e: 145 f.
Lectotypus (♂) in München.
Gültiger Name: *Vulgichneumon cordiger* (Kriechbaumer) (Hinz & Horstmann 2000: 31). Aubert (1981: 307) bezeichnet den Lectotypus fälschlich als Holotypus; dies ist ungültig (siehe Einleitung). In Budapest befindet sich ein Paralectotypus (♂), der von Aubert ebenfalls als Lectotypus etikettiert worden ist. Beide Exemplare gehören zu derselben Art. Kriechbaumer beschreibt zusätzlich mindestens 1 ♀. Dieses befand sich vermutlich in Budapest (nach einem Hinweis auf einem Etikett des dort vorhandenen ♂), ist aber zur Zeit unauffindbar.

***Ichneumon Corsus* Kriechbaumer, 1888**e: 23
Holotypus (♀) in Wien (Aubert 1981: 307).
Gültiger Name: *Ichneumon sarcitorius corsus* Kriechbaumer (Hilpert 1992b: 90).

***Ichneumon crassigena* Kriechbaumer, 1890**b: 152 f.
Holotypus (♀) in München (Aubert 1981: 307, Hilpert 1992b: 184).
Gültiger Name: *Ichneumon haemorrhoicus crassigena* Kriechbaumer (Yu & Horstmann 1997: 602).

***Ichneumon curtulus* Kriechbaumer, 1882**e: 144
Holotypus (♀) in Budapest.
Gültiger Name: *Ichneumon curtulus* Kriechbaumer (Hilpert 1992b: 228).

***Ichneumon cynthiae* Kriechbaumer, 1888**e: 24
Holotypus (♀) in Wien.
Gültiger Name: *Ichneumon cynthiae cynthiae* Kriechbaumer (Aubert 1981: 307, Hilpert 1992b: 105).

***Ichneumon declinans* Kriechbaumer, 1897**a: 120 ff.
Syntypen (1♀, 1♂) höchstwahrscheinlich in Graz zerstört (Townes 1961: 169).
Taxon uninterpretiert. Das von Aubert (1981: 307) unter diesem Namen erwähnte ♀ in Wien gehört zu *Sycaonia foersteri* (Wesmael). Es stimmt mit der Be-

schreibung von *I. declinans* nicht überein und kann zur Interpretation der Art nicht herangezogen werden.

Ichneumon Freyi **Kriechbaumer, 1880**c: 12 f.
Holotypus (♀) in München.
Gültiger Name: *Ichneumon freyi* Kriechbaumer (Aubert 1981: 307, Hilpert 1992b: 205).

Ichneumon fulvidactylus **Kriechbaumer, 1894**b: 52
Holotypus (♂) in Budapest.
Gültiger Name: ? *Diphyus bicingulatus* (Gravenhorst) (Hilpert 1992b: 318 f.).

Ichneumon Gerstaeckeri **Kriechbaumer, 1889**b: 142 ff.
Holotypus (♂) in München unauffindbar.
Gültiger Name: *Coelichneumon opulentus* (Taschenberg) (Kriechbaumer 1892e: 292). Der Holotypus ist von Gerstäcker in Golling/Salzburg/A gefangen worden, und in der Beschreibung werden stark beschädigte Flügel erwähnt. Das von Aubert (1981: 307) in München als Holotypus bezeichnete Exemplar trägt das Etikett "Moravia Slavicek" (=Mähren/CZ), und seine Flügel sind vollständig. Es besitzt keinen Typenstatus, stimmt aber sehr gut mit der Beschreibung überein.

Ichneumon gymnogonus **Kriechbaumer, 1894**e: 348 f.
Holotypus (♂) höchstwahrscheinlich mit der Sammlung Tischbein/Hamburg zerstört.
Taxon uninterpretiert.

Ichneumon haemorrhoicus **Kriechbaumer, 1887**c: 302 f.
Holotypus (♀) in Bern (Aubert 1981: 307, Hilpert 1992b: 185).
Gültiger Name: *Ichneumon haemorrhoicus haemorrhoicus* Kriechbaumer (Yu & Horstmann 1997: 602).

Ichneumon hercynicus **Kriechbaumer, 1890**c: 292 f.
Holotypus (♂) in København.
Gültiger Name: *Ichneumon curtulus* Kriechbaumer (Hilpert 1992b: 228).

Ichneumon hexaleucus **Kriechbaumer*, 1899**: 67 f.
Holotypus in München (Aubert 1981: 308).
Gültiger Name: *Virgichneumon monostagon* (Gravenhorst) (syn. nov.). Es handelt sich um die von Schmiedeknecht (1929: 354) erwähnte Varietät mit ungeflecktem sechsten Gastertergit.

Ichneumon illustris **Kriechbaumer*, 1894**b: 49
Holotypus (♂): "Poprádi ló VIII hó l: Mocsáry S." (=Poprad/SK), "*Ichneumon illustris* Kriechb. (typ.)", Budapest.
Gültiger Name: *Diphyus gradatorius* (Thunberg) (Hilpert det.) (syn. nov.). Es handelt sich um eine Varietät, bei der die Gasterspitze gelbrot gefärbt ist.

Ichneumon imitator **Kriechbaumer*, 1882**a: 239 f. (praeocc. durch *I. imitator* Villers, 1789).
Lectotypus (♀) in München.
Gültiger Name: *Barichneumon bilunulatus* (Gravenhorst) (Aubert 1981: 308). In München befindet sich Sammlungsmaterial, das von Heinrich und Hinz irrtümlich als *B. imitator* (Kriechbaumer) determiniert worden ist, das aber zu *B. lituratae* (Hartig) gehört. Auf letztere Art beziehen sich wahrscheinlich auch die unter dem Namen *B. imitator* von Rasnitsyn & Siitan (1981: 585) und Sawoniewicz (1999: 27) publizierten Notizen. *B. lituratae* unterscheidet sich von *B. bilunulatus* durch folgende Merkmale: Körperlänge 7-8 mm; beim ♀ Hinterfemora auf der Außenseite überwiegend dicht punktiert, Vorder- und Mittelfemora schwarz und rotbraun gemustert, Hinterfemora rotbraun, Vorder- und Mitteltibien hell rotbraun, Hintertibien rotbraun, apical bräunlich; beim ♂ proximales Tyloid auf dem dritten oder vierten Geißelglied, Hinterfemora und Hintertibien häufig rotbraun und schwarz gemustert.

Ichneumon inversus **Kriechbaumer, 1893**b: 363 f. (praeocc. durch *I. inversus* Geoffroy, 1785)
Holotypus (♀) in München (Aubert 1981: 308).
Gültiger Name: *Barichneumon gemellus* (Gravenhorst) (Hilpert 1992a: 143). Kriechbaumer gibt in seiner Beschreibung nicht klar an, ob ein zusätzlich erwähntes ♂ als Syntypus betrachtet werden muß. Aubert bezeichnet das ♀ als Holotypus.

Ichneumon Jemilleri **Kriechbaumer*, 1893**b: 263 f.
Holotypus (♂) in München (Aubert 1981: 308).
Gültiger Name: *Aoplus defraudator* (Wesmael) (Hinz & Horstmann 2000: 31).

Ichneumon lanceolatus **Kriechbaumer*, 1893**b: 259 ff. (praeocc. durch *I. lanceolatus* Walker, 1874)
Holotypus (♀): "M. Isar. 24.6.74. Krchb." (= München-Isar), "74./48.", "*Ichneumon lanceolatus* m. ♀. E.N. 1893. p.", München.
Gültiger Name: *Cratichneumon lancea* (Dalla Torre) (comb. nov.).

Ichneumon lateralis **Kriechbaumer, 1887**c: 305 f. (praeocc. durch *I. lateralis* Cuvier, 1833)
Holotypus (♂) in Bern unauffindbar.
Taxon uninterpretiert. Unter diesem Namen befinden sich 1♂ in Bern (Nichttypus aus dem Valais/CH) und 2♂♂ in Frankfurt. Diese ♂♂ stimmen nicht ganz mit der Beschreibung überein (bei keinem sind die Schulterbeulen gelb und die Subalarwülste schwarz),

außerdem sind sie nach Hilpert (1992b) nicht sicher zu determinieren.

Ichneumon lativentris **Kriechbaumer, 1894**b: 51
Holotypus (♂) in Budapest.
Gültiger Name: *Ichneumon ? affector* Tischbein (Hilpert 1992b: 272).

Ichneumon leptostigma **Kriechbaumer, 1888**e: 27 f.
Holotypus (♂) in Wien.
Gültiger Name: *Ichneumon leptostigma* Kriechbaumer (Aubert 1981: 308, Hilpert 1992b: 290).

Ichneumon leucurus **Kriechbaumer*, 1894**b: 53 f.
Holotypus (♂) von Hilpert beschriftet: "Farkasv. … 5/6" (= Farkasvölgy/Budapest), "*Ichneumon leucurus* Kriechb.", "*Ichneumon leucurus* Kriechb. (typ.)", Budapest.
Gültiger Name: *Barichneumon leucurus* (Kriechbaumer) (comb. nov.). Die Art steht anscheinend in der Nähe von *B. albicaudatus* (Boyer de Fonscolombe). Sie weicht von dieser Art ab durch: Clypeus bis zum Apicalrand dicht und kräftig punktiert, Hinterfemora basal und dorsal rot, Hintertibien überwiegend rot, nur apical schwarz, Genitalklappen weiß.

Ichneumon levis **Kriechbaumer, 1888**e: 28 f. (praeocc. durch *I. laevis* Ratzeburg, 1844)
Lectotypus (♂) in Wien (Hilpert 1992b: 122).
Gültiger Name: *Ichneumon berninae* (Habermehl) (Yu & Horstmann 1997: 591). Aubert (1981: 308 f.) hat den Lectotypus fälschlich als Holotypus bezeichnet.

Ichneumon lunuliger **Kriechbaumer*, 1890**c: 293 f.
Holotypus (♂): "Mels. [?] 10.6.81." (nach der Beschreibung von Alsen/DK), "♂", "Type der Beschreibung Kriechbaumers", "*lunuliger* Krchb.", "Coll. Wüstnei.", København.
Gültiger Name: *Barichneumon praeceptor* (Thunberg) (syn. nov.).

Ichneumon Manni **Kriechbaumer, 1888**e: 30 f.
Holotypus (♀) in Wien.
Gültiger Name: *Barichneumon manni* (Kriechbaumer) (Aubert 1981: 309).

Ichneumon Medeae **Kriechbaumer, 1895**b: 109 f.
Holotypus (♂) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört.
Taxon uninterpretiert.

Ichneumon melanostigma **Kriechbaumer*, 1882**e: 144 (praeocc. durch *I. melanostygma* Cuvier)
Holotypus (♂): "Buda" (=Budapest), "*Ichneumon melanostigmus* det. Kriechb.", "*Ichneumon melanostigma* Kriechb. (typ.)", Budapest.
Gültiger Name: *Ichneumon phaeostigmus* Wesmael (Hilpert 1992b: 251). Das von Aubert (1968a: 192) als Holotypus bezeichnete und von Hilpert als solcher anerkannte Exemplar in München ist kein Syntypus, denn es stammt von Mehadia in Rumänien, während als Typenfundort "Hungaria centrali ad Budapestinum" genannt wird. Beide Exemplare gehören zu derselben Art.

Ichneumon melanothorax **Kriechbaumer*, 1886**: 241 f.
Holotypus (♀) von Perkins beschriftet: "Altvater" (=Praděd-Gebirge/CZ), "*Ichneumon melanothorax* Krchb. Altvater", München (große Teile der Hinterbeine und der Gaster fehlen).
Gültiger Name: *Ichneumon obliteratus* Wesmael (Hilpert 1992b: 134). Kriechbaumer hat die Art eindeutig nach 1♀ vom Berg Altvater beschrieben, aber es befinden sich in München 2♀♀ und in København 1♀ von diesem Fundort, und sie sind alle als Typen etikettiert: das zweite ♀ in München von Aubert (1981: 309) und das ♀ in København von Oehlke (unpubliziert). Hilpert hat den von Aubert festgelegten "Lectotypus" in München als Typus akzeptiert. Es stimmt aber nur der von Perkins beschriftete Typus mit der Beschreibung überein (diese: "Vorderbeine … roth, … nur die Oberseite der Hüften und die Schenkelringe … schwarz"). Bei dem zweiten ♀ in München sind die Vorderhüften ganz schwarz, bei dem ♀ in København sind sie überwiegend schwarz und nur außen rötlich gefleckt. Meines Erachtens gehören die 3♀♀ zu derselben Art.

Ichneumon mesopyrrhus **Kriechbaumer*, 1893**b: 261 ff.
Holotypus (♂) in München (Aubert 1981: 309).
Gültiger Name: *Aoplus castaneus* (Gravenhorst) (Hinz & Horstmann 2000: 31).

Ichneumon Moraguesi **Kriechbaumer*, 1894**a: 240
Lectotypus (♀) in Madrid.
Gültiger Name: *Barichneumon bilunulatus* (Gravenhorst) (Horstmann & Bordera 1995: 50).

Ichneumon mordax **Kriechbaumer, 1875**: 154 f.
Lectotypus (♀) in München.
Gültiger Name: *Ichneumon mordax* Kriechbaumer (Hilpert 1992b: 191). Aubert (1981: 309) hat den Lectotypus fälschlich als Holotypus bezeichnet.

Ichneumon Munki **Kriechbaumer, 1893**b: 365 f.
Holotypus (♂) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört.
Gültiger Name: *Exephanes occupator* (Gravenhorst) (syn. nov.). Die Beschreibung bezieht sich auf das-

selbe Typusexemplar wie die von *I.* (*Exephanes* ?) *munki* Kriechbaumer, 1895, was bisher übersehen worden ist (siehe unten). Beide Taxa sind deshalb nicht nur Homonyme, sondern auch primäre Synonyme.

***Ichneumon* (*Exephanes* ?) *Munki* Kriechbaumer, 1895**b: 107 (praeocc. durch *I. munki* Kriechbaumer, 1893)
Holotypus (♂) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört.
Gültiger Name: *Exephanes occupator* (Gravenhorst) (Hinz & Horstmann 2000: 19). Bisher ist übersehen worden, daß Kriechbaumer unter dem Namen *I. Munki* nach demselben Typusexemplar zwei voneinander verschiedene Taxa beschrieben hat. Er bezeichnet ausdrücklich auch das zweite Taxon als neu, und beide Beschreibungen sind voneinander unabhängig. Verwirrend ist, daß der Holotypus nach der ersten Beschreibung "aus einer Schmetterlingspuppe gezogen", nach der zweiten aber "gefangen" wurde.

***Ichneumon mustela* Kriechbaumer, 1895**b: 108 f.
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört.
Taxon uninterpretiert. Berthoumieu (1904: 33) stellt die Art nach der Beschreibung zu *Stenichneumon* Thomson.

***Ichneumon nigritarsis* Kriechbaumer, 1889**b: 201 f.
Holotypus (♀) in München.
Gültiger Name: *Coelichneumon mayri* (Tischbein) (Kriechbaumer 1894e: 249, Aubert 1981: 309). Der von Kriechbaumer angegebene Grund, weshalb sein Name *I. nigritarsis* beizubehalten sei, entspricht nicht den Nomenklaturregeln.

***Ichneumon novemalbatus (9-albatus)* Kriechbaumer, 1875**: 152
Lectotypus (♀) in München.
Gültiger Name: *Ichneumon novemalbatus novemalbatus* Kriechbaumer (Hilpert 1992b: 135). Aubert (1981: 309) hat den Lectotypus fälschlich als Holotypus bezeichnet.

***Ichneumon Ophiusae* Kriechbaumer*, 1890**a: 479 f.
Holotypus (♂): "Type", "E *Toxocampa lusoria*", "*Ophiusa lusoria* 21/6." (nach der Beschreibung aus der Umgebung von Wien), "*Ichneum. ophiusae* Krchb. 1890.", Wien.
Gültiger Name: *Coelichneumon ophiusae* (Kriechbaumer) (Aubert 1981: 310).

***Ichneumon oviventris* Kriechbaumer, 1890**c: 291 f.
Holotypus (♀) in København.
Gültiger Name: *Ichneumon submarginatus* Gravenhorst (Hinz 1975: 67, Rasnitsyn 1981: 110, Hilpert 1992b: 121).

***Ichneumon parvulus* Kriechbaumer*, 1887**c: 306 f. (praeocc. durch *I. parvulus* Gravenhorst, 1829)
Holotypus (♀): "29.VII. Sedrun" (in Graubünden/CH), Bern.
Gültiger Name: *Cratichneumon parvulus* (Kriechbaumer). Heinrich (1937: 52) synonymisiert die Art mit *C. punctifrons* (Holmgren) (recte: *C. jocularis* (Wesmael)), aber meines Erachtens handelt es sich um eine eigene Art, die wegen der ungeklärten taxonomischen Probleme nicht neu benannt wird. *C. parvulus* unterscheidet sich von 1♀ in München, das von Heinrich als *C. punctifrons* determiniert worden ist, durch folgende Merkmale: Stirn dorsal fein und mäßig dicht punktiert auf glänzendem, stellenweise glattem Grund; Mesoscutum auf dem Mittellappen zerstreut, auf den Seitenlappen sehr zerstreut punktiert auf glattem Grund; Scutellum fast ganz glatt, mit wenigen Punkten; Area superomedia deutlich länger als breit, caudal offen; Thyridien fast verloschen, deutlich schmäler als der Raum zwischen ihnen; zweites Gastertergit überwiegend fein und zerstreut punktiert auf gekörneltem Grund, mit feinen Querrunzeln und Quer-Körnelreihen; Collum und Scutellum schwarz.

***Ichneumon pentaleucus* Kriechbaumer, 1895**b: 108
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Munk/Augsburg zerstört (Aubert 1981: 310).
Gültiger Name: *Ichneumon coniger* Tischbein (Hilpert 1992b: 162).

***Ichneumon pertubans* Kriechbaumer*, 1900**a: 169 ff.
Holotypus (♂) in Berlin.
Gültiger Name: *Anisopygus pseudonymus* (Wesmael) (Heinrich 1937: 58). Heinrich (1980b: 178) hat seine frühere Interpretation der Art übersehen und diese als eigene Art zu *Gareila* Heinrich gestellt. Der Irrtum ist auf einen Sexualdimorphismus bei *A. pseudonymus* zurückzuführen: Beim ♀ ist der Postpetiolus fein strukturiert und glänzend, beim ♂ deutlich gerunzelt. Dieser Unterschied wird von Heinrich (1961: 376, 1980b: 177 f.) als Unterschied zwischen den Gattungen *Anisopygus* Kriechbaumer und *Gareila* Heinrich genannt. Beide Gattungen stehen zueinander in einem ähnlichen Verhältnis wie *Diphyus* Kriechbaumer und *Ichneumon* Linnaeus: Bei den ♀♀ von *Anisopygus* ist die Subgenitalplatte groß, und der Bohrer steht nicht über die Gasterspitze vor (amblypyg), bei den ♂♂ ist die Längsfalte des vierten Gastersternits in der Regel undeutlich oder fehlend, und die Art belegt anscheinend die Raupen des Wirts *Clostera* sp. (Notodontidae) (Grönblom 1964: 106). Bei den

♀♀ von *Gareila* ist die Subgenitalplatte kurz, und der Bohrer überragt die Gasterspitze (oxypyg), bei den ♂♂ ist die Längsfalte des vierten Gastersternits in der Regel deutlich, und *G. patruelis* (Holmgren) belegt die Puppen des Wirts *Habrosyne pyritoides* (Hufnagel) (Drepanidae) (Hinz 1991: 113).

Ichneumon perversus **Kriechbaumer, 1893**b: 364
Holotypus (♀) in München.
Gültiger Name: *Barichneumon perversus* (Kriechbaumer) (Aubert 1981: 310).

Ichneumon polystictus **Kriechbaumer, 1887**c: 307
Holotypus (♂) in Bern.
Gültiger Name: *Baranisobas ridibundus* (Gravenhorst) (Aubert 1966b: 106, 1981: 310).

Ichneumon puerulus **Kriechbaumer, 1890**b: 182 f.
Holotypus (♀) in München (Aubert 1981: 310).
Gültiger Name: *Syspasis eburnifrons* (Wesmael) (Rasnitsyn & Siitan 1981: 590).

Ichneumon pulvinatus **Kriechbaumer, 1874**: 148 ff.
Holotypus (♀) in München.
Gültiger Name: *Ichneumon pulvinatus* Kriechbaumer (Aubert 1981: 310, Hilpert 1992b: 118).

Ichneumon quinquealbatus (5 albatus) **Kriechbaumer, 1890**e: 235 f.
Holotypus (♂) in København.
Gültiger Name: *Ichneumon quinquealbatus* Kriechbaumer (Aubert 1981: 311, Hilpert 1992b: 320).

Ichneumon repetitor **Kriechbaumer, 1882**a: 237 ff.
Lectotypus (♀) in München (Aubert 1981: 311).
Gültiger Name: *Ichneumon sarcitorius repetitor* Kriechbaumer (Hilpert 1992b: 90).

Ichneumon Rogenhoferi **Kriechbaumer, 1888**e: 24 ff.
Lectotypus (♀) in Wien.
Gültiger Name: *Ichneumon vafer vafer* Tischbein (Hilpert 1992b: 138).

Ichneumon rufigena **Kriechbaumer, 1875**: 155 f.
Holotypus (♀) in München.
Gültiger Name: *Ichneumon rufigena* Kriechbaumer (Aubert 1981: 311, Hilpert 1992b: 199).

Ichneumon Seisensis **Kriechbaumer, 1893**b: 330 f.
Holotypus (♂) in München.
Gültiger Name: *Ichneumon seisensis* Kriechbaumer (Aubert 1981: 311, Hilpert 1992b: 321).

Ichneumon semiannulatus **Kriechbaumer*, 1895**b: 111
Holotypus (♂) in München (Aubert 1981: 311).
Gültiger Name: *Cratichneumon jocularis* (Wesmael) (Horstmann 2002: 86).

Ichneumon sexarmillatus (6-armillatus) **Kriechbaumer*, 1891**a: 8 ff.
Holotypus (♀) in München (Aubert 1981: 311).
Gültiger Name: *Cratichneumon sexarmillatus* (Kriechbaumer) (comb. nov.), syn. *Ichneumon albiscuta* Thomson (syn. nov.). Der Holotypus von *C. sexarmillatus* unterscheidet sich von anderen ♀♀ der Art durch die ausgedehntere Punktierung des Postpetiolus.

Ichneumon sexguttatus (6-guttatus) **Kriechbaumer*, 1894**b: 52 f.
Holotypus (♂): "Budap. Kohaut" (= Budapest), "*Ichneumon sexguttatus* Kriechb.", "*Ichneumon sexguttatus* Kriechb. (typ)", Budapest.
Gültiger Name: *Melanichneumon designatorius* (Linnaeus) (syn. nov.). Der Holotypus stimmt mit dem Belegexemplar der von Kriechbaumer (1898a: 311 f.) beschriebenen *I. fortipes* Wesmael var. *rufipes* (Name infrasubspezifisch) in München überein.

Ichneumon Siculus **Kriechbaumer*, 1887**c: 304 f.
Lectotypus (♀) von Hilpert beschriftet und hiermit festgelegt: "Siracusa 11.V.77", Bern.
Gültiger Name: *Bureschias subcylindricus* (Gravenhorst) (Hilpert det.) (syn. nov.). Als Paralectotypen sind in Bern 3♂♂ vorhanden.

Ichneumon Sieboldi **Kriechbaumer, 1893**b: 329 f.
Syntypen (2♂♂) in München unauffindbar.
Taxon uninterpretiert.

Ichneumon signaticornis **Kriechbaumer, 1893**b: 331 f.
Lectotypus (♂) in München.
Gültiger Name: *Ichneumon signaticornis* Kriechbaumer (Hilpert 1992b: 190).

Ichneumon spilomerus **Kriechbaumer, 1888**e: 29 f.
Holotypus (♂) in Wien.
Gültiger Name: *Cratichneumon spilomerus* (Kriechbaumer) (Aubert 1981: 311).

Ichneumon Steckii **Kriechbaumer, 1887**c: 303
Holotypus (♀) in Bern (Aubert 1981: 311).
Gültiger Name: *Ichneumon affector affector* Tischbein (Hilpert 1992b: 272).

Ichneumon sulphuratus **Kriechbaumer, 1894**b: 50 f.
Holotypus (♂) in Budapest.
Gültiger Name: *Ichneumon crassifemur* Thomson (Hilpert 1992b: 175).

Ichneumon Tischbeini **Kriechbaumer, 1894**e: 342
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Tischbein/Hamburg zerstört.
Taxon uninterpretiert.

Ichneumon Tosquineti **Kriechbaumer*, 1896**a: 358 f.
Lectotypus (♀) hiermit festgelegt: "type", "Belgique Groenendaele 14. 7/91." (= Groenendaal bei Bruxelles), "Collection Dr. J. Tosquinet", "*Ichneumon Tosquineti* Kriech. dét. J. Tosquinet", Bruxelles.
Gültiger Name: *Gareila nivata* (Gravenhorst) (syn. nov.). Ein weiterer Syntypus (♀) ist höchstwahrscheinlich mit der Sammlung Athimus zerstört. Der Lectotypus war verschollen (Horstmann 2002: 80 f.). C. Thirion hat ihn vor kurzem gefunden und mir zur Untersuchung geschickt. Es handelt sich um eine Varietät von *G. nivata* mit ungeflecktem Postpetiolus.

Ichneumon trialbatus **Kriechbaumer, 1880**c: 13 f.
Lectotypus (♂) in München.
Gültiger Name: *Ichneumon trialbatus* Kriechbaumer (Hilpert 1992b: 322).

Ichneumon vulpecula **Kriechbaumer, 1875**: 156 f.
Holotypus (♀) in München.
Gültiger Name: *Cratichneumon vulpecula* (Kriechbaumer) (Aubert 1981: 311).

Ichneumon wuestneii (Wüstneii) **Kriechbaumer, 1890**c: 290 f.
Holotypus (♀) in København.
Gültiger Name: *Ichneumon gracilentus* Kriechbaumer (Hilpert 1992b: 245). Die inkorrekte ursprüngliche Schreibweise "*Wüstneii*" ist zu "*wuestneii*" zu korrigieren (nach Artikel 32.5.2.1 der Nomenklaturregeln), weil der Wohnort des Sammlers Wüstnei um 1890 zu Deutschland gehörte.

Ischnocerus **(!)** ***filicornis*** **Kriechbaumer*, 1879**a: 164 f.
Lectotypus (♀) hiermit festgelegt: "M. Hess. 10.6.65. A. Krchb." (= München-Hesselohe), München.
Gültiger Name: *Ischnoceros rusticus* (Geoffroy) (Pfankuch 1924: 50). Als Paralectotypus ist in München 1♀ vorhanden.

Ischnocerus **(!)** ***seticornis*** **Kriechbaumer*, 1879**a: 165 f.
Lectotypus (♀) hiermit festgelegt: "Rsh. Hst. 9.8.64. A. Krchb." (= Hochstätt bei Rosenheim/D), München.
Gültiger Name: *Ischnoceros caligatus* (Gravenhorst) (Clément 1938: 509). Als Paralectotypen sind in München 3♀♀ und 1♂ vorhanden.

Ischnogaster albibucca **Kriechbaumer*, 1890**b: 154 f.
Lectotypus (♀) von Diller beschriftet und von Aubert (1974: 264) festgelegt: "M. Hess. 15.6.87. Krchb." (= München-Hesselohe), "87./351.", München.
Gültiger Name: *Notosemus bohemani* (Wesmael) (Perkins 1953: 133). Aubert bezeichnet den Lectotypus als "le type"; dies wird als gültige Festlegung eines Lectotypus interpretiert (siehe Einleitung). Ein Paralectotypus (♂) ist in München vorhanden, weitere Syntypen (2♂♂) sind unauffindbar.

Ischnus **(?)** ***balearicus*** **Kriechbaumer*, 1894**a: 242
Lectotypus (♂) in Madrid.
Gültiger Name: *Heterischnus ridibundus* (Costa) (Horstmann & Bordera 1995: 51).

Ischnus pictipes **Kriechbaumer*, 1894**a: 242
Lectotypus (♀) in Madrid.
Gültiger Name: *Heterischnus proximus* (Costa) (Horstmann & Bordera 1995: 51).

Leptocryptus albomarginatus **Kriechbaumer*, 1892**f: 371 f.
Lectotypus (♀) in München (Aubert 1968a: 193, 1974: 270, Sawoniewicz 1980: 337).
Gültiger Name: *Bathythrix formosa* (Desvignes) (Horstmann 1998c: 435).

Leptocryptus bellulus **Kriechbaumer*, 1892**f: 372 f.
Holotypus (♀) in München (Aubert, 1968a: 193, 1974: 270, Sawoniewicz 1980: 337 f.).
Gültiger Name: *Bathythrix fragilis* (Gravenhorst) (Horstmann 1998c: 435).

Leptocryptus rubens **Kriechbaumer, 1892**f: 373
Holotypus (♀) in München.
Gültiger Name: *Bathythrix tenuis* (Gravenhorst) (Aubert 1974: 270, Sawoniewicz 1980: 359). Kriechbaumer gibt in seiner Beschreibung nicht klar an, ob ein zweites erwähntes ♀ als Syntypus betrachtet werden muß. Während Aubert diese Frage offen läßt, bezeichnet Sawoniewicz das in München vorhandene ♀ als Holotypus.

Limneria (Anilasta) nigritarsis **Kriechbaumer in Schletterer, 1894**: 20
Holotypus (♀) in München und Wien unauffindbar (Aubert 1974: 272).
Taxon uninterpretiert.

Liogaster longulus **Kriechbaumer, 1890**c: 297
Holotypus (♀) in København.
Gültiger Name: *Liotryphon punctulatus* (Ratzeburg) (Oehlke 1966b: 145).

Lissonota albicoxis **Kriechbaumer*, 1888**e: 35
Holotypus (♀): "Roghf. 1886 N. Oest.", "e *Eupithecia acteata* [!] S. Egyd ..." (= St. Aegyd/Niederösterreich), "*Lissonota albicoxis* Krchb. ♀. det. Kriechbaumer", "*albicoxis* Krchb. ♀.", Wien.
Gültiger Name: *Lissonota albicoxis* Kriechbaumer. Die Angabe von Aubert (1978: 81), daß der Holotypus in München aufbewahrt werde, ist irrig. Die Art kommt auch in Deutschland vor: 1♀ von Hindelang/Bayern, Coll. Hinz/München.

Lissonota iridipennis **Kriechbaumer, 1900**a: 171 f.
Holotypus (♀) in Berlin unauffindbar.
Gültiger Name: *Lissonota buccator* (Thunberg) (syn. nov.). Aubert (1978: 85) vermutet, daß beide Taxa synonym sein könnten. Da die Beschreibung von *L. iridipennis* hinreichend gut mit einigen ♀♀ von *L. buccator* übereinstimmt, wird diese Vermutung hier akzeptiert.

Lissonota monosticta **Kriechbaumer, 1900**a: 171
Holotypus (♀) in Berlin unauffindbar.
Taxon uninterpretiert (Aubert 1978: 165).

Lissonota multipicta **Kriechbaumer*, 1895**c: 264 ff. (praeocc. in *Syzeuctus* Förster durch *Macrus multipictus* Saussure, 1892)
Lectotypus (♂) durch Aubert (1978: 130) festgelegt: "Sièrre 21-23.6.79. Frey-G." (=Sierre/Valais/CH), "830", "*multipicta* m. ♂.", München.
Gültiger Name: *Syzeuctus luniger* (Brauns) (syn. nov.). Brauns (1901: 181 f.) und die nachfolgenden Autoren haben *Lissonota lunigera* Brauns und *L. multipicta* Kriechbaumer als Varietäten oder mögliche Synonyme zu *S. maculipennis* (Costa) gestellt. Der Lectotypus von *L. lunigera* ist verschollen (Horstmann 1998a: 83), aber ein Paralectotypus (♂) ist in Berlin vorhanden und wurde verglichen. Außerdem wurden beide Taxa in Sierre/Valais gefangen. *S. maculipennis* (Costa) ist unrevidiert, und die Interpretation dieser Art ist ungeklärt. Aubert bezeichnet den Lectotypus von *L. multipicta* als "le type"; dies wird als gültige Festlegung eines Lectotypus angesehen (siehe Einleitung). Das Fangdatum dieses Exemplars weicht etwas von der Beschreibung ab (diese: 22. und 25.7.). Dies wird als Schreibfehler Kriechbaumers interpretiert, weil die Beschreibung Angaben über die Zeichnung des Gesichts und des Mesoscutums enthält, die mit dem Lectotypus übereinstimmen. Paralectotypen der Art befinden sich in Bern (2♂♂) und München (3♂♂); das von Kriechbaumer beschriebene fragliche ♀ ist unauffindbar.

Lissonota puberula **Kriechbaumer, 1895**c: 263 f.
Holotypus (♂) in Bern.
Gültiger Name: *Syzeuctus puberulus* (Kriechbaumer) (Aubert 1969b: 87). Aubert hat den Holotypus fälschlich als Lectotypus bezeichnet.

Meniscus scapularis **Kriechbaumer*, 1890**a: 483
Holotypus (♀): "Mann 1859 Mehadia" (in Rumänien), "*Meniscus scapularis* Kr. ♀ Kriechbaumer det.", "*Meniscus scapularis* Krchb. ♀.", Wien.
Gültiger Name: *Lissonota rufipes* Brischke (Yu & Horstmann 1997: 73).

Mesochorus anthracinus **Kriechbaumer, 1890**a: 484 f.
Holotypus (♀) in Wien.
Gültiger Name: *Mesochorus anthracinus* Kriechbaumer (Schwenke 1999: 61).

Mesochorus gigas **Kriechbaumer*, 1897**c: 332 f.
Holotypus (♀) in München (Schwenke 1999: 12).
Gültiger Name: *Cidaphus areolatus* (Boie) (Horstmann 2002: 81).

Mesoleius polyblastoides **Kriechbaumer*, 1897**a: 170 ff.
Lectotypus (♀) in München.
Gültiger Name: *Syndipnus polyblastoides* (Kriechbaumer) (Kasparyan 1998: 181, Horstmann 2001b: 80).

Mesoleius rufogibbosus **Kriechbaumer*, 1897**a: 169 f.
Holotypus (♂) in München.
Gültiger Name: *Otlophorus rufogibbosus* (Kriechbaumer) (Kasparyan 1998: 181, Horstmann 2001b: 80).

Mesoleius trochanteratus **Kriechbaumer*, 1896**b: 132 f. (praeocc. durch *M. trochanteratus* Brischke, 1871)
Lectotypus (♀) in München (Kasparyan 1997: 302, Horstmann 2000a: 69).
Gültiger Name: *Campodorus nematicida* Horstmann (Horstmann 2001a: 99).

Mesoleptus (Zemiodes) erythropus **(Förster in litt.) Kriechbaumer*, 1891**b: 140
Lectotypus (♀) in München.
Gültiger Name: *Hadrodactylus semirufus* (Holmgren) (Horstmann 2000b: 45).

Mesoleptus melanobasis **Kriechbaumer, 1896**a: 361 f.
Holotypus (♂) in Bruxelles unauffindbar.
Taxon uninterpretiert (Horstmann 2002: 81).

Mesolius (!) periscelius **Kriechbaumer, 1890**c: 294 ff.
Syntypen in København (1♀) und München (1♂) unauffindbar.
Gültiger Name: *Lamachus transiens* (Ratzeburg) (Oehlke 1966a: 859).

Mesostenus albovinctus **Kriechbaumer*, 1901**: 254 f.
Lectotypus (♀) in München.
Gültiger Name: *Goryphus leucopygus* (Walker) (Horstmann 1990: 68).

Metopius erythropygus **Kriechbaumer, 1894**b: 58 f.
Holotypus (♀) in Budapest.
Gültiger Name: *Metopius erythropygus* Kriechbaumer (Clément 1930: 425, Móczár 1968a: 184).

Microcryptus acuminatus **Kriechbaumer, 1899**: 296 f.
Holotypus (♀) höchstwahrscheinlich mit der Sammlung Athimus zerstört (Aubert 1974: 266).
Taxon uninterpretiert.

Microcryptus alpinus **Kriechbaumer, 1893**a: 145 f.
Holotypus (♀) in München.
Gültiger Name: *Plectocryptus alpinus* (Kriechbaumer) (Aubert 1974: 266, Sawoniewicz 1984: 320, Schwarz 2003: 1103).

Microcryptus amoenus **Kriechbaumer, 1892**f: 362 f.
Holotypus (♂) in München (Aubert 1968a: 192).
Gültiger Name: *Aptesis leucotarsus* (Gravenhorst) (Sawoniewicz 1989: 219).

Microcryptus armatus **Kriechbaumer, 1893**a: 123 f.
Lectotypus (♀) in München (Aubert 1974: 266, Sawoniewicz 1984: 320 f.).
Gültiger Name: *Plectocryptus effeminatus* (Gravenhorst) (Sawoniewicz 1989: 217).

Microcryptus clavatus **Kriechbaumer, 1893**a: 57 f.
Holotypus (♂) in München (Aubert 1974: 266).
Gültiger Name: *Plectocryptus effeminatus* (Gravenhorst) (Sawoniewicz 1989: 217).

Microcryptus contrarius **Kriechbaumer*, 1893**a: 147 f.
Holotypus (♀) in München (Aubert 1974: 266).
Gültiger Name: *Cubocephalus leucopygus* (Kriechbaumer) (Sawoniewicz 2003: 214).

Microcryptus contrarius **Kriechbaumer*, 1894**a: 244 (praeocc. durch *M. contrarius* Kriechbaumer, 1893)
Lectotypus (♂) in Madrid.
Gültiger Name: *Aptesis opposita* (Kriechbaumer) (Horstmann & Bordera 1995: 51).

Microcryptus crassicornis **Kriechbaumer, 1891**c: 163 ff.
Lectotypus (♀) in München.
Gültiger Name: *Schenkia crassicornis* (Kriechbaumer) (Aubert 1974: 266, Sawoniewicz 1984: 321).

Microcryptus cruentus **Kriechbaumer, 1891**c: 167 f.
Holotypus (♂) in München.
Gültiger Name: *Pleolophus sperator* (Müller) (Aubert 1974: 267).

Microcryptus curtulus **Kriechbaumer, 1891**c: 171
Lectotypus (♂) in München (Aubert 1974: 267).
Gültiger Name: *Pleolophus brachypterus* (Gravenhorst) (Sawoniewicz 1988: 485).

Microcryptus curtulus **Kriechbaumer var.** *polysticta* **Kriechbaumer*, 1891**c: 171 f.
Holotypus (♂) in München.
Gültiger Name: *Pleolophus larvatus* (Gravenhorst) (Sawoniewicz 1988: 484).

Microcryptus genalis **Kriechbaumer in Schletterer, 1895**: 38 (praeocc. in *Microcryptus* Thomson durch *Cryptus genalis* Brischke, 1891).
Syntypen (2♂♂) in München und Wien unauffindbar (Aubert 1974: 267).
Gültiger Name: *Aptesis jejunator* (Gravenhorst) (Sawoniewicz 1993: 15).

Microcryptus gracilicornis **Kriechbaumer, 1891**c: 166 f.
Holotypus (♀) in München.
Gültiger Name: *Javra opaca* (Thomson) (Aubert 1974: 267).

Microcryptus Jemilleri **Kriechbaumer, 1893**a: 58 ff.
Lectotypus (♀) in München.
Gültiger Name: *Javra jemilleri* (Kriechbaumer) (Aubert 1974: 267, Sawoniewicz 1986: 373).

Microcryptus leucopygus **Kriechbaumer*, 1891**c: 169
Holotypus (♂) in München (Aubert 1961: 208, 1962: 132, 1968a: 192).
Gültiger Name: *Cubocephalus leucopygus* (Kriechbaumer) (Sawoniewicz 2003: 214).

Microcryptus oppositus **Kriechbaumer in Dalla Torre, 1902**: 708, nom. nov. für *M. contrarius* Kriechbaumer, 1894 (praeocc. durch *M. contrarius* Kriechbaumer, 1893).
Lectotypus (♂) in Madrid.
Gültiger Name: *Aptesis opposita* (Kriechbaumer) (Horstmann & Bordera 1995: 51).

Microcryptus perversus **Kriechbaumer, 1893**a: 125 f.
Holotypus (♂) in Genova unauffindbar (Aubert 1974: 267).
Gültiger Name: *Aptesis perversa* (Kriechbaumer) (Aubert 1963: 865). Habermehl (1919: 292) erwähnt 1♂ dieser Art aus der Umgebung von Worms/D,

das von Kriechbaumer mit der Type von *M. perversus* verglichen worden sei. Dieses ist in Frankfurt vorhanden (Fundortetikett: "Bürst. W. 3.7.95 Hbm.") und wird hier zur Interpretation der Art herangezogen, da es mit der Beschreibung hinreichend gut übereinstimmt. Die von Aubert (1971: 215) und Villemant (1982: 266) unter dem Namen *Pleolophus perversus* (Kriechbaumer) angeführten ♂♂ weichen von der Beschreibung durch die weiß gefleckten Mandibeln und die deutlich weiß gefleckten hinteren Gastertergite ab.

Microcryptus planus **Kriechbaumer, 1893**a: 150 f.
Holotypus (♀) in München unauffindbar.
Taxon uninterpretiert (Aubert 1968a: 194, 1974: 267 f., Horstmann 1992: 243).

Microcryptus poecilops **Kriechbaumer, 1891**c: 169 f.
Holotypus (♂) in München (Aubert 1974: 268).
Gültiger Name: *Plectocryptus poecilops* (Kriechbaumer) (Sawoniewicz 1989: 217).

Microcryptus punctulatus **Kriechbaumer, 1891**c: 165 f.
Holotypus (♀) in München (Townes et al. 1965: 449).
Gültiger Name: *Crypteffigies pseudocryptus* (Wesmael) (Aubert 1974: 268).

Microcryptus rhombifer **Kriechbaumer, 1893**a: 148 ff.
Holotypus (♀) in München.
Gültiger Name: *Oresbius arridens* (Gravenhorst) (Aubert 1974: 268).

Microcryptus senex **Kriechbaumer, 1893**a: 55 f.
Lectotypus (♀) in München.
Gültiger Name: *Polytribax senex* (Kriechbaumer) (Aubert 1974: 268).

Microcryptus seniculus **Kriechbaumer*, 1893**a: 56 f.
Lectotypus (♂) von Sawoniewicz beschriftet und hiermit festgelegt: "M. Isar 12.6.70. Krchb." (= München-Isar), "70.1/78.", "*Microcr. seniculus* m. ♂", München.
Gültiger Name: *Aptesis senicula* (Kriechbaumer) (Aubert 1968a: 192). Die von Aubert publizierte Festlegung dieses Exemplars als Holotypus ist ungültig (siehe Einleitung). Der zweite Syntypus (♂) ist in München unauffindbar.

Microcryptus tricolor **Kriechbaumer*, 1894**a: 243 f.
Lectotypus (♀) in Madrid.
Gültiger Name: *Aptesis flagitator* (Rossi) (Horstmann & Bordera 1995: 51).

Microcryptus zonatus **Kriechbaumer, 1893**a: 126
Lectotypus (♂) in München.
Gültiger Name: *Aptesis femoralis* (Thomson) (Aubert 1974: 268).

Mischophorus flavosignatus **Kriechbaumer*, 1894**b: 54 f.
Lectotypus (♂) hiermit festgelegt: "Hungaria merid." (vermutlich Kroatien, Rumänien oder Serbien), "*Miscophorus* [!] *flavosignatus* Kriechb. det Mocsary", "*Miscophorus* [!] *flavosignatus* Kriechb.", "= *Eurylabus larvatus* Wesm.", Budapest.
Gültiger Name: *Eurylabus larvatus* (Christ) (Berthoumieu 1897: 307). Ein weiterer Syntypus (♂) ist weder in Budapest noch in München auffindbar.

Monoblastus lateralis **Kriechbaumer*, 1896**a: 368 f.
(praeocc. in *Monoblastus* Hartig durch *Tryphon lateralis* Giraud, 1872)
Holotypus (♀) in Bruxelles (Horstmann 2002: 81).
Gültiger Name: *Monoblastus caudatus* Hartig (Kasparyan 1973: 194).

Nemeritis Rhaphidiae **Kriechbaumer*, 1892**d: 234 f.
Holotypus (♀) in München.
Gültiger Name: *Nemeritis caudatula* Thomson (Aubert 1968a: 193, Horstmann 1975: 264).

Notopygus insignis **(Förster in litt.) Kriechbaumer*, 1891**b: 251 f.
Holotypus (♀) in München.
Gültiger Name: *Notopygus insignis* Kriechbaumer (Bauer 1960: 66).

Notopygus nigricornis **Kriechbaumer*, 1891**b: 252
Lectotypus (♀) in München.
Gültiger Name: *Notopygus nigricornis* Kriechbaumer (Bauer 1960: 70). Die Art wurde nach 4♀♀ beschrieben, davon 1♀ aus München-Pasing (Coll. Kriechbaumer) und 3♀♀ von einem unbekannten Fundort (Coll. Hartig). Von diesen ist derzeit nur das ♀ aus München auffindbar (Gaster fehlt). Die Angabe von Bauer, daß das ♀ mit dem Fundort München der "Typus" sei, wird als Festlegung eines Lectotypus interpretiert (siehe Einleitung).

Notopygus xanthocerus **(Förster in litt.) Kriechbaumer, 1891**b: 251
Holotypus (♀) in München.
Gültiger Name: *Notopygus xanthocerus* Kriechbaumer (Bauer 1960: 71, Aubert 1985: 56).

Odontomerus geniculatus **Kriechbaumer, 1889**a: 73
Lectotypus (♀) in München.
Gültiger Name: *Odontocolon geniculatus* (Kriechbaumer) (Clément 1938: 512, Townes et al. 1965: 120).

Oneista Bohemani **(Förster in litt.) Kriechbaumer*, 1892**a: 41 ff.
Lectotypus (♀) in München (Horstmann 2002: 88).
Gültiger Name: *Lagarotis ustulata* (Holmgren) (Roman 1909: 324).

Ophion curvinervis **Kriechbaumer*, 1878**c: 249 ff.
Lectotypus (♂) in München.
Gültiger Name: *Eremotylus curvinervis* (Kriechbaumer) (Aubert 1974: 271, Horstmann 1981: 419).

Ophion minutus **Kriechbaumer, 1878**e: 105
Lectotypus (♀) in München (Townes et al. 1965: 320).
Gültiger Name: *Ophion minutus* Kriechbaumer (Aubert 1974: 271).

Ophion parvulus **Kriechbaumer*, 1879**d: 104 f.
Lectotypus (♂) durch Townes et al. (1965: 320) festgelegt: "*Ophion parvulus* Krchb. ♂." (nach der Beschreibung aus München), "bei Vollenh. gewesen." (Etikett kaum leserlich), München.
Gültiger Name: *Ophion parvulus* Kriechbaumer. Aubert (1974: 271) gibt fälschlich an, daß der Lectotypus 1♀ sei. Ein weiterer Syntypus (♀) ist in München unauffindbar.

Ophion Pteridis **Kriechbaumer*, 1879**c: 89 f.
Lectotypus (♀) durch Brock (1982: 88) festgelegt: "*Ophion Pteridis* Kriechb. ♀" (nach der Beschreibung aus München), "bei Vollenh. gewesen." (Etikett kaum leserlich) (große Teile der Beine fehlen, weitere Teile des Körpers sind abgebrochen und auf ein Etikett geklebt), München.
Gültiger Name: *Ophion pteridis* Kriechbaumer. Aubert (1974: 271) bezweifelt den Typenstatus dieses Exemplars, weil er das zweite Etikett als Fundortetikett ("Vollenh. Gmünden") interpretiert. Diese Lesart ist jedenfalls irrig, und der Zweifel ist ungerechtfertigt. Weitere Syntypen (1♀, 3♂♂) sind in München unauffindbar.

Ophion Slaviceki **Kriechbaumer*, 1892**d: 233 f.
Holotypus (♂) in München (Aubert 1974: 271).
Gültiger Name: *Ophion luteus* (Linnaeus) (Brock 1982: 77 f.). Brock bezweifelt den Typenstatus dieses Exemplars, weil es nicht mit der Beschreibung übereinstimme. Hier liegt meines Erachtens ein Mißverständnis in der Terminologie vor: Die von Kriechbaumer beschriebene "Brachialader" verläuft von der Flügelbasis bis zum Flügelrand (siehe Pfankuch 1919: 57). Brock hat diese Ader vermutlich als "Brachiella" interpretiert, die vom Nervellus bis zum Flügelrand verläuft (siehe Townes 1969: 42 f.).

Ophion wuestneii (Wüstneii) **Kriechbaumer*, 1892**d: 232 f.
Holotypus (♂): "Sondbg. 5.88." (=Sønderborg/DK) (Gaster fehlt), København.
Gültiger Name: *Ophion wuestneii* Kriechbaumer (siehe die Bemerkung unter *Ichneumon wuestneii*). Man bestimmt die Art bei Brock (1982) als *O. luteus* (Linnaeus), aber die Mandibeln sind wie in Fig. 37 (p. 72) gebildet. Die Festlegung eines Neotypus durch Aubert (1968a: 194) ist nach Artikel 75 der Nomenklaturregeln (Fassung von 1961) ungültig (Aubert 1972: 152).

Paniscus lineatus **Kriechbaumer, 1890**a: 484 (praeocc. durch *P. lineatus* Brullé, 1846)
Lectotypus (♀) in München.
Gültiger Name: *Netelia thomsoni* (Brauns) (Delrio 1975: 34).

Paniscus nigricans **Kriechbaumer, 1898**b: 171 f.
Lectotypus (♂) in Madrid (Delrio 1975: 56).
Gültiger Name: *Netelia dilatata* (Thomson) (Tolkanitz 1981: 101).

Parabatus Millieratae **Kriechbaumer, 1897**b: 316 f.
Syntypen (4♀♀, 6♂♂) in München unauffindbar.
Gültiger Name: *Netelia millieratae* (Kriechbaumer) (Delrio 1975: 27).

Perilissus buccatus **Kriechbaumer, 1896**b: 133 f.
Holotypus (♂) in Budapest unauffindbar.
Taxon uninterpretiert.

Perosis albopicta **Kriechbaumer*, 1892**c: 214 ff.
Holotypus (♀) in München (Aubert 1974: 266).
Gültiger Name: *Schreineria populnea* (Giraud) (Horstmann 1990: 83).

Perosis gracilis **Kriechbaumer*, 1892**c: 216 f.
Holotypus (♀) in München (Aubert 1974: 266).
Gültiger Name: *Schreineria cingulipes* (Förster) (Horstmann 1990: 82, Yu & Horstmann 1997: 286).

Pezomachus canaliculatus **Kriechbaumer*, 1896**b: 129 (praeocc. durch *P. canaliculatus* Förster, 1850)
Lectotypus (? Holotypus) (♀) in Budapest (Aubert 1974: 270).
Gültiger Name: *Gelis stevenii* (Gravenhorst) (Schwarz 1995: 29). Der Typus trägt das Fundortetikett "Rimaszombat" (= Rimavská Sobota/SK).

Pezomachus sesquifasciatus **Kriechbaumer*, 1899**: 301 ff.
Lectotypus (♀) hiermit festgelegt: "85./84." (nach der Beschreibung aus der Umgebung von München),

"*Pezomachus sesquifasciatus* mihi ♀.", "*Pezomachus corruptor* Frst. var. a.", Budapest.
Gültiger Name: *Gelis proximus* (Förster) (Schwarz 1995: 37). Die Typen von *P. sesquifasciatus* gehören zu einem umfangreichen Material der Gattung *Gelis* Thunberg, das offensichtlich aus der Zoologischen Staatssammlung in München stammt, aber aus einem unbekanntem Grund und zu einem unbekannten Zeitpunkt an das Museum in Budapest gekommen ist. Ich hatte den Lectotypus und drei Paralectotypen (♀♀) vor vielen Jahren bei einem Besuch in Budapest beschriftet, und Schwarz hat für seine Revision nur einen Paralectotypus zur Untersuchung erhalten.

***Phaeogenes* (?) *balearicus* Kriechbaumer*, 1894**a: 241
Lectotypus (♂) in Madrid.
Gültiger Name: *Centeterus balearicus* (Kriechbaumer) (Horstmann & Bordera 1995: 50).

***Phaeogenes bacilliger* Kriechbaumer*, 1891**a: 10 f.
Lectotypus (♀) in München (Aubert 1974: 264).
Gültiger Name: *Phaeogenes bacilliger* Kriechbaumer (Sawoniewicz 2003: 223).

***Phaeogenes bellulus* Kriechbaumer*, 1894**a: 241 f.
Lectotypus (♂) in Madrid.
Gültiger Name: *Diadromus collaris* (Gravenhorst) (Horstmann & Bordera 1995: 50).

***Phaeogenes grammostoma* Kriechbaumer, 1887**c: 309.
Holotypus (♂) in Bern.
Gültiger Name: *Tycherus modestus* (Wesmael) (Aubert 1974: 264, 1991: 278).

***Phygadeuon anthracinus* Kriechbaumer*, 1894**a: 244 f.
Lectotypus (♀) in Madrid.
Gültiger Name: *Phygadeuon troglodytes* Gravenhorst (Horstmann & Bordera 1995: 51).

***Phygadeuon Atropos* Kriechbaumer*, 1892**f: 346
Lectotypus (♀) in München.
Gültiger Name: *Phygadeuon atropos* Kriechbaumer (Aubert 1968a: 193, 1974: 268, Horstmann 2001c: 222).

***Phygadeuon balearicus* Kriechbaumer*, 1894**a: 245
Lectotypus (♂) in Madrid.
Gültiger Name: *Ethelurgus balearicus* (Kriechbaumer) (Horstmann & Bordera 1995: 52).

***Phygadeuon Clotho* Kriechbaumer*, 1892**f: 344 f.
Lectotypus (♀) in München.
Gültiger Name: *Phygadeuon clotho* Kriechbaumer (Aubert 1974: 269, Horstmann 2001c: 217).

***Phygadeuon decisus* Kriechbaumer, 1892**f: 347 f.
Syntypen (3♂♂) in München unauffindbar.
Taxon uninterpretiert.

***Phygadeuon forticornis* Kriechbaumer*, 1892**f: 344
Holotypus (♀) in München.
Gültiger Name: *Phygadeuon forticornis* Kriechbaumer (Aubert, 1974: 269, Horstmann 2001c: 222).

***Phygadeuon geniculatus* Kriechbaumer*, 1892**f: 343 f.
Lectotypus (♀) in München.
Gültiger Name: *Phygadeuon geniculatus* Kriechbaumer (Aubert 1974: 269, Horstmann 2001c: 214).

***Phygadeuon Lachesis* Kriechbaumer*, 1892**f: 345 f.
Lectotypus (♀) in München.
Gültiger Name: *Phygadeuon lachesis* Kriechbaumer (Aubert 1974: 269, Horstmann 2001c: 221).

***Phygadeuon micromelas* Kriechbaumer*, 1894**a: 245
Lectotypus (♂) in München.
Gültiger Name: *Gelis exareolatus* (Förster) (Aubert 1974: 269, Horstmann & Bordera 1995: 52).

***Pimpla (Epiurus) balearica* Kriechbaumer*, 1894**a: 248 f.
Syntypus (♀ nach der Beschreibung) in Madrid (Horstmann & Bordera 1995: 52),
Gültiger Name: *Scambus brevicornis* (Gravenhorst) (Schmiedeknecht 1934: 139).

***Pimpla capulifera* Kriechbaumer, 1887**b: 119
Holotypus (♀) in München.
Gültiger Name: *Apechthis capulifera* (Kriechbaumer) (Townes et al. 1965: 42).

***Pimpla castaniventris* Kriechbaumer*, 1894**c: 51
Holotypus (♀) in Pretoria (Horstmann 1988: 98).
Gültiger Name: *Itoplectis maculator cruentata* (Rudow) (Horstmann 1993b: 30).

***Pimpla cincticarpus* Kriechbaumer, 1895**c: 260 ff.
Holotypus (♀) in Bern unauffindbar.
Gültiger Name: *Scambus cincticarpus* (Kriechbaumer) (Perkins 1943: 268, Fitton et al. 1988: 53). Perkins hat den Holotypus noch revidiert.

***Pimpla cingulata* Kriechbaumer*, 1894**a: 249 (praeocc. durch *P. cingulata* Ratzeburg, 1852).
Lectotypus (♂) in Madrid.
Gültiger Name: *Zaglyptus varipes* (Gravenhorst) (Horstmann & Bordera 1995: 53).

Pimpla concors **Kriechbaumer, 1890**a: 482 f.
Lectotypus (♂) in Wien.
Gültiger Name: *Tromatobia ornata* (Gravenhorst) (Oehlke 1967: 17). Aubert (1968a: 192) hat den Lectotypus fälschlich als Holotypus bezeichnet.

Pimpla curticauda **Kriechbaumer*, 1887**b: 120 f.
Holotypus (♀): "M. Hess. 26.6.69 Krchb." (= München-Hesselohe), "69./862.", "Bavar. *curticauda* Krchb.", München.
Gültiger Name: *Itoplectis curticauda* (Kriechbaumer) (Seyrig 1932: 117).

Pimpla meridionalis **Kriechbaumer*, 1887**b: 120
Holotypus (♀): "*Repandum* Chiclana" (in Spanien), "K. 1880", "*Pimpla meridionalis* m. ♀.", München.
Gültiger Name: *Itoplectis viduata* (Gravenhorst) (Perkins 1941: 646).

Pimpla (Ctenopimpla) Perezi **Kriechbaumer, 1898**b: 170 f.
Holotypus (♀) in Madrid (Aubert 1978: 65).
Gültiger Name: *Odinophora dorsalis* (Gravenhorst) (Rey del Castillo & Scaramozzino 1991: 254).

Pimpla quadricolor **Kriechbaumer*, 1894**c: 52
Holotypus (♀) in Pretoria.
Gültiger Name: *Tromatobia quadricolor* (Kriechbaumer) (Horstmann 1988: 98).

Pimpla Ratzeburgii **Kriechbaumer*, 1887**b: 84
Lectotypus (♀) in München (Horstmann 2002: 88).
Gültiger Name: *Acropimpla pictipes* (Gravenhorst) (Schmiedeknecht 1888: 502).

Pimpla Schmiedeknechti **Kriechbaumer*, 1888**b: 339 f.
Holotypus (♀): "Corfu 1887 Schmkn.", "Corfu. *Schmiedeknechti* m. ♀.", München.
Gültiger Name: *Exeristes roborator* (Fabricius) (Strobl 1902: 11).

Pimpla semivaria **Kriechbaumer*, 1894**a: 247 f.
Syntypus (♀ nach der Beschreibung) in Madrid (Horstmann & Bordera 1995: 52).
Gültiger Name: *Tromatobia ornata* (Gravenhorst) (Schmiedeknecht 1934: 104).

Pimpla stramentaria **Kriechbaumer, 1890**a: 483
Holotypus (♀) in Wien.
Gültiger Name: *Scambus planatus* (Hartig) (Oehlke 1966c: 189 f.).

Pimpla tricolor **Kriechbaumer*, 1894**a: 248 (praeocc. durch *P. tricolor* Spinola, 1840)
Lectotypus (♂) in München.
Gültiger Name: *Tromatobia ornata* (Gravenhorst) (Oehlke 1967: 17 f., Horstmann & Bordera 1995: 52).

Pithotomus rufiventris **Kriechbaumer*, 1888**e: 33 f.
Lectotypus (♀) in Wien (Aubert 1981: 314).
Gültiger Name: *Pithotomus rufiventris* Kriechbaumer. Da die Art eindeutig nach 2♀♀ beschrieben wurde, ist die Festlegung eines Holotypus durch Heinrich (1978: 77) ungültig (siehe Einleitung), und die Festlegung durch Aubert ist gültig. Das von Heinrich in München als Holotypus festgelegte Exemplar (♀) ist ein Paralectotypus.

Platylabus auriculatus **Kriechbaumer, 1890**b: 200 ff.
Lectotypus (♂) in München (Aubert 1974: 263).
Gültiger Name: *Platylabus auriculatus* Kriechbaumer.

Platylabus fornicatus **Kriechbaumer*, 1890**a: 481 f.
Holotypus (♀): "Umgeb. Wiens ex lepid.", "März 888 ..." (auf der Unterseite des Etiketts), "*Platylabus fornicatus* m. ♀. n. sp. Type det. Kriechbaumer", Wien.
Gültiger Name: *Platylabus iridipennis* (Gravenhorst) (syn. nov.). Aubert (1981: 314) hat den Holotypus fälschlich als Lectotypus bezeichnet. Die Art wurde nach Perkins (1959: 56) determiniert: Mundleiste stark erhöht, Hinterfemora ganz rot, Hintertibien rot, das apicale Drittel schwarz.

Platylabus frustatae **Kriechbaumer*, 1888**e: 34 f.
Lectotypus (♀) in Wien (Aubert 1981: 314).
Gültiger Name: *Platylabops haematomerus* (Holmgren) (syn. nov.). Berthoumieu (1897: 320) hat den Typenfundort Rhoden (in Hessen/D) fälschlich als "Rhodes" (= Rhodos/GR) interpretiert, und viele Autoren sind ihm darin gefolgt. Als Paralectotypen von *P. frustatae* sind in Wien 1♀ und 3♂♂ vorhanden. Rasnitsyn & Siitan (1981: 577) stellen die Art *Ichneumon haematomerus* Holmgren, die sonst als uninterpretiert gilt (Hilpert 1992b: 15), in die Gattung *Platylabops* Heinrich, vermutlich aufgrund von Material in der Sammlung Heinrich/München (2♂♂ von Col du Tourmalet/Hautes Pyr./F). Merkmale von *P. haematomerus*: Präpectalleiste hinter den Vordercoxen deutlich erhöht, Gaster schwarz, die mittleren Tergite teilweise caudal schmal rot gerandet und/oder stellenweise dunkelbraun überlaufen; beim ♂ Geißel gedrungen, zweites Geißelglied 1,7-1,8-mal so lang wie breit, Glieder bei 0,7 der Länge deutlich breiter als lang, Tyloide groß, an 7-9 Geißelgliedern; beim ♀ Zwischenraum zwischen den Thyridien sehr dicht gerunzelt. In anderen Merkmalen stimmt *P. haematomerus* recht gut mit *P. apricus* (Gravenhorst) überein.

Platylabus gigas **Kriechbaumer*, 1886**: 243 f.
Holotypus (♀): "Sdbg. 28.6.85" (= Sønderborg/DK), "♀", "Type der Beschreibung Kriechbaumers", "*gigas* Krchb.", "Coll. Wüstnei", København.
Gültiger Name: *Platylabus gigas* Kriechbaumer.

Platylabus lariciatae **Kriechbaumer, 1890**b: 202 f.
Lectotypus (♀) in München (Aubert 1981: 315).
Gültiger Name: *Platylabops lariciatae* (Kriechbaumer) (Rasnitsyn & Siitan 1981: 577).

Platylabus suborbitalis **Kriechbaumer*, 1894**b: 55
Holotypus (♀): "Bihar vm Pável" (= Distrikt Crisana/RO), "*Platylabus suborbitalis* Kriechb.", "*Platylabus suborbitalis* Kriechb. typ.", Budapest.
Gültiger Name: *Platylabus vibratorius* (Thunberg) (syn. nov.).

Platylabus vibicariae **Kriechbaumer, 1888**e: 34
Holotypus (♀) in Wien (Aubert 1981: 315).
Gültiger Name: *Platylabus vibicariae* Kriechbaumer.

Polyblastus bicingulatus **Kriechbaumer, 1898**b: 169 f.
Holotypus (♀) in Madrid unauffindbar.
Taxon uninterpretiert.

Polyblastus binotatus **Kriechbaumer*, 1897**a: 190 f.
Lectotypus (♂) von Aubert festgelegt: "Trostbg. Jemill." (= Trostberg/D), "12/486.", München.
Gültiger Name: *Rhorus binotatus* (Kriechbaumer) (Aubert 1968b: 102).

Polyblastus phygadeuontoides **Kriechbaumer*, 1896**a: 367
Holotypus (♀) in München.
Gültiger Name: *Euryproctus ratzeburgi* (Gorski) (Horstmann 2002: 81).

Polyomorus gagatinus **Kriechbaumer*, 1894**d: 60 f.
Lectotypus (♀) von Diller beschriftet und hiermit festgelegt: "Worms 29.6.91. Haberm.", "316.", "German. 1. *gagatinus* Krchb. ♀.", München.
Gültiger Name: *Ctenopelma tomentosum* (Desvignes) (Townes et al. 1965: 239, Aubert 2000: 102, Shaw et al. 2003: 138). Ein Paralectotypus (♀) aus Madsk bei Sønderborg/DK befindet sich in København.

Probolus Slaviceki **Kriechbaumer* 1893**b: 264 f.
Holotypus (♀) in München.
Gültiger Name: *Probolus concinnus* Wesmael (Horstmann 2000c: 296).

Pseudacoenites Moravicus **Kriechbaumer*, 1892**c: 219 f.
Holotypus (♀): "Moravia Milkov Slavicek" (bei Prostějov/CZ), "*Pseudacoenites Moravicus* m. ♀.", München.
Gültiger Name: *Theronia laevigata* (Tschek) (Krieger 1902: 189 f.).

Psilomastax cyaneus **Kriechbaumer*, 1892**b: 101
Lectotypus (♀) in München (Aubert 1981: 313).
Gültiger Name: *Trogus violaceus* (Mocsáry) (Mocsáry 1892: 208). Der Lectotypus trägt das gedruckte Etikett "Bamberg Funk". Bamberg/D war der Wohnort des Sammlers Funk. Nach der Beschreibung wurde der Typus mit den Puppen des Wirts *Papilio hospiton* Guenée (Papilionidae) auf Sardinien gesammelt und in Deutschland zum Schlüpfen gebracht (Horstmann 2000b: 47). Als Paralectotypen sind in München 6♀♀ vorhanden.

Psilomastax pictus **Kriechbaumer, 1882**a: 176
Lectotypus (♀) in München (Aubert 1981: 313).
Gültiger Name: *Psilomastax pyramidalis* Tischbein (Townes 1957: 103). Die Vergabe eines neuen Namens für die von Tischbein beschriebene Art durch Kriechbaumer war unbegründet.

Pyracmon pectoralis **Kriechbaumer, 1890**a: 484
Holotypus (♂) in Wien unauffindbar.
Gültiger Name: *Rhimphoctona pectoralis* (Kriechbaumer) (Horstmann 1980: 23).

Rhorus conspicuus **(Förster in litt.) Kriechbaumer*, 1891**b: 249
Holotypus (♂) in München.
Gültiger Name: *Rhorus punctus* (Gravenhorst) (Horstmann 2001b: 83).

Rhorus spectabilis **(Förster in litt.) Kriechbaumer*, 1891**b: 247 f. (praeocc. in *Rhorus* Förster durch *Ctenopelma spectabilis* Rudow, 1882)
Lectotypus (♀) in München.
Gültiger Name: *Rhorus punctus* (Gravenhorst) (Horstmann 2001b: 83).

Rhyssa approximator **Gravenhorst (!) var.** ***maculicoxis*** **Kriechbaumer*, 1889**a: 317 f.
Lectotypus (♀) in München (Kerrich 1966: 44).
Gültiger Name: *Pseudorhyssa nigricornis* (Ratzeburg) (Horstmann 1999: 52).

Rhyssa approximator **Gravenhorst (!) var.** ***ruficoxis*** **Kriechbaumer*, 1887**b: 249 f.
Holotypus (♀): "Beuerbg. 8.6.85 Krchb." (= Beuerberg/Starnberger See/D), München.

Gültiger Name: *Pseudorhyssa alpestris* (Holmgren) (Kerrich 1966: 44). Obwohl Townes den Holotypus beschriftet hat, ist nicht sicher, ob die Bearbeitung in Townes & Townes (1960: 373) auf einer Typenrevision fußt, denn in dieser Arbeit ist die Art falsch interpretiert worden (Kerrich, l. c.).

Rhyssa lineolata **Kriechbaumer*, 1887b**: 81 f. (praeocc. in *Rhyssa* Gravenhorst durch *Cryptocentrum lineolatum* Kirby, 1837)
Holotypus (♀) in München.
Gültiger Name: *Rhyssa kriechbaumeri* Ozols (Horstmann 2002: 86).

Rynchobanchus bicolor **Kriechbaumer*, 1894b**: 60
Holotypus (♀): "Hungaria merid." (vermutlich Kroatien, Rumänien oder Serbien), "904/67.", "Typus *Rhynchobanchus* [!] *bicolor* Kriechb.", Budapest.
Gültiger Name: *Rynchobanchus bicolor* Kriechbaumer.

Sagaritis balearica **Kriechbaumer*, 1894a**: 250
Lectotypus (♂) in Madrid.
Gültiger Name: *Hyposoter* (?) *balearicus* (Kriechbaumer) (Horstmann & Bordera 1995: 53).

Sagaritis* (?) *dorsalis **Kriechbaumer, 1894a**: 251 f.
Syntypen (? Holotypus) (♀♀) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Taxon uninterpretiert (Horstmann & Bordera 1995: 53).

Sagaritis* (?) *Moraguesi **Kriechbaumer*, 1894a**: 252 f.
Lectotypus (♀) in Madrid.
Gültiger Name: *Diadegma moraguesi* (Kriechbaumer) (Horstmann & Bordera 1995: 53).

Sagaritis periscelis **Kriechbaumer, 1894a**: 250 f.
Syntypen (♀, ♂) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Taxon uninterpretiert (Horstmann & Bordera 1995: 53).

Sagaritis trochanterata **Kriechbaumer*, 1894a**: 251
Lectotypus (♀) in München.
Gültiger Name: *Campoletis annulata* (Gravenhorst) (Aubert 1974: 272, Horstmann & Bordera 1995: 53).

Schizopyga atra **Kriechbaumer, 1887b**: 86 f.
Lectotypus (♀) in München (Oehlke 1967: 21).
Gültiger Name: *Schizopyga frigida* Cresson (Townes & Townes 1960: 225). Der von Aubert (1968a: 192) festgelegte Lectotypus ist ungültig (Šedivý 1969: 78).

Sphalerus bifasciatus **Kriechbaumer*, 1878a**: 43 ff.
Holotypus (♂): "Mehad. Mocsáry" (= Mehadia/RO), "Eur. mer. 1. *albicinctus* Gr.", München.
Gültiger Name: *Arotes albicinctus* Gravenhorst (Kriechbaumer 1878c: 251 f.). Ein weiteres ♂ vom Typenfundort, das ebenfalls als Holotypus beschriftet ist, befindet sich in Budapest. Aus folgenden Gründen wird das Exemplar in München als Holotypus anerkannt: Kriechbaumer (1878c: 251) hat nur 1♂ gesehen. Nur der Holotypus in München besitzt die in der Beschreibung erwähnte glatte Mittellängslinie auf dem Mesoscutum (Kriechbaumer 1878a: 43).

Spilocryptus brevipennis **Kriechbaumer*, 1893a**: 54 (praeocc. in *Agrothereutes* Förster durch *Cryptus brevipennis* Marshall, 1867)
Holotypus (♀): "Coll^e P. Magretti ex Coll^e Gribodo" (nach der Beschreibung aus Piemonte/I), "34.70", "*brevipennis* m. ♀.", "*Sp. brevipennis* Kriechb." (große Teile der Fühler fehlen), Genova.
Gültiger Name: *Agrothereutes abbreviatus* (Fabricius) var. (Horstmann 1993a: 137).

Spilocryptus claviventris **Kriechbaumer* in Schletterer, 1894**: 14 ff.
Lectotypus (♀) hiermit festgelegt: "Pola Schlett." (= Pula/Kroatien), Wien.
Gültiger Name: *Aritranis claviventris* (Kriechbaumer) (Schwarz & Shaw 1998: 112). Ein Paralectotypus (♀) ist in Wien ebenfalls vorhanden.

Spilocryptus Magrettii **Kriechbaumer, 1893a**: 54 f.
Holotypus (♀) in Genova (Schwarz & Shaw 1998: 112).
Gültiger Name: *Hoplocryptus magrettii* (Kriechbaumer) (Sawoniewicz 2003: 218).

Spilocryptus nigricornis **Kriechbaumer, 1896b**: 128 f.
Holotypus (♀) in Budapest (Schwarz 1988: 41).
Gültiger Name: *Idiolispa grossa* (Gravenhorst) (Habermehl 1925-1926: 107). Schwarz hat den Holotypus fälschlich als Lectotypus bezeichnet (Beschreibung: "Von dem einzigen Exemplar des *grossus* ... ist das vorliegende [Exemplar] des *nigricornis* ...").

Spilocryptus pumilus **Kriechbaumer*, 1899**: 69 f.
Lectotypus (♀) in München.
Gültiger Name: *Agrothereutes pumilus* (Kriechbaumer) (Aubert 1968a: 192, Horstmann 1968: 126). Das Taxon ist möglicherweise ein Synonym von *A. hospes* (Tschek) (Horstmann, l. c.).

Stenolabis cingulata **Kriechbaumer, 1894**d: 58 f.
Holotypus (♀) in München unauffindbar.
Gültiger Name: *Diacritus aciculatus* (Snellen van Vollenhoven) (Perkins 1940: 55). Townes (1969: 130) deutet an, den Holotypus untersucht zu haben, aber ich konnte diesen nicht finden.

Synomelix Sieboldii **Kriechbaumer, 1897**a: 189 f.
Holotypus (♀) in München.
Gültiger Name: *Synomelix albipes* (Gravenhorst) (Idar 1983: 169).

Thalessa flavonotata **Kriechbaumer*, 1896**b: 135 f.
Holotypus (♂) in Budapest (Oehlke 1967: 40).
Gültiger Name: *Megarhyssa rixator* (Schellenberg) (Horstmann 1998b: 342).

Tropistes rufipes **Kriechbaumer*, 1894**f: 260 f.
Lectotypus (♀) in München (Aubert 1974: 270).
Gültiger Name: *Tropistes falcatus* (Thomson) (Horstmann 1976: 24).

Tryphon (Mesoleius) balearicus **Kriechbaumer, 1894**a: 245 f.
Syntypen (? Holotypus) (♀♀) höchstwahrscheinlich in der Sammlung Moragues/Mallorca zerstört.
Taxon uninterpretiert (Horstmann & Bordera 1995: 52).

Tryphon bilineolatus **Kriechbaumer, 1897**a: 189 f.
Holotypus (♂) in München unauffindbar.
Taxon uninterpretiert (Kasparyan 1969: 648). Das von Strobl (1903: 26) unter diesem Namen erwähnte Material (Coll. Strobl/Admont) weicht in vielen Punkten von der Beschreibung ab und kann zur Interpretation der Art nicht herangezogen werden.

Udenia Herrichii **(Förster in litt.) Kriechbaumer, 1892**a: 40 f.
Syntypen (6♂♂) in München unauffindbar (Aubert 1968a: 193).
Gültiger Name: *Perilissus rufoniger* (Gravenhorst) (Roman 1914: 30 f.). Roman hat noch einen Typus von *U. herrichii* in München untersucht, der jetzt verschollen ist. Dagegen sind in der Sammlung Kriechbaumer/München unter dem Namen *P. vernalis* (Gravenhorst) 5♀♀ von München-Schleißheim vorhanden, die die Fanddaten 27.5.1884 und 25.5.1885 tragen und deshalb anscheinend aus denselben Fangserien stammen wie ein Teil der Syntypen von *U. herrichii*. Ihnen fehlt allerdings jeder Hinweis auf diese Art. Meine Bemerkungen zu dieser Art und zu *P. punctatissimus* Strobl (Horstmann 2001b: 81) sind durch Aubert (2000: 33 f.) überholt.

Xylonomus brachylabis **Kriechbaumer, 1889**a: 75 ff.
Lectotypus (♀) in München.
Gültiger Name: *Xorides brachylabis* (Kriechbaumer) (Clément 1938: 565, Townes et al. 1965: 123).

Xylonomus clavicornis **Kriechbaumer*, 1879**b: 168 f.
Lectotypus (♀) hiermit festgelegt: "Triest 11.5.71. Krchb.", "125.", München.
Gültiger Name: *Xorides gravenhorstii* (Curtis) (Yu & Horstmann 1997: 944). Drei Paralectotypen (♀♀) sind in München vorhanden.

Xylonomus Corcyrensis **Kriechbaumer* in Schletterer, 1894**: 22 f.
Holotypus (♀): "Corfu 1881. Schmkn.", "*Xylonomus Corcyrensis* Krchb. ♀.", München.
Gültiger Name: *Xorides corcyrensis* (Kriechbaumer) (Oehlke 1964: 573). Kriechbaumer gibt nicht klar an, nach wievielen ♀♀ er die Art beschrieben hat. Clément (1938: 524) bezeichnet das angeführte Exemplar als die "Type".

Xylonomus ephialtoides **Kriechbaumer, 1882**e: 151
Lectotypus (♀) in München.
Gültiger Name: *Xorides ephialtoides* (Kriechbaumer) (Clément 1938: 546, Townes et al. 1965: 123).

Xylonomus fasciipennis **Kriechbaumer* in Schletterer, 1894**: 22 ff.
Holotypus (♀): "Pola 10.6.93. Schlett." (= Pula/Kroatien), "*Xylonomus fasciipennis* Krchb. ♀.", München.
Gültiger Name: *Xorides annulator* (Fabricius) (Townes et al. 1965: 543). Kriechbaumer gibt nicht klar an, nach wievielen ♀♀ er die Art beschrieben hat. Clément (1938: 527) bezeichnet das angeführte Exemplar als "die Kriechbaumersche Type".

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Literatur

Atanasov, A. 1977. [A contribution to the system of the Palearctic ichneumonids belonging to the genus *Habronyx* (Hymenoptera, Ichneumonidae).] [russisch] – Acta zool. Bulg. **7**: 37-45

Aubert, J.-F. 1961. Révision des travaux concernant les Ichneumonides de France et 3[me] supplément au catalogue de Gaulle (80 espèces nouvelles pour la faune française). – Bull. mens. Soc. Linn. Lyon **30**: 206-211

-- 1962. Les Ichneumonides du rivage méditerranéen français (4[e] série, Alpes-maritimes). – Rev. Fr. Ent. **29**: 124-153

-- 1963. Les Ichneumonides du rivage méditerranéen français (5[e] série, Département du Var). – Vie et Milieu **14**: 847-878

-- 1966a. Révision des traveaux concernant les Ichneumonides de France et 5[e] supplément au catalogue de Gaulle (90 espèces nouvelles pour la faune de France). – Bull. mens. Soc. Linn. Lyon **35**: 81-90

-- 1966b. Les Ichneumonides du rivage méditerranéen français (9[e] série: Ouest de l'Hérault et Aude) (Hym.). – Bull. Soc. ent. Fr. **71**: 100-108

-- 1968a. Fixations des types, lectotypes et paratypes dans les collections d'Ichneumonides, et première liste de types perdus ou conservés. – Mitt. Schweiz. ent. Ges. **41**: 175-201

-- 1968b. Ichneumonides non pétiolées inédites et révision partielle des genres *Phytodietus* Grav. et *Netelia* Gray. – Bull. Soc. ent. Mulhouse **1968**: 93-103

-- 1969a. Supplément aux Ichneumonides non pétiolées inédites et révision du genre *Erromenus* Holm. – Bull. Soc. ent. Mulhouse **1969**: 37-46

-- 1969b. Prélude à une révision des Ichneumonides Banchinae (=Lissonotinae) ouest-paléarctiques. – Bull. Soc. ent. Mulhouse **1969**: 85-94

-- 1971. Les Ichneumonides du rivage méditerranéen français (Hym.) (11[e] série). – Bull. Soc. ent. Fr. **76**: 210-221

-- 1972. Étude commentée de nouveaux lectotypes choisis dans les collections Holmgren et Thomson (Hym. Ichneumonidae). – Ent. scand. **3**: 145-152

-- 1974. Recherches des types de Kriechbaumer au muséum de Munich (Ichneum. Cyclopneustinae, Cryptinae et Ophioninae). – Bull. mens. Soc. Linn. Lyon **43**: 262-272

-- 1978. Les Ichneumonides ouest-paléarctiques et leurs hôtes. 2. Banchinae et suppl. aux Pimplinae. – Échauffour, 318 pp.

-- 1981. Ichneumoninae de Kriechbaumer, et quelques autres types conservés à Munich et à Vienne. – Spixiana **4**: 305-315

-- 1985. Ichneumonides Scolobatinae des colections suédoises (suite) et du Musée de Leningrad. – Bull. Soc. ent. Mulhouse **1985**: 49-58

-- 1991. Pour une nouvelle révision des Ichneumonides Phygadeuontini, Banchinae, Scolobatinae, Ophioninae sensu lato et Ichneumoninae (Hymenoptera). – Nouv. Rev. Ent. (N. S.) **8**: 267-286.

-- 1992. Cinquième prélude à une révision des Ichneumonides Scolobatinae (Ctenopelmatinae). – Bull. Soc. ent. Mulhouse **1992**: 1-7

-- 2000. Les Ichneumonides ouest-paléarctiques et leurs hôtes. 3. Scolobatinae (=Ctenopelmatinae) et suppl. aux volumes précédents. – Litterae Zoologicae (Lausanne) **5**: 310 pp.

Bachmaier, F. 1979. Das in der Zoologischen Staatssammlung München aufbewahrte Typenmaterial der Gattung *Dusona* Cameron 1900 (=*Campoplex* auct.) und sein Erhaltungszustand (Hymenoptera, Ichneumonidae, Porizontinae). – Spixiana **2**: 69-93

Barron, J. R. 1978. Systematics of the World Eucerotinae (Hymenoptera, Ichneumonidae). Part II: Non-Nearctic species. – Naturaliste can. **105**: 327-374

Bauer, E. 1927. Über *Glypta exophthalmus* Kriechb. und *biauriculata* Strobl. – Ent. Mitt. **16**: 425-428

Bauer, R. 1960. Die Ctenopelmatinen-Gattungen *Notopygus* Holmgren und *Homaspis* Förster. – Zool. Anz. **164**: 64-75

Berthoumieu, V. 1897. Ichneumonides d'Europe et des pays limitrophes. – Ann. Soc. ent. Fr. **65** (1896): 285-418

-- 1904. Hymenoptera, Fam. Ichneumonidae, Subfam. Ichneumoninae. – Genera Insectorum, Fasc. 18. – Bruxelles, 87 pp. & 2 Tab.

Brauns, S. 1901. Nachträge zu den Lissonotinen. – Z. syst. Hymenopt. Dipt. **1**: 177-183

Brock, J. P. 1982. A systematic study of the genus *Ophion* in Britain (Hymenoptera, Ichneumonidae). – Tijdschr. Ent. **125**: 57-97

Ceballos, G. 1931. Estudios sobre Icneumónidos de España. II. Subfamilia Cryptinae (tribu Cryptini). – Trab. Mus. Nac. Cienc. Nat. Madrid, Ser. Zool. **56**: 206 pp.

Clément, E. 1930. Opuscula hymenopterologica III. Die Paläarktischen *Metopius*-Arten (Hym., Ichneum.) – Konowia **8** (1929): 325-437

-- 1938. Opuscula hymenopterologica IV. Die paläarktischen Arten der Pimplinentribus Ischnocerini, Odontomerini, Neoxoridini und Xylomini (Xoridini Schm.). – Festschrift Embrik Strand **4**: 502-569

Dalla Torre, C. G. de. 1902. Catalogus Hymenopterorum hucusque descriptorum systematicus et synonymicus. III: Trigonalidae, Megalyridae, Stephanidae, Ichneumonidae, Agriotypidae, Evaniidae, Pelecinidae. – Lipsiae, pp. 545-1141

Delrio, G. 1975. Révision des espèces ouest-paléarctiques du genre *Netelia* Gray (Hym., Ichneumonidae). – Studi Sassaresi, Sez. III, **23**: 126 pp.

Diller, E., & K. Horstmann. 1997. Typenrevision der von Victor Berthoumieu beschriebenen Ichneumoninae (ohne Phaeogenini) (Insecta, Hymenoptera, Ichneumonidae). – Spixiana **20**: 39-71

Fitton, M. G., M. R. Shaw & I. D. Gauld 1988. Pimpline ichneumon-flies. Hymenoptera, Ichneumonidae (Pimplinae). – Handbk. Ident. Br. Insects, Vol. 7, Part 1: 110 pp.

Grönblom, T. 1964. Einige aus Schmetterlingszuchten hervorgegangene Schlupfwespen (Hym., Ichneumonoidea). –Ann. Ent. Fenn. **30**: 104-111

Gupta, V. K. 1985. A review of the tribe Neoxoridini of the World (Hymenoptera: Ichneumonidae: Pimplinae). – Orient. Ins. **19**: 323-329

Habermehl, H. 1919. Beiträge zur Kenntnis der palaearktischen Ichneumonidenfauna. – Z. wiss. Insektenbiol. **14**: 285-292

-- 1925-1926. Beiträge zur Kenntnis der Cryptinengattungen *Spilocryptus* und *Hoplocryptus* C. G. Thoms. (Hym. Ichneum.). – Neue Beitr. syst. Insektenkunde **3**: 101-111 (1925), 137-146, 149-154, 165-169 (1926)

Heinrich, G. 1929. Beiträge zur Kenntnis der Insektenfauna Nordpersiens. Nach der Ausbeute der Elbrus-Expedition von G. Heinrich und Dr. M. Dammholz Anno 1927. Ichneumonidae (Hym.). – Dt. ent. Z. **1929**: 305-326

-- 1930a. Zur Systematik der Ichneumonidae stenopneusticae III. – Konowia **9**: 90-92

-- 1930b. Beitrag zur Kenntnis der Ichneumonidenfauna Jugoslaviens. – Konowia **9**: 118-126

-- 1937. Zur Systematik der Ichneumoninae stenopneusticae VIII (Hym.). – Mitt. Dt. ent. Ges. **8**: 51-54

-- 1953. Ichneumoniden der Steiermark (Hym.). – Bonn. zool. Beitr. **4**: 147-185

-- 1961. Synopsis of Nearctic Ichneumoninae Stenopneusticae with particular reference to the northeastern region (Hymenoptera). Part IV. Synopsis of the Ichneumonini: genera *Chasmias, Neamblymorpha, Anisopygus, Limerodops, Eupalamus, Tricholabus, Pseudamblyteles, Eutanyacra, Ctenichneumon, Exephanes, Ectopimorpha, Pseudoamblyteles.* – Can. ent., suppl. **23**: 369-505

-- 1973. Bemerkenswerte Ichneumoninae aus dem Gebiet der Südalpen. – NachrBl. bayer. Ent. **22**: 49-56

-- 1978. [Ostpaläarktische Hautflügler (Insekten) der Unterfamilie Ichneumoninae.] [russisch] – Leningrad, 81 pp.

-- 1980a. Contribution to the knowledge of the Western Palearctic species of *Anisobas* Wesmael (Ichneumonidae, Ichneumoninae). – Spixiana **3**: 225-238

-- 1980b. Burmesische Ichneumoninae XI. Tribus Ichneumonini (5. Teil). – Ann. Zool. **35**: 117-191

Hellén, W. 1941. Zur Ichneumonidenfauna Finnlands (Hym.) II. – Notul. ent. **20** (1940): 42-53

Hilpert, H. 1992a. Zur Identität von *Stenobarichneumon constantineanui* Heinrich, 1972 und Bemerkungen zu den europäischen Arten des Genus *Rugosculpta* Heinrich, 1967 (Hymenoptera, Ichneumonidae, Ichneumoninae). – Spixiana **15**: 143-148

-- 1992b. Zur Systematik der Gattung *Ichneumon* Linnaeus, 1758 in der Westpalaearktis (Hymenoptera, Ichneumonidae, Ichneumoninae). – Entomofauna, Suppl. **6**: 389 pp.

Hinz, R. 1963. Zur Systematik und Ökologie der Ichneumoniden III (Hym.). – Dt. ent. Z., N. F. **10**: 116-121

-- 1975. Vier Bemerkungen zur Systematik der Ichneumonidae (Hym.). – NachrBl. bayer. Ent. 24: 65-68

-- 1991. Untersuchungen zur Lebensweise von Arten der Ichneumonini (Hymenoptera, Ichneumonidae). – Mitt. Schweiz. ent. Ges. **64**: 109-114

-- & K. Horstmann 2000. Die westpaläarktischen Arten von *Exephanes* Wesmael (Insecta, Hymenoptera, Ichneumonidae, Ichneumoninae). – Spixiana **23**: 15-32

Horstmann, K. 1968. Revision einiger Arten der Gattungen *Mesostenus* Gravenhorst, *Agrothereutes* Foerster und *Ischnus* Gravenhorst (Hymenoptera, Ichneumonidae). – Entomophaga **13**: 121-133

-- 1975. Neubearbeitung der Gattung *Nemeritis* Holmgren (Hymenoptera, Ichneumonidae). – Pol. Pismo Ent. **45**: 251-265

-- 1976. Wenig bekannte oder neue europäische Hemitelinen-Gattungen (Hymenoptera, Ichneumonidae, Cryptinae). –NachrBl. bayer. Ent. **25**: 22-31

-- 1980. Revision der europäischen Arten der Gattung *Rhimphoctona* Förster (Hymenoptera, Ichneumonidae). – NachrBl. bayer. Ent. **29**: 17-24

-- 1981. Die paläarktischen Arten der Gattungen *Eremotylus* Förster, 1869, und *Simophion* Cushman, 1947 (Hymenoptera, Ichneumonidae). – Entomofauna **2**: 415-432

-- 1988. Über einige *Itoplectis*- und *Tromatobia*-Arten von den Kanarischen Inseln (Hymenoptera, Ichneumonidae). – NachrBl. bayer. Ent. **37**: 97-100

-- 1990. Die westpaläarktischen Arten einiger Gattungen der Cryptini (Hymenoptera, Ichneumonidae). – Mitt. Münch. Ent. Ges. **79** (1989): 65-89

-- 1992. Revision einiger Gattungen und Arten der Phygadeuontini (Hymenoptera, Ichneumonidae). – Mitt. Münch. Ent. Ges. **81** (1991): 229-254

-- 1993a. Revision der brachypteren Weibchen der westpaläarktischen Cryptinae (Hymenoptera, Ichneumonidae). – Entomofauna **14**: 85-148

-- 1993b. Revision der von Ferdinand Rudow beschriebenen Ichneumonidae I (Hymenoptera). – Beitr. Ent. **43**: 3-38

-- 1997. Über infrasubspezifische Namen von Formen und Varietäten der Autoren Kriechbaumer, Athimus, Pfankuch, Ulbricht und Hedwig in der Familie Ichneumonidae (Hymenoptera). – Z. Arbeitsgem. Öster. Ent. **49**: 47-56

-- 1998a. Übersicht über die von Sigismund Brauns beschriebenen europäischen Ichneumonidae (Hymenoptera). – NachrBl. bayer. Ent. **47**: 80-87

-- 1998b. Die europäischen Arten von *Megarhyssa* Ashmead, 1900 (Hymenoptera, Ichneumonidae). – Entomofauna **19**: 337-350

-- 1998c. Revisionen einiger Gattungen und Arten der Phygadeuontini II (Hymenoptera, Ichneumonidae, Cryptinae). – Entomofauna **19**: 433-460

-- 1999. Revisionen von Schlupfwespen-Arten III (Hymenoptera: Ichneumonidae). – Mitt. Münch. Ent. Ges. **89**: 47-57

-- 2000a. Typenrevisionen einiger von Habermehl beschriebener Ichneumonidae (Hymenoptera). – NachrBl. bayer. Ent. **49**: 67-70
-- 2000b. Revisionen von Schlupfwespen-Arten IV (Hymenoptera: Ichneumonidae). – Mitt. Münch. Ent. Ges. **90**: 39-50
-- 2000c. Die europäischen Arten von *Probolus* Wesmael, 1845 (Hymenoptera, Ichneumonidae). – Entomofauna **21**: 293-300
-- 2001a. Ichneumonidae. In: Dathe, H. H., A. Taeger & S. M. Blank (Hrsg.), Verzeichnis der Hautflügler Deutschlands (Entomofauna Germanica 4). – Ent. Nachr. Ber. (Dresden), Beiheft **7**: 69-103
-- 2001b. Revisionen von Schlupfwespen-Arten V (Hymenoptera: Ichneumonidae). – Mitt. Münch. Ent. Ges. **91**: 77-86
-- 2001c. Revision der bisher zu *Iselix* Förster gestellten westpaläarktischen Arten von *Phygadeuon* Gravenhorst (Insecta, Hymenoptera, Ichneumonidae, Cryptinae). – Spixiana **24**: 207-229
-- 2002. Revisionen von Schlupfwespen-Arten VI (Hymenoptera: Ichneumonidae). – Mitt. Münch. Ent. Ges. **92**: 79-91
-- 2003. Revisionen von Schlupfwespen-Arten VII (Hymenoptera: Ichneumonidae). – Mitt. Münch. Ent. Ges. **93**: 25-37
-- & S. Bordera 1995. Type revisions of Ichneumonidae (Hymenoptera) described by Kriechbaumer from Mallorca. – NachrBl. bayer. Ent. **44**: 49-55
-- & D. S. Yu 1999. Bemerkungen zur Taxonomie und Nomenklatur westpaläarktischer Ichneumonidae. – Z. Arbeitsgem. Öster. Ent. **50** (1998): 77-84
Idar, M. 1975a. Redescriptions of *Hadrodactylus paludicola* (Hlgr.), *H. femoralis* (Hlgr.) and *H. insignis* (Krb.) (Hymenoptera: Ichneumonidae). – Ent. scand. **6**: 182-190
-- 1975b. Redescriptions of *Hadrodactylus fugax* (Gr.), *H. confusus* (Hlgr.), *H. genalis* Th. and *H. larvatus* (Krb.) (Hymenoptera: Ichneumonidae). – Ent. scand. **6**: 286-296
-- 1983. Revision of European *Synomelix* Förster (Hymenoptera: Ichneumonidae) with description of *S. faciator* n. sp. – Ent. scand. **14**: 168-172
Kasparyan, D. S. 1969. [Palaearctic species of the genus *Tryphon* Fallén (Hymenoptera, Ichneumonidae) I.] [russisch] – Ent. Obozr. **48**: 639-662
-- 1973. [Schlupfwespen – Ichneumoniden (Ichneumonidae), Unterfamilie Tryphoninae, Tribus Tryphonini.] [russisch] – [Fauna der USSR, Insekten, Hautflügler, Band III, Teil 1] [russisch] – Leningrad, 320 pp.
-- 1997. On some species of *Mesoleius* s. l. described by Holmgren and Thomson (Hymenoptera: Ichneumonidae). – Zoosyst. Ross. **6**: 302
-- 1998. Taxonomic notes on the species of *Mesoleius* s. l., *Hyperbatus* and *Phaestus* in the museums of Stockholm, Lund and Munich (Hymenoptera: Ichneumonidae, Ctenopelmatinae). – Zoosyst. Ross. **7**: 181-183
Kerrich, G. J. 1952. A review, and a revision in greater part, of the Cteniscini of the Old World (Hym., Ichneumonidae). – Bull. Br. Mus. Nat. Hist., Ent. **2** (6): 305-459
-- 1966. On the species of *Pseudorhyssa* Merrill (Hym., Ichneumonidae). – Entomologist **99**: 44-46
Kiss, A. 1924. Beiträge zur Kenntnis der ungarischen und siebenbürgischen Ichneumoniden- (Schlupfwespen-) Fauna. – Verh. Mitt. Siebenbürg. Ver. Naturw. Hermannstadt **72/74**: 32-146
Kriechbaumer, J. 1954. Hymenopterologisches. – Ent. Ztg. Stettin **15**: 153-158
-- 1869. Beschreibung einer neuen Schlupfwespe. – Mitt. Schweiz. ent. Ges. **3**: 129-130
-- 1872a. Neue Schlupfwespen aus den Alpen. – Mitt. Schweiz. ent. Ges. **3**: 482-485
-- 1872b. *Atractogaster*, nov. gen. Pimplidarum. – Ent. Ztg. Stettin **33**: 6-10
-- 1873. Hymenopterologische Beiträge. III. – Verh. zool.-bot. Ges. Wien (Abh.) **23**: 49-68
-- 1874. Eine alte und eine neue Art der Gattung *Ichneumon*. – Correspondenzbl. zool.-mineral. Ver. Regensburg **28**: 146-150
-- 1875. Neue Schlupfwespen. – Correspondenzbl. zool.-mineral. Ver. Regensburg **29**: 149-158
-- 1877. *Holmgrenia* eine neue Schlupfwespengattung. – Correspondenzbl. zool.-mineral. Ver. Regensburg **31**: 146-150
-- 1878a. Neue Schlupfwespen aus Ungarn. – Ent. Nachr. **4**: 41-46
-- 1878b. *Bassus ibalioidis* nov. sp. – Ent. Nachr. **4**: 211-212
-- 1878c. Ichneumonologisches. – Ent. Nachr. **4**: 249-252
-- 1879a. Beitrag zur Kenntnis der Schlupfwespen-Gattung *Ischnocerus*. – Correspondenzbl. zool.-mineral. Ver. Regensburg **33**: 163-167
-- 1879b. Ein neuer *Xylonomus* nebst Bemerkung über den *X. securicornis* Hlmg. – Correspondenzbl. zool.-mineral. Ver. Regensburg **33**: 167-169
-- 1879c. *Ophion Pteridis* n. sp. – Ent. Nachr. **5**: 89-90
-- 1879d. *Ophion parvulus* n. sp. – Ent. Nachr. **5**: 104-105
-- 1879e. *Ophion minutus* n. sp. – Ent. Nachr. **5**: 105-106
-- 1880a. *Brachycyrtus* novum genus Cryptidarum. – Correspondenzbl. zool.-mineral. Ver. Regensburg **34**: 161-164
-- 1880b. Gezogene Schlupfwespen aus Dalmatien. – Ent. Nachr. **6**: 73-75
-- 1880c. Neue Schlupfwespen aus den Alpen. – Mitt. Schweiz. ent. Ges. **6**: 12-15
-- 1882a. Ichneumoniden-Studien. – Ent. Nachr. **8**: 122-129, 173-177, 237-243
-- 1882b. Hymenoptera nova vel minus cognita in collectione Musaei Nationalis Hungarici. – Termész. Füzetek **6**: 143-151
-- 1883. Ophioniden-Studien. – Correspondenzbl. naturw. Ver. Regensburg **37**: 97-114
-- 1886. Neue Schlupfwespen. – Ent. Nachr. **12**: 241-246
-- 1887a. Frühjahrsbeschäftigungen für den Insektensammler, besonders den Hymenopterologen. – Ent. Nachr. **13**: 65-67

-- 1887b. Pimpliden-Studien. – Ent. Nachr. **13**: 81-87, 113-121, 245-254
-- 1887c. Neue Ichneumoniden. – Mitt. Schweiz. ent. Ges. **7**: 301-309
-- 1888a. Zur Kenntnis der Gattung *Euceros*. – Ent. Nachr. **14**: 197-200
-- 1888b. Pimpliden-Studien. – Ent. Nachr. **14**: 337-340
-- 1888c. Das ♂ des *Euceros superbus* m. – Ent. Nachr. **14**: 353-354
-- 1888d. *Exetastes alpinus* m. ♀♂. – Ent. Nachr. **14**: 354-355
-- 1888e. Neue Ichneumoniden des Wiener Museums. – Ann. nat.-hist. Hofmus. Wien **3**: 23-36
-- 1889a. Pimpliden-Studien. – Ent. Nachr. **15**: 17-24, 73-78, 140-142, 156-163, 316-318
-- 1889b. Ichneumoniden-Studien. – Ent. Nachr. **15**: 142-144, 201-208
-- 1890a. Ichneumoniden-Studien. Neue Ichneumoniden des Wiener Museums. – Ann. nat.-hist. Hofmus. Wien **5**: 479-491
-- 1890b. Ichneumoniden-Studien. – Ent. Nachr. **16**: 151-155, 181-185, 199-204, 348-351
-- 1890c. Neue Schlupfwespen aus Nord- und Mittel-Deutschland. – Ent. Nachr. **16**: 289-297
-- 1890d. Zwei Neue Tryphoniden-Gattungen. – Mitt. Schweiz. ent. Ges. **8**: 207-210
-- 1890e. Neue Schlupfwespen aus der Schweiz. – Mitt. Schweiz. ent. Ges. **8**: 235-236
-- 1891a. Ichneumoniden-Studien. – Ent. Nachr. **17**: 8-11
-- 1891b. Tryphoniden-Studien. – Ent. Nachr. **17**: 34-46, 133-141, 247-252, 298-303
-- 1891c. Cryptiden-Studien. – Ent. Nachr. **17**: 162-172
-- 1892a. Tryphoniden-Studien. – Ent. Nachr. **18**: 40-43
-- 1892b. Ein neuer *Psilomastax*. – Ent. Nachr. **18**: 101
-- 1892c. Xylonomiden- und Pimpliden-Studien. – Ent. Nachr. **18**: 211-220
-- 1892d. Ophioniden-Studien. – Ent. Nachr. **18**: 232-236
-- 1892e. Ichneumoniden-Studien. – Ent. Nachr. **18**: 292-297
-- 1892f. Cryptiden-Studien. – Ent. Nachr. **18**: 340-352, 362-365, 370-373
-- 1893a. Cryptiden-Studien. – Ent. Nachr. **19**: 54-60, 119-127, 145-153
-- 1893b. Ichneumoniden-Studien. – Ent. Nachr. **19**: 259-265, 325-332, 363-366
-- 1894a. Himénopteros nuevos de Mallorca, recogidos por D. Fernando Moragues. – An. Soc. Hist. nat. Españ. **23**: 239-253
-- 1894b. Ichneumonidae novae e fauna Hungarica Musaei Nationalis Hungarici. – Termész. Füzetek **17**: 48-60
-- 1894c. Hymenoptera ichneumonidea, a medico nautico Dr. Joh. Brauns in itinere ad oras Africae occidentalis lecta. – Berlin. Entomol. Z. **39**: 43-68
-- 1894d. Zwei neue Schlupfwespen-Gattungen. – Ent. Nachr. **20**: 58-61
-- 1894e. Ichneumoniden-Studien. Untersuchung Tischbein'scher Schlupfwespen-Typen. Fortsetzung. – Ent. Nachr. **20**: 162-173, 248-256, 279-288, 315-333, 337-352
-- 1894f. Die Gattung *Tropistes* und eine neue Art derselben. – Ent. Nachr. **20**: 260-262
-- 1895a. Hymenoptera nova exotica Ichneumonidea e collectione Dr. Rich. Kriegeri Lipsiensis. – Sitzungsber. naturf. Ges. Leipzig **1893-1894**: 124-136
-- 1895b. Ichneumoniden-Studien. – Ent. Nachr. **21**: 104-112
-- 1895c. Neue Pimpliden des Berner Museums. – Mitt. Schweiz. ent. Ges. **9**: 260-266
-- 1896a. Ichneumonologia varia. – Ent. Nachr. **22**: 353-372
-- 1896b. Neue oder wenig bekannte Ichneumoniden in der Sammlung des Ung. National-Museums. – Termész. Füzetek **19**: 128-139
-- 1897a. Entomologica varia. – Ent. Nachr. **23**: 119-124, 165-176, 184-192
-- 1897b. Ein Parasit der seltenen *Eupithecia Millierata*. – Ent. Nachr. **23**: 316-317
-- 1897c. *Mesochorus gigas* nov. sp. ♀. – Ent. Nachr. **23**: 332-333
-- 1898a. Ichneumonologica varia. – Ent. Nachr. **24**: 309-314
-- 1898b. Diagnosis de himenópteros nuevos de España. – Acta Soc. Españ. Hist. Nat. Madrid **2**: 168-172
-- 1899. Ichneumonologica varia. Contin. – Ent. Nachr. 25: 66-72, 295-303
-- 1900a. Neue Schlupfwespen. – Ent. Nachr. **26**: 169-175
-- 1900b. *Glypta paleanae* Krchb. nov. sp. – In: Reuter, E., Über die Weißährigkeit der Wiesengräser in Finland. Ein Beitrag zur Kenntnis ihrer Ursachen. – Acta Soc. Fauna Flora Fenn. **19** (1): 121-122
-- 1901. Neue Ichneumoniden (Hym.). – Z. syst. Hymenopt. Dipt. **1**: 252-255
Krieger, R. 1902. Eine schwarze *Theronia*. – Z. syst. Hymenopt. Dipt. **2**: 189-190
Meyer, N. F. 1934. [Tables systématiques des hyménoptères parasites (fam. Ichneumonidae) de l'URSS et des pays limitrophes. Vol. III.] [russisch] – [Tableaux analytiques de la faune de l'URSS, publiés par l'Institut Zoologique de l'Academie des Sciences.] [russisch] – Leningrad, 271 pp.
Mocsáry, A. 1892. Synonymisches. – Ent. Nachr. **18**: 208
Móczár, L. 1968. Über einige Ichneumoniden-Typen des Ungarischen Naturwissenschaftlichen Museums (Hymenoptera). – Ann. hist.-nat. Mus. nat. Hung. **60**: 183-190
Morley, C. 1906. On the ichneumonidous group Tryphonides schizodonti, Holmgr., with descriptions of new species. – Trans. R. Ent. Soc. London **4** (1905): 419-438
Oehlke, J. 1964. Übersicht und Bestimmungstabelle der palaearktischen Gattungen der ehemaligen Unter-

familie Pimplinae auct. (Hymenoptera, Ichneumonidae). – Ent. Abh. staatl. Mus. Tierkunde (Dresden) **29**: 533-590
–– 1966a. Die in europäischen Kiefernbuschhornblattwespen (Diprionidae) parasitierenden Ichneumonidae (Hymenoptera). – Beitr. Ent. **15** (1965): 791-879
–– 1966b. *Apistephialtes* Seyrig ein Synonym zu *Liotryphon* Ashmead (Hymenoptera, Ichneumonidae). – Reichenbachia **6**: 145-146
–– 1966c. Zur Synonymie einiger *Scambus*-Arten. – Beitr. Ent. **16**: 189-191
–– 1967. Westpaläarktische Ichneumonidae 1: Ephialtinae. In: Ferrière, C., & J. van der Vecht (Eds.), Hymenopterorum Catalogus (nova editio), Pars 2. – 's-Gravenhage, VII & 49 pp.
Perkins, J. F. 1940. Notes on the synonymy of some genera of European Pimplinae (s. l.) (Hym. Ichneumonidae). – Entomologist **73**: 54-56
–– 1941. A synopsis of the British Pimplini, with notes on the synonymy of the European species (Hymenoptera, Ichneumonidae). – Trans. R. Ent. Soc. London **91**: 637-659
–– 1943. Preliminary notes on the synonymy of the European species of the *Ephialtes* complex (Hym., Ichneumonidae). – Ann. Mag. Nat. Hist (11) **10**: 249-273
–– 1953. Notes on British Ichneumoninae with descriptions of new species (Hym., Ichneumonidae). – Bull. Br. Mus. Nat. Hist., Ent. **3** (4): 105-176
–– 1959. Hymenoptera. Ichneumonoidea. Ichneumonidae, key to subfamilies and Ichneumoninae – 1. – Handbk. Ident. Br. Insects, Vol. VII, Part 2 (ai): 116 pp.
Pfankuch, K. 1901. *Arctia purpurata* L. und die Schlupfwespe *Erigorgus purpuratae* Kriechb. – Abh. naturw. Ver. Bremen **17**: 153-156
–– 1919. Der äußere Körperbau der echten Schlupfwespen (Ichneumonidae). – Abh. naturw. Ver. Bremen **24**: 25-74
–– 1924. Ichneumonologisches (1. Fortsetzung). Die Typen der Gravenhorst'schen Gattungen *Phytodietus* und *Ischnocerus* (Hym.). – Konowia **3**: 41-51
Rasnitsyn, A. P. 1981. Gravenhorst's and Berthoumieu's types of Ichneumoninae Stenopneusticae preserved in Wroclaw and Cracow, Poland (Hymenoptera, Ichneumonidae). – Pol. Pismo Ent. **51**: 101-145
–– & U. V. Siitan 1981. Podsem. Ichneumoninae. – In: Kasparyan, D. R. (Ed.), [Bestimmungstabellen der Insekten des europäischen Teils der USSR, Band III, Hautflügler, 3. Teil.] [russisch] – Leningrad, pp. 506-36.
Rey del Castillo, C. & P. L. Scaramozzino 1991. Revisión del género paleártico *Odinophora* (Foerster, 1868) (Hymenoptera, Ichneumonidae, Banchinae). – Boll. Mus. reg. Sci. nat. Torino **9**: 247-260
Roman, A. 1909. Ichneumoniden aus dem Sarekgebirge. – in: Hamberg, A. (Ed.), Naturwissenschaftliche Untersuchungen des Sarekgebirges in Schwedisch-Lappland **4**: 199-374
–– 1914. Beiträge zur schwedischen Ichneumonidenfauna. – Ark. Zool. **9** (2): 40 pp.
–– 1931. Entomologische Ergebnisse der schwedischen Kamtschatka-Expedition 1920-1922. 33. Ichneumonidae, Subfamilien Pimplinae und Tryphoninae. – Ark. Zool. **23 A** (6): 32 pp.
Rossem, G. van. 1969. A revision of the genus *Cryptus* Fabricius s. str. in the western Palearctic region, with keys to the genera of Cryptina and species of *Cryptus* (Hymenoptera, Ichneumonidae). – Tijdschr. Ent. **112**: 299-374
–– 1989. The genus *Cryptus* Fabricius, 1804 of the Canary Islands (Hymenoptera, Ichneumonidae). – Tijdschr. Ent. **132**: 251-258
Sawoniewicz, J. 1980. Revision of European species of the genus *Bathythrix* Foerster (Hymenoptera, Ichneumonidae). – Ann. Zool. **35**: 319-365
–– 1984. Revision of some type-specimens of European Ichneumonidae (Hymenoptera). – Ann. Zool. **37**: 313-330
–– 1985. Revision of European species of the subtribe Endaseina (Hymenoptera, Ichneumonidae), I. – Ann. Zool. **39**: 131-146
–– 1986. Revision of some type-specimens of European Ichneumonidae (Hymenoptera), 2. – Ann. Zool. **40**: 371-380
–– 1988. Revision of some type-specimens of European Ichneumonidae (Hymenoptera), 3. – Ann. Zool. **41**: 481-490
–– 1989. Revision of some type-specimens of European Ichneumonidae (Hymenoptera), 4. – Ann. Zool. **42**: 215-224
–– 1993. Untersuchungen zur Systematik der europäischen Aptesini-Arten (Hymenoptera, Ichneumonidae). – Entomofauna **14**: 13-32
–– 1999. Development dynamics of Ichneumonidae (Hymenoptera) communities of *Pinus sylvestris* L. canopies in fresh pine forest in the three health zones of Poland's forests. – Warszawa, 152 pp.
–– 2003. Zur Systematik und Faunistik europäischer Ichneumonidae II (Hymenoptera, Ichneumonidae). – Entomofauna **24**: 209-227
Schletterer, A. 1894. Zur Hymenopteren-Fauna Istriens. – Programm k. k. Staatsgymnasium Pola **4**: 3-36
–– 1895. Zur Bienen-Fauna des südlichen Istriens. – Programm k. k. Staatsgymnasium Pola **5**: 3-42
Schmiedeknecht, O. 1888. Monographische Bearbeitung der Gattung *Pimpla*. – Zool. Jahrb., Syt. **3**: 445-542
–– 1900. Die paläarktischen Gattungen und Arten der Ichneumonidentribus der Lissonotinen. – Zool. Jahrb., Syst. **13**: 299-398
–– 1903. Die Ichneumonidentribus der Anomalinen (Hym.). Eine Uebersicht sämmtlicher Gattungen sowie der paläarktischen Arten. – Z. syst. Hymenopt. Dipt. **3**: 1-8
–– 1911-1927. Opuscula Ichneumonologica. V. Band. Tryphoninae. – Blankenburg i. Thür., pp. 2275-3570
–– 1929. Opuscula Ichneumonologica. Supplement-Band I, Fasc. 6. – Blankenburg i. Thür., pp. 353-432
–– 1934. Opuscula Ichneumonologica. Supplement, Genus *Pimpla* F., Fasc. 19-20. – Blankenburg i. Thür., pp. 23-150

Schnee, H. 1986. Zur Kenntnis der Biologie einiger *Erigorgus*-Arten (Hym., Ichneumonidae). – Ent. Nachr. Ber. **30**: 280-281

–– 1989. Revision der von Gravenhorst beschriebenen und redeskribierten Anomaloninae mit Beschreibung zweier neuer Arten (Hymenoptera, Ichneumonidae). – Dt. ent. Z., N. F. **36**: 241-266

–– 1991. Zur Kenntnis der Phänologie und der Wirtsspektren einiger paläarktischer Anomaloninae (Hymenoptera, Ichneumonidae). – Verh. XII. Int. Symp. Entomofaunistik Mitteleuropa (Kiev 1988): 80-85

Schulz, W. A. 1906. Spolia Hymenopterologica. – Paderborn, I & 356 pp.

Schwarz, M. 1988. Die europäischen Arten der Gattung *Idiolispa* Foerster (Ichneumonidae, Hymenoptera). – Linzer biol. Beitr. **20**: 37-66

–– 1995. Revision der westpaläarktischen Gattungen *Gelis* Thunberg mit apteren Weibchen und *Thaumatogelis* Schmiedeknecht (Hymenoptera, Ichneumonidae). Teil 1. – Linzer biol. Beitr. **27**: 5-105

–– 2003. Schlupfwespen (Insecta, Hymenoptera, Ichneumonidae) in den Hochlagen der Hohen Tauern (Österreich). Teil 2: Bemerkungen zu ausgewählten Arten einschließlich der Beschreibung neuer Arten. – Linzer biol. Beitr. **35**: 1097-1118

–– & M. R. Shaw 1998. Western Palaearctic Cryptinae (Hymenoptera: Ichneumonidae) in the National Museums of Scotland, with nomenclatural changes, taxonomic notes, rearing records and special reference to the British check list. Part 1. Tribe Cryptini. – Entomol. Gaz. **49**: 101-127

Schwenke, W. 1999. Revision der europäischen Mesochorinae (Hymenoptera, Ichneumonidae). – Spixiana, Suppl. **26**: 124 pp.

Šedivý, J. 1969. Bemerkungen zu einigen Polysphinctinen-Typen (Hymenoptera, Ichneumonidae). – Acta ent. Mus. Nat. Pragae **38**: 73-79

Seyrig, A. 1932. Observations sur les Ichneumonides (3e série). – Ann. Soc. ent. Fr. **101**: 111-126

Shaumar, N. 1966. Les Ichneumonides d'Égypte. – Entomophaga **11**: 441-469

Shaw, M. R., D. R. Kasparyan & M. G. Fitton 2003. Revision of the British checklist of Ctenopelmatini (Hymenoptera: Ichneumonidae, Ctenopelmatinae). – Entomol. Gaz. **54**: 137-141

Strobl, G. 1902. Ichneumoniden Steiermarks (und der Nachbarländer). III. Fam. Pimplariae. – Mitt. naturw. Ver. Steiermark (Graz) **38** (1901): 3-48

–– 1903. Ichneumoniden Steiermarks (und der Nachbarländer). IV. Fam. Tryphonidae. – Mitt. naturw. Ver. Steiermark (Graz) **39** (1902): 3-100

Szépligeti, V. 1905. Hymenoptera, Fam. Ichneumonidae (Gruppe Ophionoidea), Subfam. Pharsaliinae – Porizontinae. – Genera Insectorum (Bruxelles), Fasc. **34**: 71 pp.

Teunissen, H. G. M. 1948. Naamlijst van Inlandse Sluipwespen (Fam. Ichneumonidae I). – Tijdschr. Ent. **89** (1946): 10-38

Tolkanitz, V. I. 1981. [Ichneumonidi – Phytodietini.] [russisch] – Fauna Ukraini (Kiyev), Tom **11** (1): 148 pp.

Townes, H. 1957. A review of the generic names proposed for old world ichneumonids, the types of whose genotypes are in Japan, Formosa, or North America (Hymenoptera, Ichneumonidae). – Proc. Ent. Soc. Washington **59**: 100-120

–– 1961. Some ichneumonid types in European museums that were described from no locality or from incorrect localities (Hymenoptera). – Proc. Ent. Soc. Washington **63**: 165-178

–– 1969. The genera of Ichneumonidae, part 1. – Mem. Am. Ent. Inst. **11**: II & 300 pp.

–– 1970. The genera of Ichneumonidae, part 3. – Mem. Am. Ent. Inst. **13**: II & 307 pp.

––, S. Momoi & M. Townes 1965. A catalogue and reclassification of the Eastern Palearctic Ichneumonidae. – Mem. Am. Ent. Inst. **5**: V & 661 pp.

–– & M. Townes. 1960. Ichneumon-flies of America North of Mexico: 2. Subfamilies Ephialtinae, Xoridinae, Acaenitinae. – Bull. U. S. Nat. Mus. **216** (2): VII & 676 pp.

––, –– & V. K. Gupta. 1961. A catalogue and reclassification of the Indo-Australian Ichneumonidae. – Mem. Am. Ent. Inst. **1**: IV & 522 pp.

Viktorov, G. A. & A. Z. Atanasov 1974. [Materials on the revision of Palaearctic ichneumonids of the tribe Theriini (Hymenoptera, Ichneumonidae).] [russisch] – Ent. Obozr. **53**: 374-381

Villemant, C. 1982. Les Ichneumonides de Camargue: Prémières conclusions sur leur importance économique. – Nouv. Rev. Ent. **7**: 255-275

Weidner, H. 1972. Die Entomologischen Sammlungen des Zoologischen Instituts und Zoologischen Museums der Universität Hamburg. VIII. Teil. Insecta V. – Mitt. Hamburg. Zool. Mus. Inst. **68**: 107-134

Yu, D. S. & K. Horstmann 1997. A catalogue of World Ichneumonidae (Hymenoptera). – Mem. Am. Ent. Inst. **58** (1-2): VI & 1558 pp.

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Revision der Gattung *Amarygmus* Dalman, 1823 sowie verwandter Gattungen. XXXVII. Nachbeschreibungen und Abbildungen australischer *Amarygmus*-Arten, die von Blackburn beschriebenen wurden

(Insecta, Coleoptera, Tenebrionidae, Amarygmini)

Hans J. Bremer

Bremer, H. J. (2006): Revision of the genus *Amarygmus* Dalman, 1893 and allied genera. XXXVII. Redescription and illustration of Australian species of *Amarygmus* described by Blackburn (Insecta, Coleoptera, Tenebrionidae, Amarygmini). – Spixiana **29/1:** 31-50

The types of the following taxa described as *Amarygmus* Dalman, 1823 have been examined: *Amarygmus aeger* Blackburn, 1893, *Amarygmus diaperioides* Blackburn, 1888, *Amarygmus lilliputanus* Blackburn, 1893, *Amarygmus lindensis* Blackburn, 1893, *Amarygmus pectoralis* Blackburn, 1893, *Amarygmus pinguis* Blackburn, 1893, *Amarygmus porosus* Blackburn, 1893, *Amarygmus queenslandicus* Blackburn, 1893, *Amarygmus rimosus* Blackburn, 1893, *Amarygmus ruficornis* Blackburn, 1893, *Amarygmus rugaticollis* Blackburn, 1893, and *Amarygmus stolidus* Blackburn, 1893.

The following conclusions and taxonomic changes have to be noted: *Amarygmus lindensis* Blackburn, 1893 is a junior synonym of *Amarygmus stolidus* Blackburn, 1893 [syn. nov.]. *Amarygmus queenslandicus* Blackburn, 1893 and *Amarygmus pinguis* Backburn, 1893 are junior synonyms of *Amarygmus diaperioides* Blackburn, 1888 [syn. nov.]; additionally the synonymy with *Amarygmus perplexus* Blackburn, 1893 stated by Carter is confirmed. *Amarygmus regius* Carter, 1914 is a junior synonym of *Amarygmus porosus* Blackburn, 1893. *Amarygmus suavis* Blackburn, 1893 is a junior synonym of *Amarygmus cupido* Pascoe, 1869.

The still valid taxa are redescribed and illustrated.

Prof. (em.) Dr. H. J. Bremer, Osning Str. 9, D-49326 Wellingholzhausen, Germany

Einleitung

Die Mehrzahl der australischen *Amarygmus*-Arten wurde durch Fabricius, Hope, Pascoe, Blackburn und Carter beschrieben. Auf Grund der zum Teil dürftigen Beschreibungen ohne Abbildungen ließen sich in der Vergangenheit die meisten der australischen Arten nicht bestimmen. Ich hatte deshalb begonnen, Nachbeschreibungen mit Abbildungen dieser Arten anzufertigen und in einer vorausgehenden Arbeit solche der von Fabricius, Hope und Pascoe beschriebenen Arten (Bremer 2005) sowie von *Amarygmus striatus* Macleay, 1872 (Bremer 2004) publiziert. Diese Arbeit enthält Nachbeschreibungen und Abbildungen der Arten, die von Blackburn beschrieben wurden.

Eine weitere Arbeit wird Nachbeschreibungen mit Abbildungen der zahlreichen Arten enthalten, die von Carter (1913, 1914, 1917, 1919, 1921, 1932) beschrieben wurden, und der Arten, die Arrow (in Waterhouse et al., 1900, von der Christmas Island), Lea (1910) und Kulzer (1954) (aus Australien) publizierten. Danach werde ich eine Bestimmungstabelle der australischen *Amarygmus*-Arten entwerfen.

Durch Blackburn wurden folgende Arten beschrieben: *Anarygmus aeger* Blackburn, 1893, *A. diaperioides* Blackburn, 1888, *A. lilliputanus* Blackburn, 1893, *A. lindensis* Blackburn, 1893, *A. pectoralis* Blackburn, 1893, *A. perplexus* Blackburn, 1893, *A. pinguis* Blackburn, 1893, *A. porosus* Blackburn, 1893, *A. queenslandicus* Blackburn, 1893, *A. rimosus* Blackburn, 1893, *A. ruficornis* Blackburn, 1893, *A. stolidus* Blackburn, 1893 und *A. suavis* Blackburn, 1893.

A. perplexus Blackburn, 1893 wurde bereits früher mit *A. queenslandicus* Blackburn, 1893 synonymisiert (Carter 1914: 237). In dieser Arbeit werden weitere Synonyme bekannt gegeben.

Die Orginalbeschreibungen von Blackburn wurden in einer vorhergehenden Arbeit zitiert (Bremer 2001b).

Methodik

Die Messungen wurden mit einer im Okular eingravierten Graduierung nach Eichung des Mikroskopes vorgenommen. Als Körperlänge gebe ich den Abstand zwischen Vorderrand des Halsschildes und Ende der Flügeldecken an; Breite bezieht sich auf die breiteste Stelle der Flügeldecken; Flügeldeckenlänge auf den Abstand des Vorderrandes vom Scutellum und Enden der Flügeldecken; die Halsschildlänge wurde median zwischen Vorder- und Hinterrand gemessen.

Abkürzungen

CBj	Sammlung von Herrn Vr. R. Bejšák-Collorado-Mansfeld, Sydney
CG	Sammlung von Herrn Dr. Roland Grimm, Tübingen
MNHP	Muséum National d'Histoire Naturelle, Paris
NHM	National History Museum, London
SAM	South Australian Museum, Adelaide
ZSM	Zoologische Staatssammlung, München
ZSMB	Sammlung des Verfassers (jetzt im Besitz der Zoologischen Staatssammlung München).

Danksagung

Ich danke besonders den Herren M. V. L. Barclay, London, und Dr. E. Matthews, Adelaide, daß sie mir die Typen von Blackburn zur Untersuchung zugänglich machten. Außerdem danke ich den Herren Dr. M. Baehr, München, S. Bečvář, České Budějovice und Vr. R. Bejšák-Collorado-Mansfeld, Sydney, für das Ausleihen von Material, das in diese Publikation eingearbeitet wurde. Die Zeichnungen wurden von Herrn Frank Forman, Stemwede, angefertigt, wofür ich herzlich danke.

Nachbeschreibungen

Die Typen der Blackburnschen *Amarygmus*-Arten sind im National History Museum, London, und im South Australian Museum, Adelaide, deponiert. Ich konnte die Typen aller Arten untersuchen. Soweit notwendig habe ich Lectotypen festgelegt. Dieses erfolgte insbesondere dann, wenn mehrere Syntypen vorhanden waren, und ich Zweifel hatte, ob Verwechslungen mit nahestehenden Arten vorkommen könnten bzw. ich mir nicht sicher war, daß alle Syntypen zu demselben Taxon gehören.

Amarygmus aeger Blackburn, 1893
Abb. 1A-H

Amarygmus aeger Blackburn, 1893: 94.

Typen. 4 als Cotypen bezeichnete Syntypen aus dem SAM: 1. Syntype: ♂, Tar Reefs, N.S.W.; (handschriftlich) *Amarygmus aeger* Blackb. c-Type (Lectotypus); 2. Syntype: ♂, Braidwood, N.S.W., 1.2.92, Lea; (handschriftlich) *Amarygmus aeger* Blackb. (Paralectotypus); 3. Syntype: ♀, 4722, Queensland, Blackburn Coll. 46; (handschriftlich) *Amarygmus aeger* Blackb., Co-Type; 4. Syntype (Geschlecht nicht erkennbar, weil Beine fehlen): N.S. Wales, Co-Type; (handschriftlich) *Amarygmus aeger* Blackb.

Diagnose. Lang gestreckte Flügeldecken mit geraden Seiten; Halsschild kurz und schmal, mit verrundeten Vorderecken; breite Stirn; Flügeldecken mit Punktreihen und deutlich punktierten Interstitien; Farbe der Flügeldecken grüngelb, violett bis blau.

Es gibt ein zweites, sehr ähnliches Taxon (unbeschrieben?), zu dem wahrscheinlich der 3. Syntypus (siehe oben) gehört und das ich aus Brisbane in meiner Sammlung habe. Dieses ist etwas kleiner und besitzt eine etwas schmalere Stirn. Eine Bewertung dieses Taxon kann ich erst vornehmen, wenn ich alle bisher beschriebenen australischen Arten kenne.

Nachbeschreibung

Maße. Länge: 10,8-12,5 mm. Breite: 5,0-5,1 mm. Relationen. Halsschild: Breite/Länge 1,62-1,65; Breite Hinterecken/Breite Vorderecken 1,51-1,56. Flügeldecken: Länge/Breite 1,75-1,83; Länge Flügeldecken/Länge Halsschild 4,23-4,42; maximale Breite Flügeldecken/maximale Breite Halsschild 1,46-1,49.

Farbe. Flügeldecken deutlich mikroretikuliert, leicht chagriniert, mit fettigem Glanz; die ersten Interstitien leicht grün, die laterad folgenden gelblich, dunkelviolett, dann wieder gelbgrün. Halsschild schwarzgrün, leicht mikroretikuliert, mäßiggradig glänzend. Stirn schwarzbraun bis schwarz. Unter-

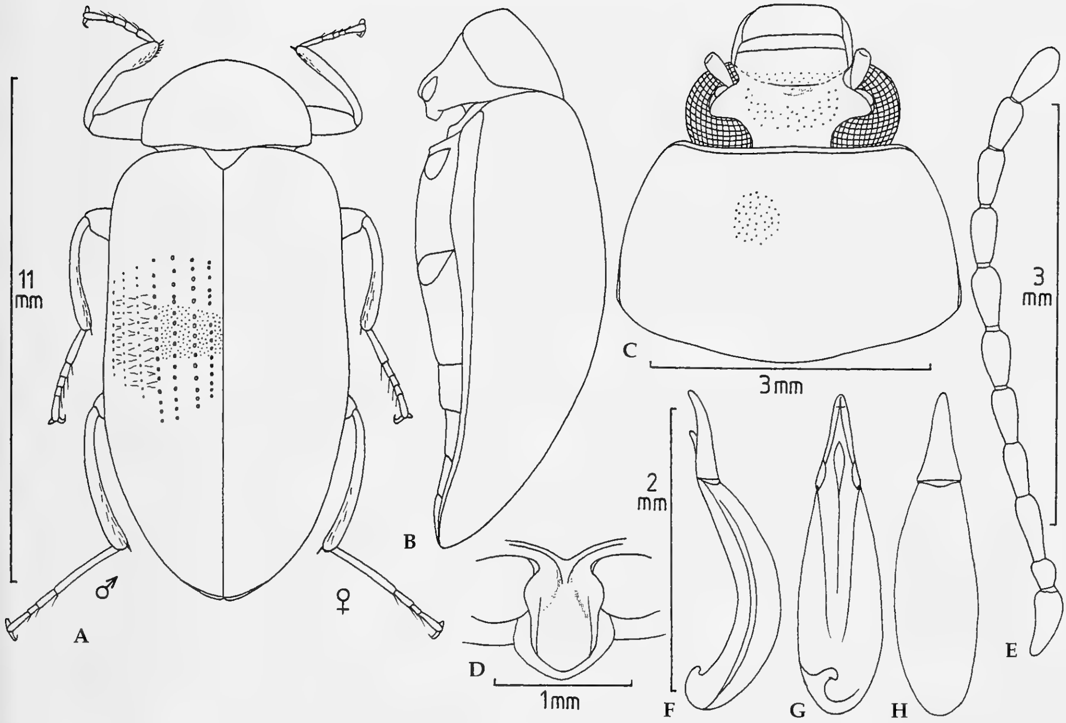

Abb. 1. *Amarygmus aeger* Blackburn, 1893. **A.** Habitus, linksseitig Beine eines ♂, rechtsseitig Beine eines ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

seite schwarz, glänzend (auch Sternite!). Femora, Tibiae schwarz, glänzend.

Kopf. Stirn breit, etwa so breit wie die gemeinsamen Längen der 2. und 3. Antennomeren. Wangen sehr gering aufgebogen und kaum von der Stirn abgegrenzt. Stirnnaht nur median eingedrückt und etwas eingeschnitten. Clypeus vorgezogen, längs etwas gewölbt; mit feinen, nicht sehr dicht stehenden Punkten. Punkte der Stirn deutlich weitläufiger als die des Clypeus. Mandibeln bifid.

Halsschild. Schmal, querüber gewölbt; längs nur sehr gering gewölbt; Seiten verengen sich nur wenig nach vorne (Form annähernd halbzylindrisch). Vorderecken breit verrundet. Vorderrand gerade. Seiten durchgehend gerandet, Randung des Vorderrandes in der Mitte etwas abgeschwächt. Bei Ansicht von oben sind die Seitenrandungen nur hinten sehr schmal sichtbar. Bei Ansicht von der Seite haben die Vorderecken einen Winkel von etwa 100°, die Hinterecken sind stumpfwinkliger. Oberseite mit kleinen, nicht sehr dicht und unregelmäßig stehenden Punkten, die median eine punktfreie Fläche frei lassen.

Flügeldecken. Sehr lang gestreckt; Seiten annähernd gerade; etwas verbreitert bis zum Beginn des hinteren Drittels. Quer deutlich gewölbt, längs leicht gewölbt. Größte Höhe etwas vor der Mitte. Schulterbeulen vorhanden. Enden der Flügeldecken gemeinsam verrundet. Bei Ansicht von oben sind die Seitenrandkanten unsichtbar. Auf der Oberseite Punktreihen mittelgroßer Punkte, die inkonstant durch feine Striche miteinander verbunden sind, etwa 37 Punkte in der 4. Reihe. Interstitien flach; mit feinen, etwas verwaschenen, ziemlich dicht stehenden Punkten.

Prosternum. Vorderrand aufgebogen, median zur Apophyse hin eingezogen, einen ziemlich langen, schmalen Kiel in die Apophyse hinein sendend. Apophyse von mittlerer Breite; Seitenränder neben den Procoxae verdickt, kurz deutlich verbreitert und ventrad angehoben (besitzen eine ohrenförmige Gestalt); dazwischen median deutlich gefurcht (aber in der Mitte durch den schmalen, vom Vorderrand ausgehenden Kiel angehoben); hinter den Hüften horizontal kaudad vorgezogen, mit etwas angehobenen, subparallelen Seitenrändern; apikal breit zugespitzt; mediane Fläche hinter den Hüften querüber etwas gewölbt, mit einigen winzigen Härchen.

Mesosternum. Vorderrand des hinteren Teils breit ausgeschnittenen. Seitenränder etwas angehoben.

Metasternum. Vorderrand zwischen den Mesocoxae breit gerandet. Scheibe etwas angehoben und querüber gewölbt; vorne mit einigen kleinen Punkten, hinten mit nicht sehr dicht stehenden, feinen Punkten. Medianlinie in der hinteren Hälfte inkonstant eingedrückt. Scheibe auch bei ♂♂ mit so winzigen Härchen, daß sie wie kahl erscheint.

Sternite. Seitenränder der Apophyse zwischen den Metacoxae annähernd gerade, gerandet, vorne spitzwinklig. Alle Sternite mit weitläufig stehenden, winzigen Punkten. Analsternit apikomedian bei ♂♂ flach eingedrückt.

Fühler. Nicht sehr lang. 11. Antennomer apikal verrundet. Die Längen und Breiten der Antennomeren 1-12 verhalten sich wie 10:5 / 6:4 / 13:4,5 / 9:4,5 / 9:4,5 / 10:5 / 11:5,5 / 10:5,5 / 10:5,5 / 9:5,5 / 12:5,5.

Beine. Nicht sehr lang. Femora zu den zweiten Dritteln hin etwas keulenförmig aufgetrieben. Protibiae bei ♂♂ außen gekrümmt, innen in den apikalen 40 % plötzlich verbreitert, bei ♀♀ insgesamt leicht gekrümmt, ohne diese Verbreiterungen der Innenseiten. Mesotibiae bei ♂♂ außen gekrümmt, an den Innenseiten in den apikalen 40 % nur sehr leicht verbreitert; bei ♀♀ außen leicht gekrümmt, innen in den apikalen 60% annähernd gerade. Metatibiae bei beiden Geschlechtern schmal, etwas kompreß, gebogen. Die Protarsomeren 1-3 sind bei ♂♂ nicht verbreitert. Die 1. Pro- und Mesotarsomeren sind bei beiden Geschlechtern auffallend lang. Die Längen der Protarsomeren 1-5 sind 10:5,5:4,5:4:14, die der Mesotarsomeren 1-5 sind 17:7,5:6:4:14. die der Metatarsomeren 1-4 sind 31:10:5:14.

Material. S. Australis, D. Schneider (1♀ ZSM).

Amarygmus diaperioides Blackburn, 1888
(Abb. 2A-I)

Amarygmus diaperioides Blackburn, 1888: 1435.
Amarygmus perplexus Blackburn, 1893: 102-103; [syn. von *queenslandicus*]: Carter 1914: 237.
Amarygmus pinguis Blackburn, 1893: 102 [**syn. nov.**].
Amarygmus queenslandicus Blackburn, 1893: 101-102 [**syn. nov.**].

Typen. *Amarygmus diaperioides* Blackburn, 1888. Es existieren im SAM 4 Syntypen von *diaperioides*, zwei von ihnen aufgeklebt auf einem Plättchen (eines davon ohne Kopf und Halsschild), etikettiert:

1. Etikett, (gedruckt) N. Territory; 2. Etikett, (handschriftlich, Blackburns Handschrift) *Amarygmus diaperioides* Blackburn; 3. Etikett, J.10096, *Amarygmus diaperoides* Bl., N. Territory und (rote Tinte) Cotype; 4. Etikett (gedruckt, oranges Papier) Aust. Museum specimen. – 2 weitere Syntypen, an einer kurzen Nadel, nur mit dem gedruckten Etikett (in derselben Weise wie bei den beiden anderen Syntypen) N. Territory. Die Geschlechter der Syntypen habe ich nicht untersucht.

Holotypus von *queenslandicus* Blackburn, 1893: wahrscheinlich ♀, NHM, etikettiert: (rundes Etikett mit rotem Rand) Type; (viereckiges Etikett, handschriftlich) 4745T, N.Qu.T.; (handschriftlich) *Amarygmus queenslandicus* Blackburn; Blackburn coll. 1910-236; British Museum Loan No 16607.

Holotypus von *perplexus* Blackburn, 1893, ♂, NHM, etikettiert: (rundes Etikett mit rotem Rand) Type; (viereckiges Etikett, handschriftlich) 4745T; (handschriftlich) *Amarygmus perplexus* Blackb.; Blackburn coll. 1910-236. Syntypen von *perplexus* in SAM, die ich nicht gesehen habe.

Holotypus von *pinguis* Blackburn, 1893: ♀, NHM, etikettiert: (rundes Etikett mit rotem Rand) Type; viereckiges Etikett, rote Tinte. handschriftlich) 4746, N.Qu., T; (viereckiges Etikett, handschriftlich) *Amarygmus pinguis*, Blackb.; (gedruckt) Blackburn coll. 1910-236; (viereckiges Etikett, Carter's Handschrift) *pinguis* only a small *queenslandicus* Bl., H. J. Carter det.

Ich habe die Typen von *queenslandicus* und *perplexus* im NHM gesehen und kann bestätigen, daß beide Taxa synonym sind. Ebenfalls konnte ich die Type von *pinguis* Blackburn genauer untersuchen; die unpublizierte Feststellung der Synonymie durch Carter kann ich bestätigen.

Diagnose. Klein bis mittelgroß. Länglich oval. Flügeldecken mit eingeschnittenen Striae und gewölbten, gering punktierten Interstitien. Oberseite stark mikroretikuliert und dadurch herabgesetzter Glanz. Halsschild schwarz. Flügeldecken meist dunkelblau. Mittelbreite Stirn. Mittellange Fühler. Protibiae bei ♂♂ apikal nicht plötzlich verbreitert. Vorderteil der Parameren mit subparallelen Seiten. Sehr variabel hinsichtlich Größe, was wahrscheinlich die Synonyme dieser Art wenigstens teilweise erklärt.

Nachbeschreibung

Maße. Länge: 4,94-7,56 mm. Breite: 2,79-4,42 mm. Relationen. Halsschild: Breite/Länge 1,64-1,81; Breite Hinterecken/Breite Vorderecken 1,65-1,81. Flügeldecken: Länge/Breite 1,41-1,48; Länge Flügeldecken/Länge Halsschild 3,38-3,76; maximale Breite Flügeldecken/maximale Breite Halsschild 1,44-1,51.

Farbe. Oberseite stark mikroretikuliert, fettig glänzend. Kopf und Halsschild schwarz, manchmal auch mit leicht bläulichem Farbton. Flügeldecken meist dunkelblau, seltener schwarz, gelegentlich mit leicht irisierenden, queren Streifen. Unterseite schwarzbraun. Beine schwarz, Tarsen braun. Fühler schwarz.

Kopf. Stirn etwas schmaler als die Länge des 3. Antennomers (wie 23:25), dicht, klein punktiert; vorne entspringen aus den Punkten sehr kleine

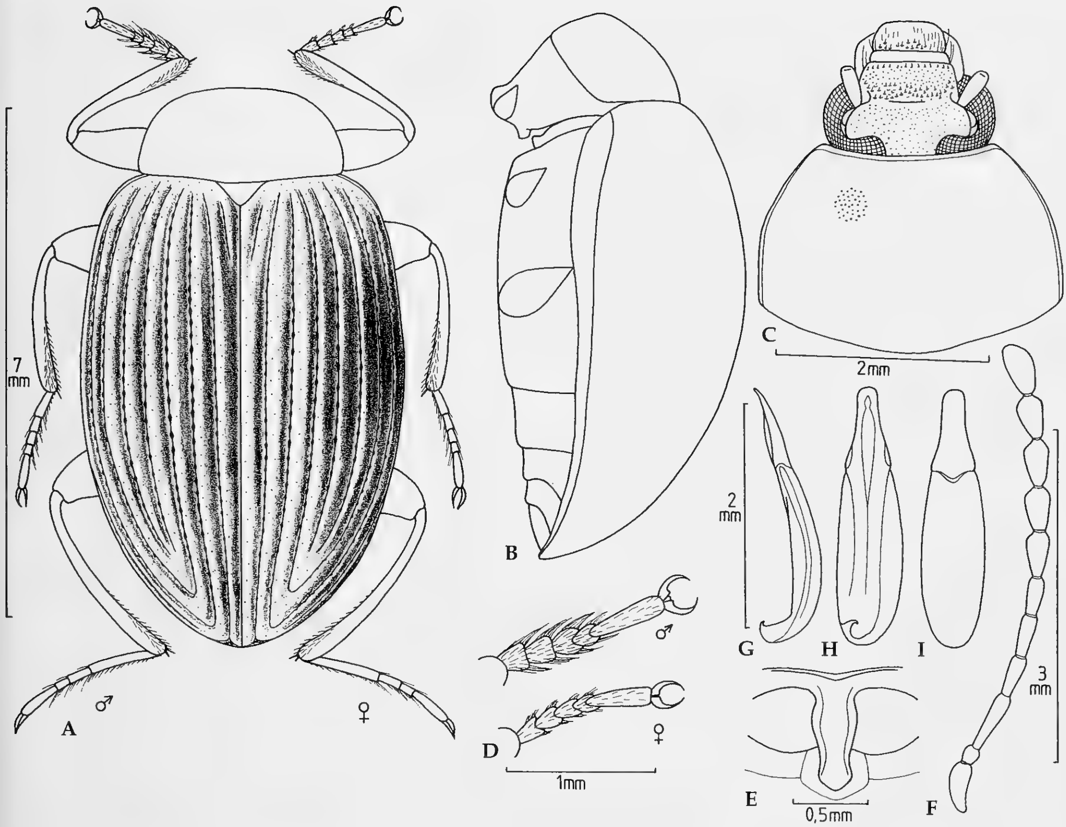

Abb. 2. *Amarygmus diaperoides* Blackburn, 1888. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Protarsomeren ♂ und ♀. **E.** Prosternalapophyse. **F.** Fühler. **G.** Aedoeagus seitlich. **H.** Aedoeagus ventral. **I.** Aedoeagus dorsal.

Härchen. Wangen gewölbt, geringer punktiert als Stirn. Stirnnaht median als breiter, glänzender Strich deutlich sichtbar; kleiner Winkel zwischen Stirn und Clypeus. Clypeus nicht sehr stark vorgezogen, breit, längs und quer etwas gewölbt; ähnlich dicht wie die Stirn punktiert, ebenso mit kurzen Härchen. Mentum mit leicht verrundeten Seitenrändern, die Seiten des Mentum sind plan, glänzend, dazwischen median etwas gewölbt, leicht glänzend. Unterseite des Halses mit sehr dicht stehenden, mittelgroßen Punkten, die Ausgangspunkte für kurze Haare sind. Mandibeln außen gefurcht, bifid.

Halsschild. Verglichen mit den Flügeldecken relativ schmal. Quer gleichmäßig gewölbt, längs leicht gewölbt. Seitenränder in der hinteren Hälfte subparallel; in der vorderen Hälfte verrundet verengt. Vorderrand etwas ausgeschnitten. Vorderecken erscheinen bei Blick von oben schmal verrundet. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten nur in der hinteren Hälfte schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken – angedeutet vorrundet – stumpfwinklig, die Hinterecken mehr eckig und stumpfwinklig. Oberseite mit dicht, unregelmäßig stehenden, kleinen Punkten.

Scutellum. Dreieckig, kaum punktiert.

Flügeldecken. Länglich oval. Quer und längs gewölbt. Größte Breite und Höhe etwa in der Mitte. Schulterbeulen etwas entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur am Apex sichtbar. Oberseite mit deutlich eingeschnittenen Striae; Punkte in den Striae klein, länglich, nicht kerbend, schwierig abzugrenzen; etwa 40 Punkte in dem 4. Streif. Interstitien einschließlich des Apexbereiches deutlich gewölbt; mit feinen bis winzigen Punkten, von denen winzige Härchen ausgehen, die man am besten bei 50-facher Vergrößerung im Apexbereich sieht.

Prosternum. Vorderrand durchgehend schmal aufgebogen, nur sehr leicht median zur Apophyse hin eingezogen. Apophyse schmal, lang gestreckt, hinter den Hüften etwas herabgebogen, aber weit kaudad vorgezogen; neben den Hüften gering verbreitert, dort Seitenränder nur leicht ventrad angehoben, median mit seichter Furche; hinter den Hüften Seitenränder schmal angehoben, parallelseitig; apikal verrundet, hinter den Hüften Oberfläche mikroretikuliert, mit einigen kleinen, aufrecht stehenden Haaren.

Mesosternum. Hinterer Teil oben glatt, mit einigen ungerichtet stehenden, zarten Haaren; vorne median leicht ausgeschnitten.

Metasternum. Vorderrand zwischen den Mesocoxae verrundet; Randung breit und angehoben. Scheibe nur mit winzigen Punkten, aus denen zarte, anliegende, kurze Härchen entspringen. Mittellinie in den hinteren 60 % breit eingedrückt.

Sternite. Vorderrand des 1. Sternits zwischen den Metacoxae schmal spitzbogig, deutlich gerandet. Scheiben mit winzigen, schütter stehenden Pünktchen, mit ähnlich kurzen Härchen wie auf dem Metasternum. Analsternit apikomedian bei ♂♂ etwas eingedrückt.

Fühler. Zurückgelegt annähernd die Mitte der Flügeldecken erreichend. 11. Antennomer apikal verrundet. Die Fühler der ♂♂ sind gering länger als die der ♀♀. Die Längen und Breiten der Antennomeren 1-11 bei einem ♂ verhalten sich wie 17:9 / 9:7,5 / 24:7,5 / 16:7,5 / 18:7,5 / 17:8 / 19:10 / 19:11 / 19:11 / 18:11 / 22:11.

Beine. Nicht sehr lang. Femora zu den zweiten Dritteln hin keulenförmig aufgetrieben; mit sehr kurzen, anliegenden, schütter stehenden Härchen. Protibiae außen annähernd gerade; innen apikad leicht verdickt, apikal innen bei ♂♂ mit einem kleinen Feld anliegender Haare. Mesotibiae sehr leicht gekrümmt; bei ♂♂ apikal innen mit einem kleinen Feld dicht stehender, fast anliegender Haare, abstehende Borsten in den apikalen 40 %. Metatibiae gleichmäßig gekrümmt, wenn auch nicht sehr stark. Protarsomeren bei ♂♂ nicht verbreitert. Die Längen der Protarsomeren sind 8:8:8:7:26, die der Mesotarsomeren 1-5 sind 14:12:9:7:26, die der Metatarsomeren 1-4 sind 38:15:9:26.

Material. Bathurst Isl., Oct. 1916, N. T., G. F. Hill (1 SAM); Groote Eyland, N. B. Tindale (4 SAM); Stapleton, N. T., *A. diaperoides* Bl., Id. by H. J. Carter (3 SAM); N. Queensland, Blackb.'s Coll., *Amarygmus diaperoides* Blackb., HJC det. (1 SAM); G. F. Hill, 30 km E. Darwin, N. T. (2 SAM); Australie, Cooktown (1 ♀ MNHP); Australia, Qld. 93/1, Cape York, 19.-20.5.1993, M. Baehr (4♂♂ ZSM, 3♂♂ CG, 1 ♀ ZSM, 1♀ CG); Australia, Qld. 93/23, Mary Cr., 25 km SE Musgrave, 29.5.1993, M. Baehr (1♂, 1♀ ZSM); Australia, Qld. 93/28, Mary Cr., 25 km SE Laura, 29.5.1993, M. Baehr (1♂ CG); Australia, Qld. 93/46, Mitchell R., 10 km S. Hwy, 5.-6,6.1993, M. Baehr (1♂ ZSM, 2♂♂ CG, 2♀♀ ZSM, 1♀ CG); Cape York, Fetting (1♀ ZSM); N. Holl., C. York, Daniel (1♀ ZSM); Rockhampt., Godefr. (1♀ ZSM); Queensland (2♀♀ ZSM); Australie (1♀ MNHP); Nouvelle Guinée (1♂ MNHP). Nach Gebien (1920) kommt diese Art auch auf den Inseln der Torres-Straße vor.

Amarygmus lilliputanus Blackburn, 1893
Abb. 3A-H

Amarygmus lilliputanus Blackburn, 1893: 100.

Typen. 1. Syntypus: NHM, etikettiert: (auf dem Plättchen, auf den der Syntypus geklebt ist, der handschriftliche Vermerk) 4732T, Qu.; (weißes Etikett, handschriftlich) *Amarygmus lilliputanus* Blackb., (gedruckt) Blackburn Coll. 1910-236. – 2 Syntypen, die ich nicht gesehen habe, im SAM.

Diagnose. Sehr klein, länglich oval, glänzend schwarzbraun. Auf den Flügeldecken Punktreihen, deren Punkte inkonstant durch zarte Striche miteinander verbunden sind. Stirn ziemlich breit. Die Unterseite bei beiden Geschlechtern bis auf wenige winzige Härchen auf dem Metasternum kahl. Deutliche Sexualdimorphismen an den Protibiae und auf dem 5. Sternit.

Carter (1914: 232) machte folgende Anmerkungen zu *lilliputanus*: "Blackburn gave the colour of *lilliputanus* as black, but the elytra have some metallic gleams with a tinge of green in my specimens".

Nahe verwandt mit *Amarygmus stolidus* Blackburn, 1893, der dieselbe Gestalt und Sexualdimorphismen aufweist. Jedoch ist *stolidus* wesentlich größer als *lilliputanus*; die Beine sind bei *stolidus* gelbbraun, bei *lilliputanus* dunkelbraun bis schwarzbraun; die Punkte der Punktreihen der Flügeldecken sind bei *stolidus* wesentlich größer als bei *lilliputanus*, und sie besitzen im Gegensatz zu denen von *lilliputanus* einen rosa Grund und einen kleinen rosa Hof um die Punkte herum.

Wegen der Größe besonders zu vergleichen mit *Amarygmus minimus* Carter, 1914. *Amarygmus minimus* ist noch kleiner (Länge ca. 3,2 mm) als *A. lilliputanus*. Die Stirn ist bei *minimus* deutlich breiter als bei *lilliputanus*. Die Antennomeren 7-10 sind bei *minimus* deutlich kürzer als bei *lilliputanus*. Die Stirnnaht ist bei *lilliputanus* nur angedeutet, aber nicht eingeschnitten, bei *minimus* median tief eingeschnitten. Die Flügeldecken sind bei *lilliputanus* wesentlich länger als bei *minimus*.

Nachbeschreibung

Maße. Länge: 4,20-4,79 mm. Breite: 2,26-2,49 mm. Relationen. Halsschild: Breite/Länge 1,73-1,88; Breite Hinterecken/Breite Vorderecken 1,58-1,62. Flügeldecken: Länge/Breite 1,49-1,57; Länge Flügeldecken/Länge Halsschild 3,54-3,68; maximale Breite Flügeldecken/maximale Breite Halsschild 1,28-1,36.

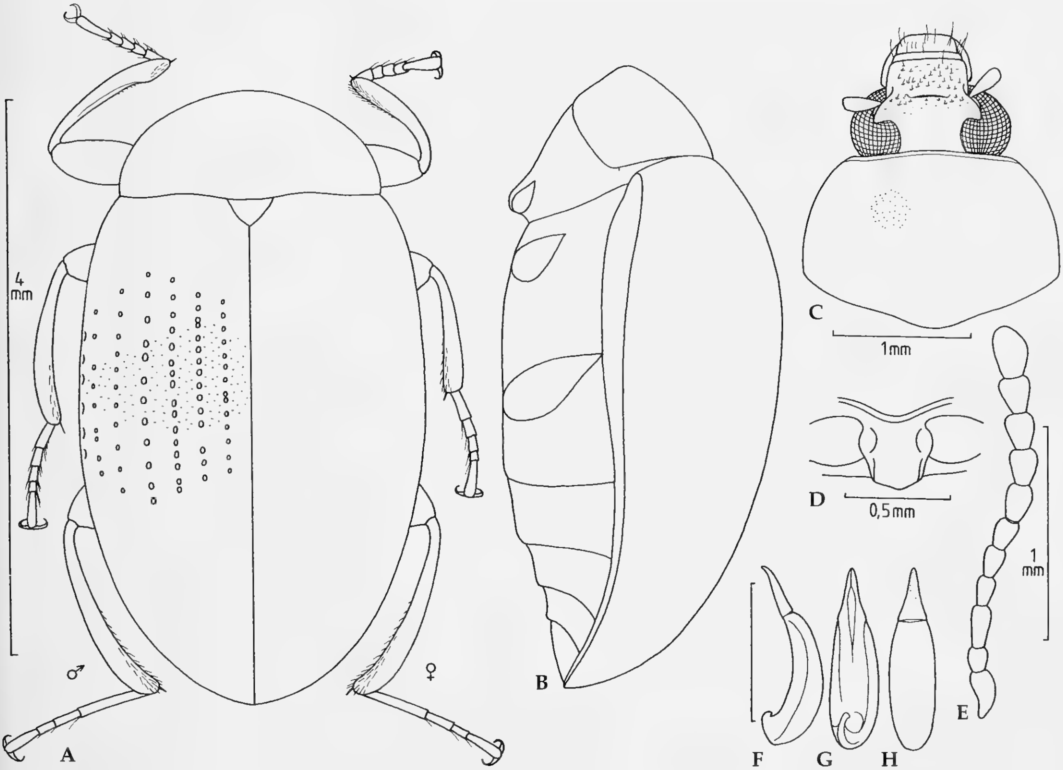

Abb. 3. *Amarygmus lilliputanus* Blackburn, 1893. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

Farbe. Flügeldecken und Halsschild schwarzbraun, glänzend. Unterseite braun bis schwarzbraun, leicht glänzend. Femora und Tibiae schwarzbraun, Tarsen braun. Fühler braun.

Kopf. Stirn etwa so breit wie die gemeinsamen Längen der 3. und 4. Antennomeren; im vorderen Teil der Stirn mit weitläufig stehenden, feinen Punkten. Wangen klein, gering gewölbt. Stirnnaht nur angedeutet, nicht eingeschnitten. Clypeus mittelweit vorgezogen, schwach gewölbt, etwas dichter punktiert als der vordere Abschnitt der Stirn. Mandibeln außen gefurcht, bifid.

Halsschild. Relativ schmal; quer deutlich, längs schwach gewölbt. Seiten verengen sich schwach gebogen nach vorne. Vorderrand sehr leicht ausgeschnitten. Vorderecken stark herabgedrückt; von schräg vorn oben betrachtet, schmal verrundet. Seitenränder gerandet; Randung des Vorderrandes in der Mitte abgeschwächt. Bei Ansicht von der Seite sind die Vorderecken verrundet rechtwinklig, die Hinterecken deutlich stumpfwinklig. Oberseite mikroretikuliert, mit nicht sehr dicht, unregelmäßig stehenden, feinen Punkten.

Scutellum. Dreickig, mit wenigen winzigen Punkten.

Flügeldecken. Länglich oval, mit deutlicher Schulterbildung. Quer stark gewölbt, längs gewölbt. Größte Breite und Höhe etwas vor der Mitte. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nahezu unsichtbar. Auf der Oberseite Punktreihen mittelgroßer, etwas länglicher Punkte, deren Abstände voneinander in den 3. und 4. Reihen unterschiedlich sind, meist zwischen den 1- bis 2-fachen ihrer Durchmesser; in der 4. Reihe etwa 22 Punkte. Interstitien eben; mit feinen, nicht sehr dicht stehenden Punkten.

Prosternum. Vorderrand durchgehend schmal aufgebogen, median zur Apophyse hin leicht muldenförmig eingezogen. Apophyse ziemlich breit; seitlich neben den Hüften verbreitert, die breiten Seitenränder sind dort aufgebogen; dazwischen eine breite, flache Furche; kaudad der Hüften etwas horizontal vorgezogen, mit subparallelen Seiten und etwas aufgebogenen, glänzenden Seitenrändern; apikal breit zugespitzt; der Grund der Apophyse ist glatt und quer etwas gewölbt.

Mesosternum. Hinterer Teil kurz; median vorne sehr tief ausgeschnitten.

Metasternum. Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Vordere Bereiche und Scheibe neben der Mediannaht mit nicht sehr dicht stehenden, kleinen bis feinen Punkten. Mediannaht in den hinteren ¾ leicht eingeschnitten. Aus den vorderen Punkten entspringen sehr kurze, zarte, anliegende Härchen.

Sternite. Sternite 1-3 mit nicht sehr dicht stehenden, feinen Punkten. Analsternit beim ♂ apikomedian relativ breit, deutlich, aber flach eingedrückt.

Fühler. Zurückgelegt beim ♂ etwas ein Drittel der Flügeldecken überlappend. Bei ♀♀ etwas kürzer. 11. Antennomer apikal verrundet. Die Längen und Breiten der Antennomeren 1-11 verhalten sich beim ♂ wie 12:5 / 6:4,5 / 11:4 / 9:4 / 9:4,5 / 8,5:6 / 10:6,5 / 10:6,5 / 11:6,5 / 11:6,5 / 15:6,5.

Beine. Nicht sehr lang. Protarsomeren beim ♂ nicht verbreitert. Femora zu den zweiten Dritteln hin etwas keulenförmig verdickt. Protibiae außen gekrümmt, innen beim ♂ in den apikalen ⅕ stark verbreitert; Meso- und Metatibiae deutlich gekrümmt und abgeplattet. Die Längen der Protarsomeren 1-5 beim ♂ sind 6:4,5:4:4:15, die der Mesotarsomeren 1-5 sind 15:7:6:5,5:15, die der Metatarsomeren 1-4 sind 34:11:8:15.

Material. Australia, Sharp Coll. 1905-313 (2♀♀ NHM); Aust., Qld., 5.XII.1988, Kuranda 4 km NW; Vr. R. Bejšák lgt. (1♂ CBj).

Amarygmus pectoralis Blackburn, 1893
Abb. 4A-H

Amarygmus pectoralis Blackburn, 1893: 96-97.

Typus. Syntypus: ♂, NHM, etikettiert: (rundes Etikett, roter Rand) Type; (rechteckiges Etikett, rote Tinte) 4735, N.S.W. T.; (handschriftlich) *Amarygmus pectoralis* Blackb.; Blackburn Coll. 1910-230 (ihm fehlen die Fühler, die linken Mesotarsomeren und das rechte Hinterbein).

Diagnose. Gehört zu den mittelgroßen, relativ schmalen Arten mit grünen bis violetten, länglichen, subparallelen Flügeldecken, auf ihnen Punktreihen mittelgroßer bis großer Punkte. *A. pectoralis* besitzt kurze Fühler, einen apikad seitlich gebogen verengten Halsschild, eine breite, etwas ausgehöhlte Prosternalapophyse und bei ♂♂ gekrümmte Protibiae, die apikal innen stark verbreitert sind. Unterseite auch bei ♂♂ kahl.

In die Gruppe länglicher Arten mit subparallelen oder seitlich nur gering verrundeten Flügeldecken und grünlicher oder violetter Farbe der Flügeldecken gehören neben pectoralis auch *Amarygmus cupido* Pascoe, 1869, *Amarygmus exilis* Pascoe, 1869, *Amarygmus picicornis* (Hope, 1843) und *Amarygmus tyrrhenus* Pascoe, 1870.

Sehr ähnlich dem *Amarygmus pectoralis* Blackburn ist *Amarygmus cupido* Pascoe, von dem ich bisher nur ♀♀ kenne. Beide Arten haben eine ähnliche Kopf- und Halsschildform sowie eine ähnliche Punktierung der Flügeldecken. *A. cupido* ist etwas kleiner, die Flügeldecken sind etwas kürzer, seitlich leicht verrundet; er besitzt eine andere Form der Prosternalapophyse (bei *cupido* ist sie deutlich schmaler als bei *pectoralis*, die mediane Furche auf der Höhe der Procoxae ist bei *cupido* schmal, bei *pectoralis* breit und flach; die Punktierung des vorderen Teils vom Metasternum ist bei *pectoralis* gröber als bei *cupido*; die violetten Flügeldecken glänzen bei *cupido* stärker als bei *pectoralis*, der Halsschild ist bei *cupido* schwarzbraun, bei *pectoralis* grünlich bis grünlich-violett.

Amarygmus picicornis (Hope) besitzt neben länglich, subparallelen Flügeldecken ebenfalls Punktreihen großer Punkte und eine violette Farbe der Flügeldecken. Der Halsschild ist im Gegensatz zu *pectoralis* matt und schwarz; die Vorderecken des Halsschildes stehen im Gegensatz zu *pectoralis* nach vorne spitz vor; die Interstitien sind bei *picicornis* zwar fein punktiert, die Punkte sind bei *picicornis* aber deutlicher; die Stirn ist bei *picicornis* wesentlich schmaler als bei *pectoralis*, die Fühler sind bei *picicornis* im Gegensatz zu *pectoralis* braun gefärbt, und die Protibiae weisen bei ♂♂ von *picicornis* apikal an den Innenseiten keine plötzliche Verbreiterung auf. *A. picicornis* ist meist etwas kleiner als *pectoralis*.

Amarygmus tyrrhenus Pascoe hat ebenfalls subparallele Flügeldecken, aber die Punkte der Reihen sind größer als bei *pectoralis*; dadurch sind auch die Interstitien der Flügeldecken schmaler als bei *pectoralis*; die Seiten des Halsschildes sind nicht wie bei *pectoralis* verrundet, sondern in der hinteren Hälfte subparallel, seine Vorderecken sind im Gegensatz zu *pectoralis* leicht spitzwinklig; im Gegensatz zu *pectoralis* sind die Wangen deutlich gewölbt; die Form der Prosternalapophyse ist bei *tyrrhenus* schmal, langgezogen und nicht flach und relativ breit wie bei *pectoralis*, und bei ♂♂ von *tyrrhenus* sind die Innenseiten der Protibiae apikal nicht verbreitert.

Amarygmus exilis Pascoe ist etwas kleiner und schmaler als *pectoralis*; besitzt eine noch breitere Stirn als *pectoralis* und einen wesentlich kürzeren Clypeus. Der Halsschild ist meist grün und die Flügeldecken violett. Die Punkte der Punktreihen auf den Flügeldecken sind bei *exilis* kleiner als bei *pectoralis* und damit die Interstitien breiter. Die Prosternalapophyse ist bei *exilis* schmaler als bei *pectoralis*. Über die Form der Protibiae bei ♂♂ kann ich keine Aussagen machen.

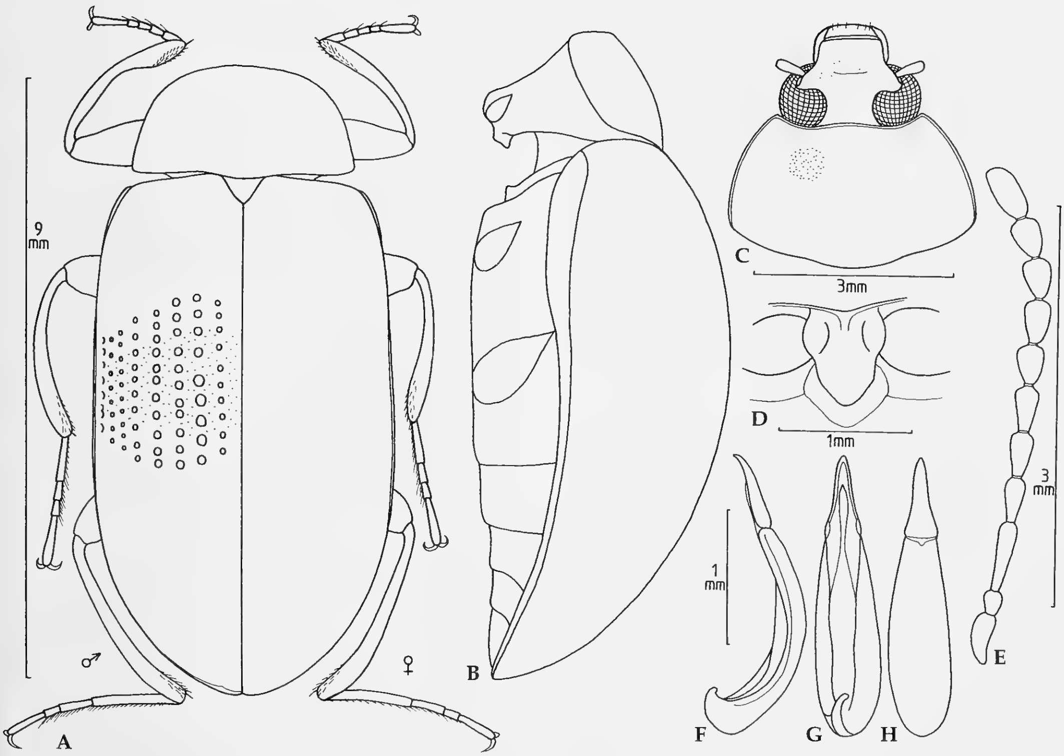

Abb. 4. *Amarygmus pectoralis* Blackburn, 1893. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

Nachbeschreibung

Maße. Länge: 8,20-9,24 mm. Breite: 3,98-4,38 mm. Relationen. Halsschild: Breite/Länge 1,80-1,87; Breite Hinterecken/Breite Vorderecken 1,67-1,71. Flügeldecken: Länge/Breite 1,66-1,71; Länge Flügeldecken/Länge Halsschild 3,82-3,96; maximale Breite Flügeldecken/maximale Breite Halsschild 1,25-1,30.

Farbe. Halsschild und Flügeldecken beim Syntypus grün, mit violettem Schimmer, bei den anderen zwei Exemplaren violett (wahrscheinlich immatur), leicht glänzend, leicht mikroretikuliert. Unterseite schwarz; Metasternum deutlich glänzend, Sternite etwas matter. Beine einschließlich Tarsen schwarz. Fühler schwarz, 11. Antennomer in den apikalen 40 % gelbbraun.

Kopf. Vorderer Teil von Stirn und Clypeus annähernd eben. Stirn ziemlich breit (Breite entspricht etwa der Summe der Längen der 3. und 4. Antennomeren beim ♀). Wangen sehr gering gewölbt. Stirnnaht nur median schwach eingeschnitten. Clypeus vorgezogen; Seiten verengen sich etwas nach vorne. Clypeus und Stirn mit sehr feinen Punkten, bei leicht schrägem Aufblick wie unpunktiert erscheinend. Mandibeln bifid.

Halsschild. Kurz. Quer und längs wenig gewölbt; Seiten verengen sich verrundet nach vorn; Vorderecken etwas verrundet vorstehend; Vorderrand nicht sehr stark ausgeschnitten, mit etwas gegen den Kopf vorstehender Mitte. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten schmal sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken verrundet stumpfwinklig. Oberseite mit kleinen, nicht sehr deutlichen, ziemlich dicht stehenden Punkten.

Scutellum. Dreieckig, mit etwas verrundeten Seiten; unpunktiert.

. Länglich. Quer deutlicher als Halsschild gewölbt; längs gewölbt; mit der größten Höhe etwa in der Mitte. Schultern etwa so breit wie der dahinter liegende, subparallele Teil der Flügeldecken. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben sehr schmal, aber fast in der gesamten Länge sichtbar. In den Punktreihen große Punkte, die nicht durch Striche miteinander verbunden sind; die Abstände der Punkte voneinander auf der Scheibe sind meist kleiner als die Punktdurchmesser, etwa 30 Punkte in der 4. Reihe. Interstitien schmal, mit sehr feinen, mäßig dicht stehenden Punkten.

Prosternum. Vorderrand seitlich schmal aufgebogen; median ist diese Randung kurz unterbrochen. Vom Vorderrand zieht median ein kurzer Kiel in die Apophyse hinein. Apophyse ziemlich breit; neben den Procoxae finden sich ventrad angehobene, verbreiterte, glänzende Seitenränder; kaudad der Hüften horizontal vorgezogen, kurz mit subparallelen Seiten, apikal dann halbkreisförmig abgeschlossen; Grund der Apophyse unruhig, aber ohne aufragende Strukturen.

Mesosternum. Hinterer Teil vorne median tief ausgeschnitten; seitlich hinten beiderseits gefurcht.

Metasternum. Vorderrand zwischen den Mesocoxae verrundet und schmal gerandet. Vordere Hälfte vom Metasternum mit groben Punkten, hinten sind die Punkte kleiner. Medianlinie in den hinteren 60 % fein eingeschnitten.

Sternite. Vorderrand zwischen den Metacoxae spitzbogig, gerandet. Scheibe des ersten Sternits dicht, klein punktiert. Punkte auf den Scheiben der zweiten und dritten Sternite zunehmend kleiner. Die Sternite vier und fünf fein bis winzig punktiert. Fünftes Sternit bei ♂♂ apikomedian deutlich eingedrückt.

Fühler. Ich kenne nur die Fühler des ♀; sie sind ziemlich kurz. 11. Antennomer apikal verrundet. Die Längen und Breiten der Antennomeren 1-11 verhalten sich wie 7:4 / 5:3,5 / 12:4 / 8:4 / 9:4,5 / 9:5 / 8:5 / 9:5 / 8:5 / 8:5 / 11:5.

Beine. Kurz. Profemora kompreß, zu den zweiten Dritteln hin keulenförmig verdickt. Protibiae bei ♂♂ außen in den basalen 60 % gerade, dann gekrümmt und in den apikalen 30 % gerade, in diesem Bereich an den Innenseiten plötzlich verbreitert; bei ♀♀ sind die Protibiae gleichmäßig leicht gekrümmt. Mesotibiae deutlich gekrümmt. Metatibiae leicht gekrümmt. Protarsomeren 1-4 bei ♂♂ nicht verbreitert. Die Längen der Protarsomeren 1-5 (beim ♂) sind 6:4:4:4:13, die der Mesotarsomeren 1-5 sind 16:6:4:4:14, die der Metatarsomeren 1-4 sind 31:12:6:13.

Material. Vict., Andrewes Bequest, B.M.1922-221; *Amarygmus pectoralis*; K. G. Blair det. (1♀ NHM); Queensland; F. Bates 81-19 (1♂ NHM).

Amarygmus porosus Blackburn, 1893
Abb. 5A-H

Amarygmus porosus Blackburn, 1893: 98-99.
Amarygmus regius Carter, 1914: 229-230 (**syn. nov.**).

Typen. Holotypus von *porosus*: ♀, NHM, etikettiert: 4744T, Cooktown; (handschriftlich) *Amarygmus porosus*, Blackb., (rotes, rundes Etikett) Type; British Museum Loan. 16607; Blackburn coll. 1910-236. (Holotypus ist stark beschädigt, ohne Tarsen; nur ein Fühler teilweise erhalten).

Vier Syntypen von *regius* im SAM: 1. Syntype, auf einem Plättchen geklebt: (gedruckt) Cairns dist., A. M. Lea; (handschriftlich, Carters Handschrift) *Amarygmus regius* Cart., Cotype (♂); 2. Syntype, auf einem Plättchen geklebt: Cairns dist., P. Dodd; (handschriftlich, Carters Handschrift) *Amarygmus regius* Cart., Cotype (♂); 3. und 4. Syntype, gemeinsam auf einem Plättchen geklebt (♂ und ♀): Cairns dist, A. M. Lea; (handschriftlich, Carters Handschrift) *Amarygmus regius* Cart.; Cotype.

Diagnose. Große, gewölbte Art, mit großen, tief eingedrückten Punkten in dem Punktreihen der länglichen Flügeldecken; mit nicht sehr breiter Stirn; mit mattem, schwarzen Halsschild, grünen oder violetten, meist leicht matten Flügeldecken und mit schwarzen Beinen. Die Art ist hinsichtlich Größe, Form der Flügeldecken recht variabel, so daß der Eindruck entstehen kann, daß es sich um verschiedene Taxa handelt: Die Flügeldecken können zum Beispiel strickt parallel oder leicht oval sein; die Farbe der Flügeldecken kann je nach Reifezustand des Exemplars wechseln (siehe "Farbe").

Sehr ähnlich in Form, Größe und Form des Aedoeagus ist *Amarygmus watti* Bremer, 2005 [nec *Amarygmus tristis* (Fabricius, 1798)], der im Küstenbereich von New South Wales sowie auf der Nordinsel von New Zealand vorkommt. Bei dieser Art sind die Punkte der Punktreihen der Flügeldecken etwas kleiner als bei *porosus*; die Farbe der Flügeldecken ist meist schwarz oder nur mit sehr leicht violettem oder bläulichen Schimmer. Ich halte es aber für möglich, daß *watti* nur eine Subspecies von *porosus* ist. Gegenwärtig habe ich zu wenig Material mit verläßlichen Fundortangaben gesehen, um darüber eine Entscheidung zu treffen.

Nach Blackburn hat *Chalcopteroides catenulatus* (Blackburn, 1892) eine ähnliche Struktur der Flügeldecken wie *A. porosus*.

Nachbeschreibung

Maße. Länge: 9,6-13,2 mm. Breite: 5,7-7,3 mm. Relationen. Halsschild: Breite/Länge 1,70-1,89; Breite Hinterecken/Breite Vorderecken 1,73-1,95. Flügeldecken: Länge/Breite 1,48-1,58; Länge Flügeldecken/Länge Halsschild 3,68-3,94; Breite Flügeldecken/Breite Halsschild 1,39-1,47.

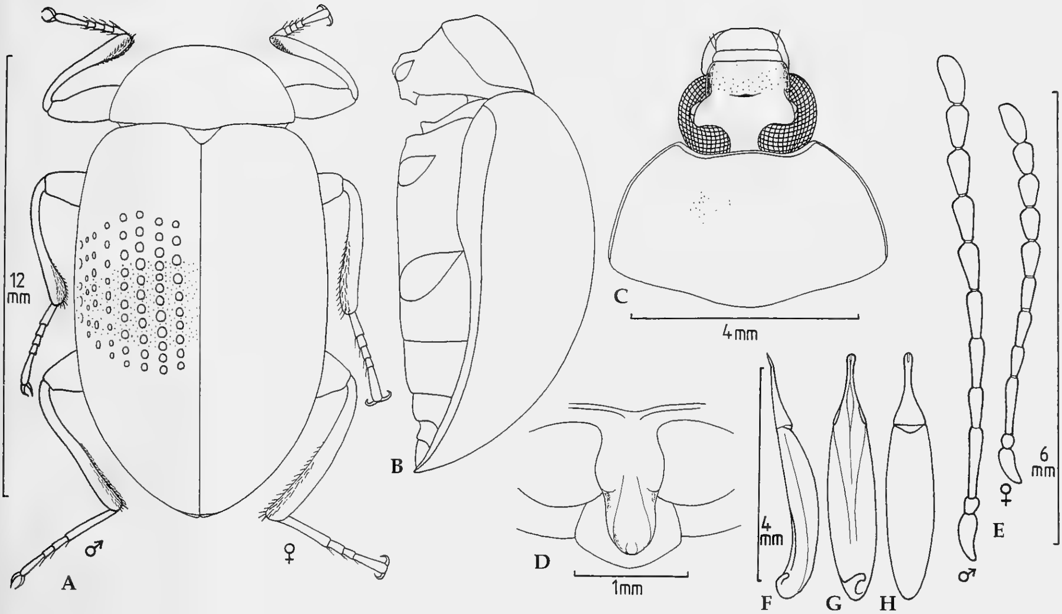

Abb. 5. *Amarygmus porosus* Blackburn, 1893. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler, ♂ und ♀. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

Farbe. Halsschild schwarz, matt. Stirn schwarz, matt; Clypeus schwarzbraun, etwas glänzend. Flügeldecken bei maturen Exemplaren grün, matt, bei gering unreifen Exemplaren grün, aber mit violettem ersten Interstitium und lateral leicht violettem Farbton, bei immaturen Exemplaren oft leuchtend violette Flügeldecken. Femora: Basis braun, Kappen schwarz. Tibiae braun oder schwarz, glänzend. Unterseite bei maturen Exemplaren schwarz, Metasternum glänzt etwas, Sternite matt.

Kopf. Stirn nicht sehr breit; etwas breiter als die Länge des 4. Antennomer (wie 13:12). Wangen deutlich gewölbt. Stirnnaht leicht eingedrückt, nicht wesentlich eingeschnitten. Clypeus vorgezogen, seitlich flach herabgebogen; Seiten gerade. Clypeus klein, sehr oberflächlich und ziemlich dicht punktiert, Stirn weitläufiger als Clypeus und noch feiner punktiert. Mentum umgekehrt trapezförmig; die Mitte ist querüber nicht sehr stark gewölbt. Unterseite des Halses klein, sehr dicht punktiert. Mandibeln apikal gekerbt.

Halsschild. Querüber und längs gleichmäßig, aber nicht sehr stark gewölbt. Seiten verengen sich verrundet nach vorne. Vorderrand etwas ausgeschnitten. Vorderecken bei Blick von oben annähernd rechtwinklig. Seitenränder gerandet; Randung des Vorderrandes in der Mitte unterbrochen. Bei Anblick von oben sind die Randungen der Seiten in der ganzen Länge gut sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit verwaschenen, kleinen, nicht sehr dicht und unregelmäßig stehenden Punkten; Grund mikroretikuliert.

Scutellum. Dreieckig, mit verrundeten Seiten; wie die Interstitien punktiert.

Flügeldecken. Robust, meist länglich oval. Quer stark, längs auch deutlich gewölbt. Größte Höhe etwa am Beginn des zweiten Drittels. Schultern deutlich. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben mit Ausnahme der Schultern und des Apex extrem schmal sichtbar. Auf der Oberseite Punktreihen sehr großer, sehr deutlicher Punkte, deren Abstände voneinander in den 4. Reihen auf der Scheibe etwas kleiner als die Punktdurchmesser sind; in den 4. Reihen etwa 23 Punkte; Punkte in den ersten Reihen kleiner und enger stehend. Interstitien durch die eingedrückten Punkte nicht sehr breit, angedeutet gewölbt; auf mikroretikuliertem Grund feine Punkte, die auch die Punkte der Reihen umfassen.

Prosternum. Vorderrand durchgehend aufgebogen, median etwas zu der Apophyse hin eingezogen. Apophyse schmal; in Längsrichtung zwischen Vorderrand und dem Bezirk zwischen den Procoxae etwas aufgebogen und dahinter herabgebogen, aber trotzdem weit kaudad vorgezogen; neben den Hüften sind die Seiten verbreitert und deutlich ventrad angehoben; dazwischen eine ziemlich tiefe, schmale Furche; hinter den Hüften sind die Seitenränder etwas angehoben, und die Seiten verbreitern sich leicht; apikal verrundet, median dort mit etwas angehobenem, stumpfen Kiel.

Mesosternum. Vorderrand des hinteren Teils median verrundet ausgeschnitten; Seiten den Ausschnitts wulstartig angehoben, mit einer scharfen Kante nach hinten; hinterer Teil beiderseits gefurcht.

Metasternum. Vorderrand zwischen den Metacoxae dick gerandet. Vordere Querfurchen hinter den Mesocoxae punktiert. Hintere Querfurchen vor den Metacoxae tief eingeschnitten, undeutlich gefurcht. Scheibe mit feinen, unauffälligen Pünktchen; aus ihnen entspringen winzige, bei 25-facher Vergrößerung gerade sichtbare Härchen. Medianlinie in den hinteren ⅔ breit eingedrückt.

Sternite. Deutlich matter als Metasternum. Vorderrand zwischen den Metacoxae spitzbogig, dick gerandet. Querfurchen hinter den Metacoxae punktiert. Sternite 1 und 2 geriefelt und fein, flach punktiert; Sternite 3-5 sehr fein punktiert. Analsternit bei ♂♂ apikomedian etwas eingedrückt.

Fühler. Von mittlerer Länge; bei ♂♂ deutlich länger als bei ♀♀; zurückgelegt bei ♂♂ etwas das erste Drittel, bei ♀♀ etwa ein Viertel der Flügeldecken überlappend. 11. Antennomer asymmetrisch verrundet. Die Längen und Breiten der Antennomeren 1-11 verhalten sich beim ♂ wie 16:6 / 6:4½ / 23:5 / 13:5 / 17:5½ / 15:5½ / 16:7½ / 15:7½ / 15:7½ / 15:7½ / 18:7½, beim ♀ wie 19:6 / 7½:5 / 21:5½ / 12:5½ / 14:5½ / 13:6 / 17:7½ / 14:8 / 14:8 / 14:8 / 17:8.

Beine. Kurz. Femora stark keulenartig verdickt. Deutliche Sexualdimorphismen an den Pro- und Mesotibiae. Pro- und Mesotibiae in den basalen Hälften gekrümmt, außen in den apikalen Hälften gerade; bei ♂♂ an den Innenseiten in den apikalen Dritteln graduell verdickt und an den Innenseiten in dem verbreiterten Bereich mit einem schmalen Feld dicht stehender Haare. Metatibiae leicht gekrümmt, an den Innenseiten in den apikalen Hälften bei ♂♂ mit mittellangen, schräg abstehenden, zarten Haaren. Protarsomeren bei ♂♂ nur sehr leicht verbreitert, auf den Sohlenflächen mit bürstenartigem Haarbesatz; diese Haare schauen seitlich an den Protarsomeren 1-4 etwas hervor. Die Längen der Protarsomeren 1-5 sind beim ♂ wie 8:8:6:5:20, die der Mesotarsomeren 1-5 sind 14:9:7:6½:20, die Metatarsomeren 1-4 sind 27:11:6:20.

Material. Murray, 78.41 (1♀ NHM); Australia, Queensland, Bunya Mt. 8 km n. Mt. Koonwarra, 24.1.1982, Baehr B. & M. (2♂♂ ZSM); N. Holl., Deyrolle, *punctatostriat.* Deyr. (1♀ ZSM); N. Holl., Doué (1♀ ZSM); N. Holl., Boulay (1♂, 1♀ ZSM); Aust. Qu., Mt. Glorious, 4.2.1993, V. R. Bejšák lgt. (1♂ CBj). Nach Gebien (1920) kommt diese Art auch auf der Thursday-Insel in der Torres-Straße vor.

Amarygmus rimosus Blackburn, 1893
Abb. 6A-H

Amarygmus rimosus Blackburn, 1893: 103-104.
Platolenes rimosus: Kulzer 1951, 547.
Amarygmus rimosus Blackburn, 1893; [stat. rehabil.]: Bremer 2001a: 57.

Typus. Ein Syntypus: ♀, NHM, etikettiert: (rundes Etikett, roter Rand) Type; (eckiges Etikett, rote Tinte) 4731, Rich. R. T; (handschriftlich) *Amarygmus rimosus* Blackburn; Blackburn Coll. 1910-230.

Diagnose. Ziemlich große, lang gestreckte Art, mit annähernd parallelen Flügeldecken, mit großen, unregelmäßig stehenden Punkten in den Punktreihen der Flügeldecken, die einen blauen Grund und einen schmalen blauen Hof aufweisen, wobei meist mehrere, nahe beieinander liegende Punkte durch einen gemeinsamen Hof umgeben sind. Halsschild trapezförmig. Stirn ziemlich schmal. Fühler kurz. Spitze des Aedoeagus, von der Seite gesehen, annähernd gerade. Bei ♂♂ sind die Protarsomeren 1-3 verbreitert.

Außerordentlich ähnlich ist der aus dem nördlichen Queensland stammende *Amarygmus erubescens* Carter, 1914, der dieselbe Gestalt, Größe, Farbe der Oberseite und in den Punktreihen der Flügeldecken ebenfalls große, blaue Punkte mit einem schmalen, blauen Hof um die Punkte herum besitzt. Bei *rimosus* stehen die großen Punkte der Punktreihen unregelmäßig, und der blaue Hof umschließt meist mehrere Punkte, bei *erubescens* sind die Punktabstände regelmäßig, und der blaue Hof umschließt nur jeweils einen Punkt; die Stirn ist bei *rimosus* etwas schmaler als bei *erubescens*, die Interstitien der Flügeldecken sind bei *rimosus* meist etwas schwächer als bei *erubescens* punktiert; die Fühler, besonders auffallend das 11. Antennomer, sind bei *rimosus* kürzer als bei *erubescens*, die Spitze des Aedoeagus ist bei *rimosus* gerade, bei *erubescens* ventrad gekrümmt.

Nachbeschreibung

Maße. Länge: 9,95-10,74 mm. Breite: 5,10-5,33 mm. Relationen. Halsschild: Breite/Länge 1,79-1,89; Breite Hinterecken/Breite Vorderecken 1,72-1,86. Flügeldecken: Länge/Breite 1,58-1,76; Länge Flügeldecken/Länge Halsschild 3,68-4,00; maximale Breite Flügeldecken/maximale Breite Halsschild 1,24-1,30.

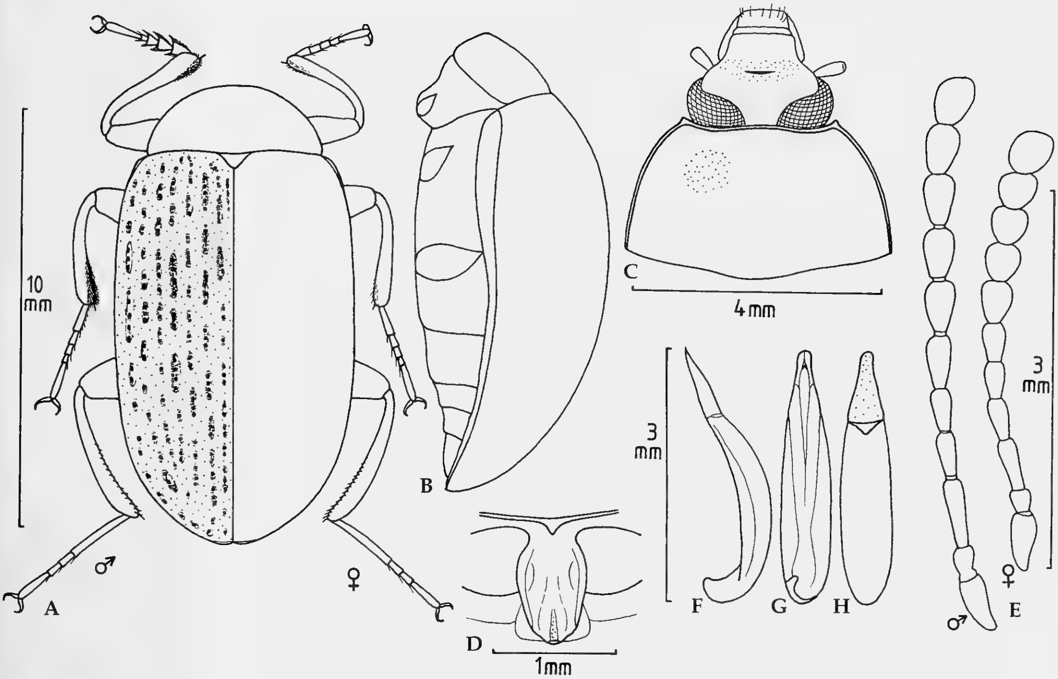

Abb. 6. *Amarygmus rimosus* Blackburn, 1893. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler, ♂ und ♀. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

Farbe. Oberseite wie unter *Diagnose* geschildet; Unterseite schwarz, Metasternum glänzend, Sternite matt. Beine einschließlich Femora und Fühler rotbraun.

Kopf. Stirn nicht sehr breit, etwa so breit die Länge des 3. Antennomers. In Längsrichtung gleichmäßig zur tief eingedrückten Stirnnaht geneigt. Wangen ziemlich weit lateral an der Oberseite des Kopfes gelegen, etwas gewölbt. Stirnnaht breit und tief eingedrückt, aber nicht eingeschnitten. Clypeus vorgezogen, längs etwas gewölbt, quer kaum gewölbt. Clypeus und Stirn fein und nicht sehr dicht punktiert. Mentum umgekehrt trapezförmig, mit breiten, ebenen, glänzenden Seiten; median querüber nur gering gewölbt. Mandibeln außen gefurcht, bifid.

Halsschild. Meist trapezförmig. Quer und längs ziemlich flach, nur seitlich etwas herabgebogen. Vorderecken bei orthogradem Aufblick eckig, stumpfwinklig. Hinterecken schmal verrundet und stumpfwinklig. Seitenränder und Vorderrand durchgehend gerandet (Randung des Vorderrandes median manchmal etwas abgeschwächt). Bei orthogradem Aufblick ist die Randung der Seiten durchgehend sichtbar. Bei Ansicht von der Seite sind die Vorderecken schmal verrundet und stumpfwinklig, die Hinterecken eckig und leicht stumpfwinklig. Oberseite mit kleinen, ziemlich dicht stehenden Punkten.

Scutellum. Dreieckig, Seiten etwas geschwungen und gebogen.

Flügeldecken. Lang gestreckt, mit subparallelen Seiten; quer deutlich gewölbt, längs mäßiggradig gewölbt. Größte Höhe etwa zu Beginn des zweiten Drittels der Flügeldecken. Schulter etwas entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben mit Ausnahme des Schulterbereiches sichtbar. Auf der Oberseite Punktreihen großer, aber unregelmäßig stehender und geformter Punkte, wobei häufig einige Punkte dicht zusammen liegen, andere aber größere Abstände voneinander haben; in der 4. Reihe etwa 18 Punkte. Interstitien leicht gewölbt, fein, unregelmäßig punktiert.

Prosternum. Vorderrand durchgehend aufgebogen, median eine sehr kurze Ausziehung am Innenrand. Apophyse ziemlich schmal; länglich oval, apikomedian mit einem schmalen, kurz dorsad vorstehenden Zapfen; seitliche Ränder neben den Procoxae etwas angehoben, dazwischen eine flache Furche.

Mesosternum. Hinterer Teil median ausgeschnitten; hinten lateral mit je einer breiten, deutlichen Furche.

Metasternum. Vorderrand zwischen den Mesocoxae verrundet, dick gerandet. Vorderer Teil der Scheibe mit kleinen bis mittelgroßen Punkten, hinterer Teil mit schütter stehenden, feinen Punkten. Mittellinie in den hinteren ¾ schwach eingeschnitten.

Sternite. Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Die ersten 3 Sternite sind mittelgroß und dicht punktiert; die weiteren 2 Sternite weisen nur winzige Punkte auf. Analsternit des ♂ apikomedian sehr schwach eingedrückt, ohne scharfe Begrenzung.

Fühler. Kurz, bei ♀♀ nur mit 2 Antennomeren die Basis der Flügeldecken überlappend, bei ♂♂ das vordere Viertel der Flügeldecken überlappend. 11. Antennomer apikal breit verrundet und bei ♀♀ kurz. Die Längen und Breiten der Antennomeren 1-11 bei einem ♂ verhalten sich wie 12:5,5 / 5:4,5 / 12,5:4 / 9:4 / 9:4,5 / 10:5 / 10:6 / 10:6 / 10:7 / 10:7 / 11,5:7, bei einem ♀ wie 11:6 / 5,5:5 / 11:5 / 8:5 / 8:5 / 8:5 / 9:6,5 / 8:6,5 / 7:7 / 7:7 / 9:8,5.

Beine. Kurz. Femora zu den zweiten Dritteln hin keulenförmig verdickt. Protibiae in den basalen Hälften stärker gekrümmt, in den apikalen Hälften annähernd gerade. Mesotibiae ähnlich geformt, bei ♂♂ an den Innenseiten in den apikalen Vierteln mit einem Feld dicht stehender, anliegender Haare. Metatibiae leicht gekrümmt, an den Innenseiten mit dicht stehenden Borsten. Die Protarsomeren 1-3 bei ♂♂ sind mäßiggradig verbreitert und leicht verlängert. Die Längen der Protarsomeren 1-5 bei einem ♂ sind 8:8:6:4:22, die der Mesotarsomeren 1-5 sind 14:9:5,5:4:22, die der Metatarsomeren 1-4 sind 35:10:6:23.

Material. Richmond R., N. S. Wales, B.M. 1909-174 (1♂ NHM); New Holland (1♀ NHM); Aust., NSW, Valla Beach, 12.VII.1994, Vr. R. Bejšak leg. (1♂ CBj).

Amarygmus ruficornis Blackburn, 1893
Abb. 7A-H

Amarygmus ruficornis Blackburn, 1893: 96.

Typus. Syntypus, wahrscheinlich ♂, NHM, etikettiert: (rundes Etikett, roter Rand) Type; (rechteckiges Etikett, rote Tinte) 4740 Richm. R., (handschriftlich) A. ruficornis Blackb.

Diagnose. Klein; länglich oval; Oberseite leicht glänzend, schwarz-violett, mit Punktreihen großer Punkte auf den Flügeldecken; Femora und Tibiae schwarz, aber Tarsen und Fühler gelbbraun bis rotbraun. Besitzt bei ♂♂ gleichmäßig gekrümmte Protibiae mit apikalem Haarfeld an den Innenseiten; die Protibiae sind aber apikal nicht an den Innenseiten plötzlich verbreitert.

Eine ähnliche Körperform hat der kleinere *Amarygmus lilliputanus* Blackburn, 1893, dessen Punkte der Punktreihen der Flügeldecken aber kleiner sind, im männlichen Geschlecht sind bei *lilliputanus* apikal die Innenseiten der Protibiae plötzlich verbreitert, nicht so bei *ruficornis*.

Der in der Form ebenfalls ähnliche, aber etwas größere *Amarygmus stolidus* Blackburn, 1893 hat im Gegensatz zu *ruficornis* rotbraune Beine, im männlichen Geschlecht apikal verbreiterte Protibiae und eine nicht sehr intensive rosa Färbung der Punkte der Punktreihen, diese Punkte sind bei *stolidus* aber nicht so groß und markant wie bei *ruficornis*.

Nachbeschreibung

Maße. Länge 6,13+6,13 mm. Breite: 3,03+3,07 mm. Relationen. Halsschild: Breite/Länge 1,66+1,67; Breite Hinterecken/Breite Vorderecken 1,53+1,62. Flügeldecken: Länge/Breite 1,66+1,66; Länge Flügeldecken/Länge Halsschild 3,82+3,88; maximale Breite Flügeldecken/maximale Breite Halsschild 1,38+1,40.

Farbe. Oberseite schwarz-violett, etwas glänzend; auf dem hinteren Teil der Flügeldecken – bei schräger Ansicht von hinten – farbige Reflexe in Längsrichtung. Unterseite schwarz, glänzend. Femora und Tibiae schwarz; Tarsen gelbbraun. Fühler gelbbraun oder rotbraun. Palpen und Mentum gelbbraun.

Kopf. Mittelbreite Stirn; etwas schmaler als die gemeinsamen Längen der 2. und 3. Antennomeren (wie 22:24). Wangen kurz, gering gewölbt. Stirnnaht nur median sehr leicht eingedrückt, kaum sichtbar eingeschnitten. Clypeus mittelweit vorgezogen, längs und quer leicht gewölbt. Clypeus und Stirn mit schütter stehenden, kleinen Punkten. Mentum umgekehrt trapezförmig; mit breiten, ebenen, glänzenden Seitenrändern; median dazwischen matt, stark gewölbt. Mandibeln außen gefurcht, bifid.

Halsschild. Trapezförmig; quer gleichmäßig, aber nicht stark gewölbt; längs schwach gewölbt. Seiten nach vorn annähernd gerade verengt. Vorderrand sehr leicht ausgeschnitten. Vorderecken nicht vorgezogen. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten durchgehend sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit feinen, weitläufig stehenden Punkten.

Scutellum. Dreieckig; mit wenigen winzigen Pünktchen.

Flügeldecken. Länglich; in der Mitte mit subparallelen Seiten; Schultern entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkan-

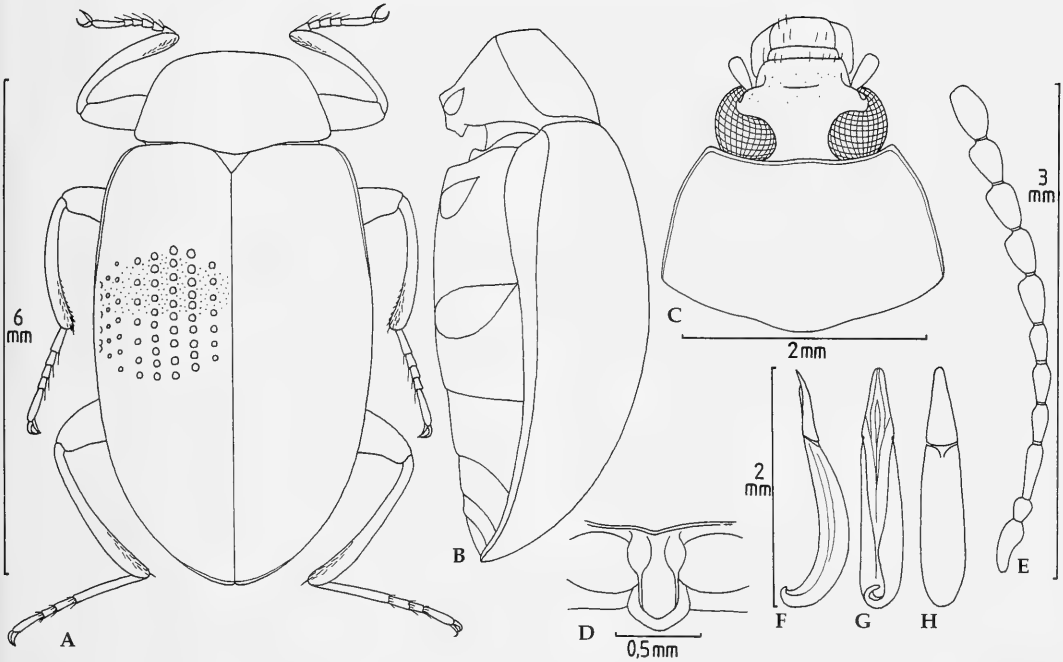

Abb. 7. *Amarygmus ruficornis* Blackburn, 1893. **A.** Habitus. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

ten von oben an den Schultern und kurz in der Mitte schmal sichtbar. Quer und längs nicht sehr stark gewölbt; größte Höhe etwas vor der Mitte. Auf der Oberseite Punktreihen mit nicht verbundenen, großen Punkten, deren Abstände voneinander ab der 3. Reihe etwas kleiner als die Punktdurchmesser sind; etwa 25 Punkte in der 4. Reihe. Interstitien eben, nur hinten seitlich, durch die stark eingedrückten, großen Punkte bedingt, leicht gewölbt; mit feinen, deutlichen, ziemlich dicht stehenden Punkten.

Prosternum. Vorderrand durchgehend aufgebogen, median leicht zur Apophyse hin eingezogen. Apophyse nicht sehr breit; neben den Hüften sind die Seitenränder etwas lateraliter verbreitert und etwas ventrad angehoben; dazwischen eine seichte Furche; hinter den Hüften horizontal vorgezogen, mit annähernd parallelen Seiten; apikal stumpf zugespitzt; medianer Bereich hinter den Hüften glatt, quer leicht gewölbt.

Mesosternum. Vorderrand des hinteren Teils median verrundet, nicht sehr tief ausgeschnitten. Hinterer Teil mit glatter Oberfläche.

Metasternum. Vorne und entlang der Mediannaht mit mittelgroßen Punkten; seitlich werden die Punkte kleiner. Mediannaht etwas eingedrückt und in der ganzen Länge leicht eingeschnitten.

Sternite. Vorderrand zwischen den Metacoxae spitzbogig, gerandet. 1. Sternit und vorderer Teil des 2. Sternits mit mittelgroßen Punkten; hinterer Teil des 2. Sternits und Sternite 3-5 fein punktiert. 5. Sternit bei ♂♂ ohne sexualdimorphe Besonderheiten.

Fühler. Zurückgelegt etwa das erste Drittel der Flügeldecken überlappend. 11. Antennomer apikal verrundet. Die Längen und Breiten der Antennomeren 1-11 verhalten sich wie 13:7,5 / 9:6 / 15:5,5 / 11:5,5 / 12:5,5 / 11:5,5 / 14:7,5 / 14:8 / 14:8 / 14:8 / 18:8.

Beine. Femora zu den zweiten Dritteln hin etwas keulenförmig aufgetrieben. Protibiae außen leicht gekrümmt, innen in den apikalen 40 % bei ♂♂ graduell verdickt (aber nicht plötzlich verbreitert). Mesotibiae etwas stärker als Protibiae gekrümmt. Metatibiae leicht gekrümmt. Protarsomeren bei ♂♂ sehr leicht verbreitert und Sohlenflächen bürstenartig behaart. Die Längen der Protarsomeren 1-5 sind 6:6:6:4:21, die der Mesotarsomeren 1-5 sind 14:9:8:5:22, die der Metatarsomeren 1-4 sind 35:11:5:22.

Material. Australia, NSW, Macksville, XII.1992, leg. Wachtel (1♂ ZSMB).

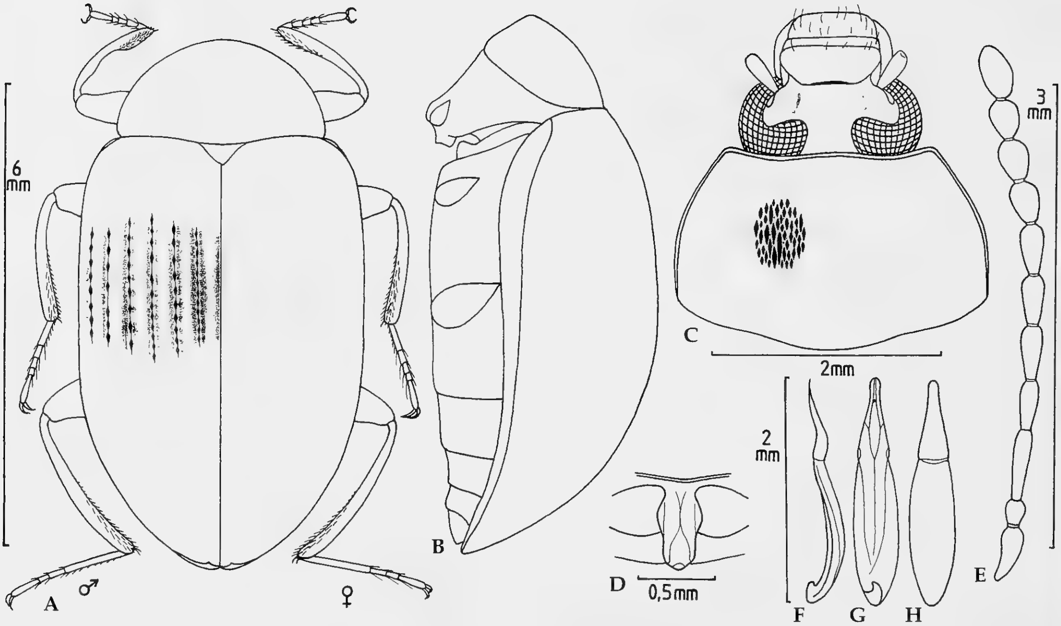

Abb. 8. *Amarygmus rugaticollis* Blackburn, 1893. **A.** Habitus. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

Amarygmus rugaticollis Blackburn, 1893
Abb. 8A-H

Amarygmus rugaticollis Blackburn, 1893: 104-105.

Typen. Zwei Syntypen, auf einem Plättchen geklebt, im NHM, auf diesem Plättchen handschriftlich geschrieben: T 4748; (rundes Etikett mit rotem Rand) Type; (handschriftlich) *Amarygmus rugaticollis* Blackb.

Diagnose. Kleine, matte Art mit auffälligem Halsschild (mit dicht stehenden, länglichen Punkten, die in Längsrichtung angeordnet sind, ein spindelförmiges Aussehen haben und die durch schmale Stege getrennt sind), eingedrückte Striae auf den Flügeldecken mit länglichen, kleinen Punkten; auf den Interstitien, bei 50-facher Vergrößerung sichtbar, winzige, helle, anliegende Härchen; bei ♂♂ sind die apikalen 40 % der Protibiae stark verbreitert; mittellange Fühler, mittelbreite Stirn.

Am ehesten zu verwechseln mit dem gleich großen *Amarygmus minutus* Pascoe, 1869, der in demselben Gebiet vorkommt. *A. minutus* hat einen dicht punktierten Halsschild, und die Punkte können auch ein wenig länglich sein, aber sie stehen bei weitem nicht so dicht wie bei *rugaticollis*, und die Punkte sind auch nicht spindelförmig; außerdem hat *minutus* nicht wie *rugaticollis* zwischen den Punkten etwas erhabene Stege. Die Flügeldecken glänzen bei *minutus* etwas, die Interstitien sind deutlich punktiert, und die Punkte der Reihen sind groß; bei *rugaticollis* sind die matten Interstitien nahezu unpunktiert, und die Punkte in den Striae sind wesentlich kleiner als bei *minutus*.

Nachbeschreibung

Maße. Länge: 5,81-6,61 mm. Breite: 2,87-3,54 mm. Relationen. Halsschild: Breite/Länge 1,50-1,60; Breite Hinterecken/Breite Vorderecken 1,62-1,64. Flügeldecken: Länge/Breite 1,46-1,61; Länge Flügeldecken/Länge Halsschild 3,22-3,25; maximale Breite Flügeldecken/maximale Breite Halsschild 1,33-1,39.

Farbe. Oberseite schwarz, matt; Tarsen braun. Fühler schwarzbraun bis dunkelbraun. Unterseite schwarz, glänzend.

Kopf. Mittelbreite Stirn, etwas schmaler als die Länge des 3. Antennomers (wie 20:22), bei beiden Geschlechtern gleich breit. Wangen gewölbt. Stirnnaht median leicht eingeschnitten. Clypeus vorgezogen, apikad etwas verbreitert, längs und quer etwas gewölbt. Stirn und Clypeus dicht, ziemlich groß und grob punktiert; aus den Punkten des Clypeus entspringen sehr kurze Härchen. Mentum apikad verbreitert; mit etwas gebogenen Seiten; Seitenränder breit, eben, glänzend. Mandibeln außen gefurcht, bifid.

Halsschild. Quer und längs leicht gewölbt. Seiten etwas verrundet, bei manchen Exemplaren mit der größten Breite in der Mitte und nach vorn und hinten leicht verrundet eingezogen, bei anderen Exemplaren nach hinten subparallel. Vorderrand deutlich ausgeschnitten; Vorderecken dadurch bei orhogradem Aufblick spitzwinklig. Seitenränder und Vorderrand durchgehend schmal gerandet. Bei Blick von oben sind die Randungen der Seiten durchgehend sichtbar. Bei seitlicher Ansicht sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite wie unter Diagnose beschrieben.

Scutellum. Dreieckig, mit kleinen Punkten.

Flügeldecken. Länglich oval; quer stark gewölbt, größte Höhe etwa in der Mitte; Seiten über eine längere Strecke subparallel. Schultern entwickelt. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben schmal in der Mitte sichtbar. Auf der Oberseite nicht sehr tief eingeschnittene Striae, in denen längliche Punkte deutlich eingedrückt sind; Abstände der Punkte voneinander auf der Scheibe geringer als die Punktdurchmesser; etwa 32 Punkte in der 4. Reihe. Interstitien leicht gewölbt; auf den stark mikroretikulierten Interstitien sind bei 50-facher Vergrößerung keine Punkte sichtbar, aber winzige Härchen.

Prosternum. Vorderrand durchgehend sehr stark aufgebogen. Apophyse ziemlich schmal, annähernd parallelseitig; neben den Hüften sind die Seitenränder kaum verbreitert, aber deutlich ventrad angehoben, dadurch entsteht median eine schmale, aber deutliche Furche; hinter den Hüften ist die Apophyse etwas herabgebogen, aber weit kaudad vorgezogen; apikal verrundet. Episterna mit flachen, großen Punkten, die besonders durch ihren stark mikroretikulierten Grund auffallen.

Mesosternum. Vorderrand des hinteren Teils median nur gering ausgeschnitten; beiderseits der schmalen Mitte ist der hintere Teil gefurcht; auf dem hinteren Teil finden sich einige ungerichtet stehende, mittellange Haare.

Metasternum. Vorderrand zwischen den Mesocoxae schmal verrundet; dick gerandet; Innenrand tief eingedrückt und in den sich anschließenden, vorderen Querfurchen hinter den Mesocoxae punktiert. Hintere Querfurchen vor den Metacoxae ebenfalls tief eingedrückt und Furchen punktiert. Scheibe mit wenigen winzigen Pünktchen, die bei 50-fachen Vergrößerung an der Grenze der Sichtbarkeit liegen; aus ihnen entspringen mittellange, anliegende Haare. Mittellinie durchscheinend, nicht eingeschnitten oder eingedrückt.

Sternite. Vorderrand des 1. Sternits zwischen den Metacoxae spitzbogig, gerandet. Seitliche Querfurchen hinter den Metacoxae mit großen Punkten. Sternite glatt, mit winzigen, kaum sichtbaren, schütter stehenden Pünktchen, aus denen sehr kurze, fast anliegende Härchen entspringen. Analsternit bei ♂♂ apikomedian deutlich eingedrückt.

Fühler. Ziemlich lang; zurückgelegt kurz vor der Mitte der Flügeldecken endend. Bei beiden Geschlechtern gleich lang. 11. Antennomer stumpf zugespitzt. Die Längen und Breiten der Antennomeren 1-11 verhalten sich wie 15:7,5 / 8:6 / 22:6 / 15:6 / 17:6 / 15:6,5 / 16:8 / 14:8,5 / 14:8,5 / 13:8,5 / 18:9.

Beine. Kurz, dünn. Femora zu den zweiten Dritteln hin verdickt. Protibiae bei ♀♀ gleichmäßig gering gekrümmt; bei ♂♂ außen in der Mitte etwas abgeknickt und an den Innenseiten apikad davon stark verbreitert. Mesotibiae bei beiden Geschlechtern etwa wie die Protibiae bei ♀♀ geformt. Metatibiae etwas stärker als die Mesotibiae gekrümmt. Protarsomeren bei ♂♂ nicht verbreitert. Die Längen der Protarsomeren 1-5 sind 6:6:6:5:18, die der Mesotarsomeren 1-5 sind 16:10:6:6:18, die der Metatarsomeren 1-4 sind 39:13:7:17.

Material. Australia, NSW, Bulga Ck. 15 km NE Gilgandra, 19.12.1998, M. Baehr (1♀ ZSM); Pk. Down, ... (unleserlich) (1♂ ZSM).

Amarygmus stolidus Blackburn, 1893
Abb. 9A-H

Amarygmus stolidus Blackburn, 1893: 99.
Amarygmus lindensis Blackburn, 1893: 104 [syn. n.].

Typen. Im SAM 3 Syntypen von *Amarygmus stolidus* Blackburn an einer Nadel, davon 2 auf einem Plättchen, beide ♀♀, beim dritten ist Geschlecht äußerlich nicht zu erkennen. Sie sind etikettiert: Sydney; Co-type; (handschriftlich) *Amarygmus stolidus* Blb. N.S.W., type. Ein weiterer Syntypus, ohne Kopf und Halsschild, im NHM; etikettiert: (auf dem Plättchen, auf dem das Tier aufgeklebt ist) 4734. Syd. T; (rundes Etikett mit rotem Rand) Type; (handschriftlich) *Amarygmus stolidus* Blackb.; Blackburn Coll. 1910-236.

Holotypus von *Amarygmus lindensis* Blackburn: ♀, NHM, bezeichnet: (rundes Etikett, roter Rand) Type; (eckiges Etikett, handschriftlich, rote Tinte) 379T, P. Linc. [Port Lincoln], T; (handschriftlich) *Amarygmus lindensis* Blackb.; (gedruckt) Blackburn Coll. 1910-236.

Anmerkung. Holotypus von *lindensis* unreif, so daß die schmalen farbigen Höfe um die Punkte der Punktreihen bei dem Holotypus von *lindensis* undeutlicher als bei den Syntypen von *stolidus* sind. Abgesehen davon kann ich keine Unterschiede zwischen den Typen von *stolidus* und *lindensis* erkennen.

Diagnose. Mittelgroße Art. Länglich ovale, dunkle, etwas glänzende Flügeldecken; mit schmalerem Halsschild als Flügeldecken; auf den Flügeldecken mit Punktreihen großer, unregelmäßig stehender Punkte, die von einem rosafarbenen Hof umgeben

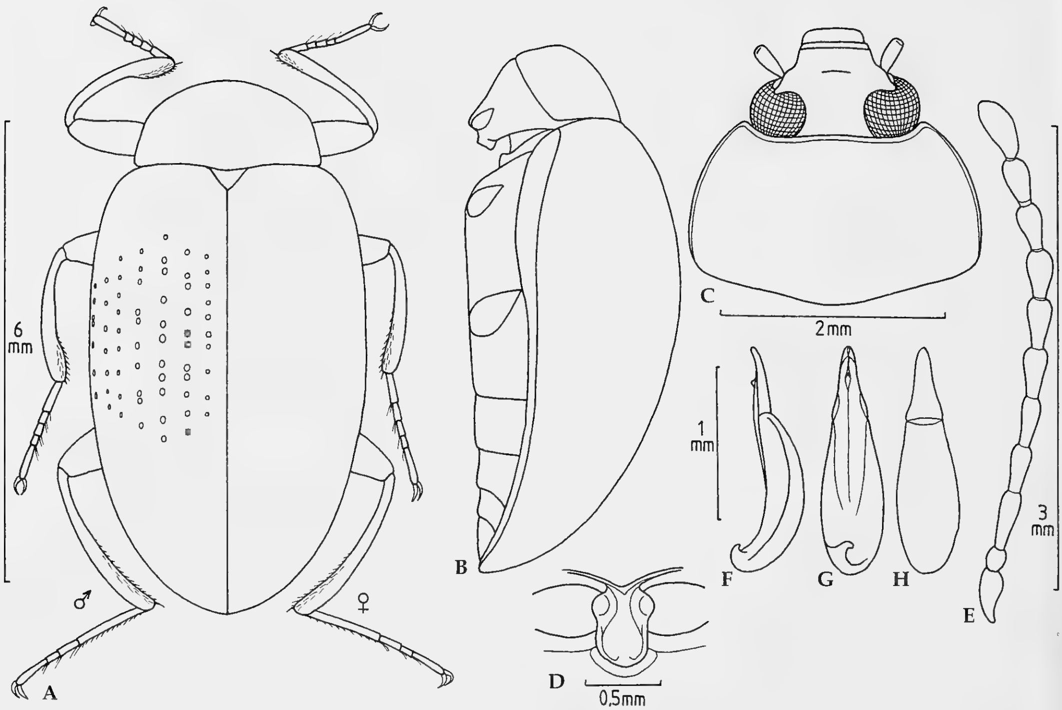

Abb. 9. *Amarygmus stolidus* Blackburn, 1893. **A.** Habitus, linksseitig Beine des ♂, rechtsseitig Beine des ♀. **B.** Körper seitlich. **C.** Kopf und Halsschild. **D.** Prosternalapophyse. **E.** Fühler. **F.** Aedoeagus seitlich. **G.** Aedoeagus ventral. **H.** Aedoeagus dorsal.

sind. Stirn ziemlich breit. Mittellange Fühler. ♂♂ haben nach innen verbreiterte Endstrecken der Protibiae. Eine ähnliche Körperform (aber andere Sexualdimorphismen an den Protibiae) hat der etwas kleinere *Amarygmus ruficornis* Blackburn; siehe dort.

Nachbeschreibung

Maße. Länge: 6,29-7,09 mm. Breite: 3,26-3,82 mm. Relationen. Halsschild: Breite/Länge 1,74-1,82; Breite Hinterecken/Breite Vorderecken 1,61-1,67. Flügeldecken: Länge/Breite 1,58-1,65; Länge Flügeldecken/Länge Halsschild 4,00-4,30; maximale Breite Flügeldecken/maximale Breite Halsschild 1,41-1,45.

Farbe. Oberseite anthracitfarben, mit metallischem Glanz, an einigen Stellen der Flügeldecken auch angedeutet bläulich; große Punkte der Punktreihen mit nicht sehr auffälligem, rosafarbenen Hof, der auch manchmal zwei bis drei benachbarte Punkte umschließen kann. Unterseite rotbraun, glänzend. Metasternum glänzend, Sternite leicht matt. Beine wie Unterseite gefärbt. Basisnahe Antennomeren hellbraun, die apikalen Antennomeren mehr dunkelbraun.

Kopf. Stirn ziemlich breit, eben, bei beiden Geschlechtern gleich breit, etwa so breit wie die Summe der Längen der 2. und 3. Antennomeren. Wangen nur angedeutet aufgebogen; nicht klar von der Stirn abgegrenzt; seitlich etwas weiter als der mittlere Teil der Stirnnaht nach vorne reichend. Stirnnaht median gering eingeschnitten, seitlich nur durchscheinend. Clypeus mittelweit vorgezogen; quer sehr gering gewölbt; Seiten verengen sich leicht nach vorne. Clypeus und Stirn fein und weitläufig punktiert. Mentum umgekehrt trapezförmig, mit breiten, glänzenden Seitenrändern; querüber dazwischen matter, nach vorne zunehmend gewölbt. Unterseite des Halses mit mikroskopisch feinen Querrillen und einigen sehr flachen Punkten. Mandibeln außen gefurcht, bifid.

Halsschild. Nicht sehr breit, quer stark gewölbt; längs leicht gewölbt. Seiten verengen sich verrundet nach vorne. Vorderrand seitlich etwas eingezogen, in der Mitte breit gerade. Vorderecken etwas vorstehend, bei orthograder Aufsicht annähernd rechtwinklig. Seitenränder und Vorderrand durchgehend gerandet. Bei Blick von oben sind die Randungen der Seiten sichtbar. Bei Ansicht von der Seite sind die Vorderecken rechtwinklig, die Hinterecken stumpfwinklig. Oberseite mit winzigen, nicht sehr dicht stehenden Punkten.

Scutellum. Dreieckig, unpunktiert.

Flügeldecken. Länglich oval; mit der größten Breite und Höhe kurz vor der Mitte, nach hinten werden die Flügeldecken deutlich schmaler. Gut ausgebildete Schulterbeulen. Enden der Flügeldecken gemeinsam verrundet. Seitenrandkanten von oben nur kurzstreckig in der Mitte, dort extrem schmal sichtbar. Auf der Oberseite Punktreihen mit großen, unregelmäßig stehenden und geformten (einige länglich) Punkten, etwa 16 Punkte in der 4. Reihe. Interstitien plan bis sehr leicht gewölbt; mit winzigen, schütter stehenden Pünktchen.

Prosternum. Vorderrand durchgehend sehr schmal aufgebogen, sehr gering zur Apophyse hin eingezogen. Apophyse mittelbreit, mit annähernd parallelen Seiten, unterbrochen nur neben den Procoxae, wo die Seitenränder fast halbkugelig verbreitert und ventrad aufgebogen sind; dazwischen eine sehr deutlich abgegrenzte Furche, die sich nach hinten bis zum Apex weitet; Seitenränder hinter den Hüften schmal, etwas angehoben; apikal breit verrundet; die mediane Fläche ist im apikalen Bereich querüber sehr leicht gewölbt und matt.

Mesosternum. Vorderrand des hinteren Teils median flach ausgeschnitten; hinterer Teil seitlich mit je einer angedeuteten Furche. Mesosternum liegt ventrad etwas höher als Vorderrand vom Metasternum.

Metasternum. Vorderrand zwischen den Metacoxae verrundet, nicht sehr stark gerandet. Vordere Abschnitte der Scheibe mit einigen großen bis – nach hinten zunehmend – kleinen Punkten, aus denen sehr kurze, anliegende Härchen (beim ♀) entspringen. Medianlinie durchscheinend, hinten angedeutet eingedrückt.

Sternite. Apophyse zwischen den Metacoxae mit annähernd geraden Seitenrändern, gerandet. Sternite mikroretikuliert, mit einigen ungerichteten Riefelungen, unpunktiert.

Fühler. Mittellang. Zurückgelegt die Flügeldecken nicht ganz bis zur Mitte überlappend. Bei beiden Geschlechtern gleich lang. 11. Antennomer apikal mit einer asymmetrischen Ecke. Die Längen und Breiten der Antennomeren 1-11 verhalten sich wie 13:7 / 7,5:6 / 18:6 / 14:6 / 14:6 / 15:7 / 16:8 / 15:8,5 / 16:8,5 / 15:8,5 / 20:9.

Beine. Femora deutlich zu den zweiten Dritteln hin keulenförmig verdickt. Protibiae bei beiden Geschlechtern außen mäßiggradig gekrümmt; innen in den apikalen Vierteln bei ♂♂ plötzlich verbreitert. Meso- und Metatibiae bei beiden Geschlechtern gekrümmt. Protarsomeren bei ♂♂ nicht verbreitert. Die Längen der Protarsomeren 1-5 sind 10:7:6:6:22, die der Mesotarsomeren 1-5 sind 20:11:8:7:23, die der Metatarsomeren 1-4 sind 46:15:10:24.

Material. Australia, NSW, Macksville, XII. 1992, leg. Wachtel (1♂, 1♀ ZSMB); dito, aber Macksville [30°45'S-152°55'E], North Arm, XII.1990, Wachtel leg. (2♀♀ ZSMB); AUS, NSW, Border Range, Blackout, 30.XII. 1989, Vr. R. Bejšák lgt. (1♂ CBj).

Amarygmus suavis Blackburn, 1893

Amarygmus cupido Pascoe, 1869: 346-347.
Amarygmus suavis Blackburn, 1893: 95 (**syn. nov.**).

Typen. Holotypus von *cupido*: ♀, NHM, etikettiert: (rundes Etikett mit rotem Rand) Type; (ovales grünes Etikett, handschriftlich) Queensland; (eckiges Etikett, weißes Papier, handschriftlich) *Amarygmus cupido* Pasc., type; (eckiges Etikett, gedruckt) Pascoe Coll. 93-60.

Holotypus von *suavis*: ♀, NHM, etikettiert: (rundes Etikett, roter Rand) Type; (rechteckiges Etikett, rote Tinte) 4739, Syd. T; (handschriftlich) *Amarygmus suavis* Blackb.; Blackburn Coll. 1910-230. Es finden sich bei dem Holotypus von *suavis* nur 9 Antennomeren des linken Fühlers und 4 Antennomeren des rechten Fühlers.

Anmerkungen. Eine Nachbeschreibung mit Abbildung von *cupido* habe ich bereits publiziert (Bremer 2005: 68). Der Holotypus von *suavis* ist zwar etwas kleiner als der von *cupido*, aber sonst stimmen alle anderen Merkmale beider Taxa überein.

Maße. Länge: 6,77-7,93 mm. Breite: 3,46-4,20 mm. Relationen. Halsschild: Breite/Länge 1,74-1,84; Breite Hinterecken/Breite Vorderecken 1,63-1,69. Flügeldecken: Länge/Breite 1,61-1,63; Länge Flügeldecken/Länge Halsschild 3,74-4,10; maximale Breite Flügeldecken/maximale Breite Halsschild 1,32-1,39.

Material. Außer den Holotypen von *cupido* und *suavis*: Australia, Qld, Brisbane Res., Browns Plain, 12,97 (1♀ ZSM).

Literatur

Blackburn, T. 1888. Further notes on Australian coleoptera, with descriptions of new genera and species. – Proc. Linn. Soc. New South Wales (Ser. 2nd) **3**: 1387-1506

–– 1892. Revision of the Australian amarygmides. – Proc. Linn. Soc. New South Wales (Ser. 2nd) **7**: 411-470

–– 1893. Revision of the Australian amarygmides. – Proc. Linn. Soc. New South Wales (Ser. 2nd) **8**: 53-106

Bremer, H. J. 2001a. Revision der Gattung *Amarygmus* Dalman, 1823 und verwandter Gattungen. I. Allgemeine Bemerkungen; Status einiger Gattungen *affine Amarygmus* Dalman; neue Kombinationen von Arten der Gattung *Amarygmus*. – Coleoptera **5**: 57-80

-- 2001b. Revision of the Genus *Amarygmus* Dalman, 1823 and Related Genera. VI. Catalogue of already described species of *Amarygmus* Dalman (Coleoptera: Tenebrionidae: Amarygmini). – Coleoptera **5**: 173-338

-- 2004. Revision der Gattung *Amarygmus* Dalman, 1823 sowie verwandter Gattungen. XXIII. Durch Blanchard, Macleay und Pic beschriebene *Amarygmus*-Arten, überwiegend der papuanischen Faunenregion; Angaben zu den Typen, Nachbeschreibungen und Abbildungen (Col., Tenebrionidae, Amarygmini). – Spixiana **27**(2): 115-128

-- 2005. Revision der Gattung *Amarygmus* Dalman, 1823 sowie verwandter Gattungen. XXVIII. Angaben zu *Amarygmus*-Arten, die von Fabricius, Weber, Wiedemann, Hope und Pascoe beschrieben wurden (Insecta, Coleoptera, Tenebrionidae, Amarygmini). – Spixiana **28**(1): 41-89

Carter, H. J. 1913. Notes and Tabulation of the Australian Amarygminae (Family Tenebrionidae), with Descriptions of New Species. – Trans. Roy. Soc. South Australia **37**: 6-47

-- 1914. Notes of Tenebrionidae in the South Australian Museum, collected by Mr. A. M. Lea, 1911-12, with descriptions of new species. – Trans. Roy. Soc. South Australia **38**: 219-238

-- 1917. Some new Heteromera, and one *Stigmodera* from tropical Australia. – Proc. Linn. Soc. New South Wales **42**: 701-719

-- 1919. Notes on Australian coleoptera, with descriptions of new species. – Proc. Linn. Soc. New South Wales **44**: 137-173

-- 1921. Australian coleoptera: notes and new species. – Proc. Linn. Soc. New South Wales **46**: 301-323

-- 1932. New Guinea and Australian coleoptera. – Proc. Linn. Soc. New South Wales **57**: 101-115

Gebien, H. 1920. Coleoptera, Tenebrionidae. Nova Guinea; Résultats de l'expedition scientifique néerlandaise à la Nouvelle-Guinée en 1912 et 1913 sous les auspices de A. Franssen Herderschee. Vol. XIII; Zoologie: 213-500, Taf. IX-XI. – E. J. Brill Verlag, Leiden

Hope, F. W. 1843. Continuation of a memoir containing descriptions of new species of *Coleoptera* from Port Essington, in New Holland. –Ann. Mag. Nat. Hist. **12**: 357-361

Kulzer, H. 1954. Achter Beitrag zur Kenntnis der Tenebrioniden (Col.). – Ent. Arb. Mus. Frey **5**: 20-73

Lea, A. M. 1910. Australian and Tasmanian coleoptera inhabiting or resorting to the nests of ants, bees, and termites. – Proc. Roy. Soc. Victoria **23** (N.S.), Pt. I: 116-225

Pascoe, F. P. 1869. XLII. Descriptions of new genera and species of Tenebrionidae from Australia and Tasmania. – Ann. Mag. Nat. Hist. Zool. Bot. Geol. **3**: 344-351

Waterhouse, C. O., C. J. Gahan& G. J. Arrow 1900. Order 4 – Coleoptera. In: A Monograph of Christmas Island (Indian Ocean). Physical Features and Geology (Ed. C. W. Andrews): 89-126. – London

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New species and new records of the genera *Dicraspeda* Chaudoir and *Eudalia* Castelnau from the Papuan and Australian regions, with a nomenclatorial note on *Deipyrus* Liebke

(Insecta, Coleoptera, Carabidae, Odacanthinae)

Martin Baehr

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As a supplement to the recent revision of the Australian Odacanthinae, four new species and three new subspecies of the odacanthine genus *Dicraspeda* Chaudoir from Australia, New Guinea, New Britain, Solomon Islands, and Halmahera are described: *D. subrufipennis*, spec. nov. related to the *brunnea*-group, from northern Australia; *D. coeruleipennis*, spec. nov., related to *D. obscura* Castelnau, from New Guinea; *D. missai*, spec. nov. and *D. glabripennis*, spec. nov., both of the *dubia*-group, from New Guinea; and *D. quadrispinosa brevipennis*, subspec. nov. from Bougainville, Solomon Islands, *D. quadrispinosa moluccensis*, subspec. nov. from Halmahera, and *D. quadrispinosa novabritannica*, subspec. nov. from New Britain. Of the genus *Eudalia* Castelnau, *E. liebherri*, spec. nov., from south-eastern Queensland is described. New records of the recently described *D. minuta* Baehr and *D. nigripes* Baehr from Papua New Guinea and several new records of the enigmatic *Eudalia anomala* Darlington from New Guinea and Halmahera are dealt with. By comparison with the Philippine *Polydamasium strandi* Liebke it proved that *E. anomala* that in many characters deviates from the genus *Eudalia* Castelnau belongs to the genus *Polydamasium*, but is not conspecific with *P. strandi*.

According to a note by Bousquet the name *Deipyrus* Liebke for an Australian odacanthine genus is preoccupied and has to be replaced in my revision by *Deipyrodes* Bousquet.

Dr. Martin Baehr, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany; e-mail: martin.baehr@zsm.mwn.de

Introduction

In parts this paper is considered a supplement to my recent revision of the Australian Odacanthinae (Baehr 2004), and it covers material which I received while the revision was already in print. The paper is mainly based on material that I sorted out from the collections of Australian National Insect Collection, Canberra (ANIC) and South Australian Museum, Adelaide (SAMA) during my recent visits to both museums, and on additional material from the Canopy mission P.N.G. received recently from Institut Royal des Sciences Naturelles de Belgique, Bruxelles (IRSNB). One new species from Australia was kindly handled over to me recently by J. Liebherr, Ithaca (CUIC), and material from the Moluccas and New Britain were kindly brought to my attention by M. Hiermeier (München), W. Lorenz, Tutzing (CLT), and A. Weigel (Pössneck). One holotype is also stored in Queensland Museum, Brisbane (QMB).

The fine series of *E. anomala* Darlington from IRSNB now enabled me to compare this species with the recorded species of the genus *Eudalia* Castelnau as well as with the genus *Polydamasium* Liebke, and to point out the actual position of this species.

Material and Methods

For the taxonomic treatment standard methods were used. The male genitalia were removed from specimens soaked for a night in a jar under wet atmosphere, then cleaned for a short while in hot KOH.

For examination of the generally fine though taxonomically highly important punctuation and microreticulation of the surface a high resolving stereo microscope with up to 64x magnification was used, supported by a lamp of high intensity giving natural light that could be focussed. For exact definition of the microsculpture such light is preferable, because fibre-glass optics substantially change the impression of the surface structures.

The habitus photographs were obtained by a digital camera using SPOT Advanced for Windows 3.5 and subsequently were worked with Corel Photo Paint 10.

Measurements were taken using a stereo microscope with an ocular micrometer. Length has been measured from apex of labrum to apex of elytra. Lengths, therefore, may slightly differ from those of other authors. Length of eye includes a small dark coloured ring of ocellae that in some instances is present behind the light area. Length of orbit is taken from posterior margin of eye to 'neck' suture. Length of head is the distance from apex of labrum to 'neck'. Length of pronotum was measured from the most advanced part of base to the most advanced part of apex; width of pronotum at widest part, including those parts of the proepisternum that are visible from above. Length of elytra was taken from the most advanced part of humerus to the most advanced apex of elytra including apical denticles, but according to the intraspecific differences in length of those spines within *D. quadrispinosa* (Chaudoir), in this species length of elytra was taken only to base of sutural spines. Ratios are somewhat variable in most species, but generally they offer rather good measures of relative shape.

Genus *Dicraspeda* Chaudoir

Dicraspeda Chaudoir, 1862: 300; Sloane 1923: 30; Csiki 1932: 1536; Liebke 1938: 88; Darlington 1968: 210; Moore et al. 1987: 274; Baehr 1996a: 138; 1997b: 30; 1998: 174; 1999: 116; 2000: 11; 2003b: 101; 2003c: 251; 2004: 148; Lorenz 1998: 420.

This genus had a rather changing history. For a time it was confounded with the related genus *Eudalia* Castelnau, and even Sloane (1917, 1923) when repeatedly revising the Australian species, was not sure to which genera the quite differently shaped Australian species should be referred. The Australian *Dicraspeda obscura* (Castelnau), for example, was referred to *Arame* Andrewes by Sloane (1923). Indeed, those species that are today combined to form the genus *Dicraspeda*, are remarkably different in their external shape and structure. When considering the species that occur in New Guinea, the problem becomes even more difficult, because then, the former genera *Philemonia* Liebke and *Macrocentra* Chaudoir have to be taken into consideration. Today these are included in *Dicraspeda* sensu lato, but certainly they again deviate in shape and structure. Some of these problems are discussed in the various papers of Baehr (see above under the genus) on Australian and New Guinean *Dicraspeda*. For the present, and because it seems not possible to maintain clear-cut subgroups within the genus, since intermediate species between most groups exist, no subgeneric units are acknowledged. At best, species could be combined to 'species-groups' that are of no nomenclatorial value (Baehr 2003c, 2004).

At present four more or less clear-cut species-groups are recognized in the genus *Discraspeda*: the *brunnea*-group that combines wide, depressed species with wide lateral pronotal sulcus and unarmed elytral apex; the *obscura*-group that includes rather convex, highly glossy species with narrow lateral pronotal sulcus, heavily punctate pronotum, and unarmed elytral apex; the *dubia*-group that equals the former genus or subgenus *Philemonia* Liebke, which includes rather compact species with narrow lateral pronotal sulcus, barely punctate pronotum, and denticulate to spinose elytral apex; and the *quadrispinosa*-group, which is similar to the former genus or subgenus *Macrocentra* Chaudoir, with two large species bearing a narrow lateral pronotal sulcus and quadrispinose elytral apex. This system of species groups could be easily transferred to subgeneric or even generic status, were it not for some species that are intermediate between these groups, as for example *D. minuta* Baehr and *D. longiloba* (Liebke) intermediate between the *brunnea*- and *dubia*-groups, and *D. brunneipennis* (Sloane) of uncertain affinities, but perhaps somewhat intermediate between the *brunnea*- and *obscura*-groups.

New Guinea apparently is the stronghold in particular of the *dubia*-group *("Philemonia")* that has achieved a very high taxonomic diversity in this island, whereas it is barely represented in Australia.

Diagnosis. This morphologically highly diverse genus is characterized by the distinct sulcus and ridge inside the eye, a distinct sulcus inside the lateral prothoracic margin, impilose elytra (except for fixed setae at 3rd interval), and generally slightly

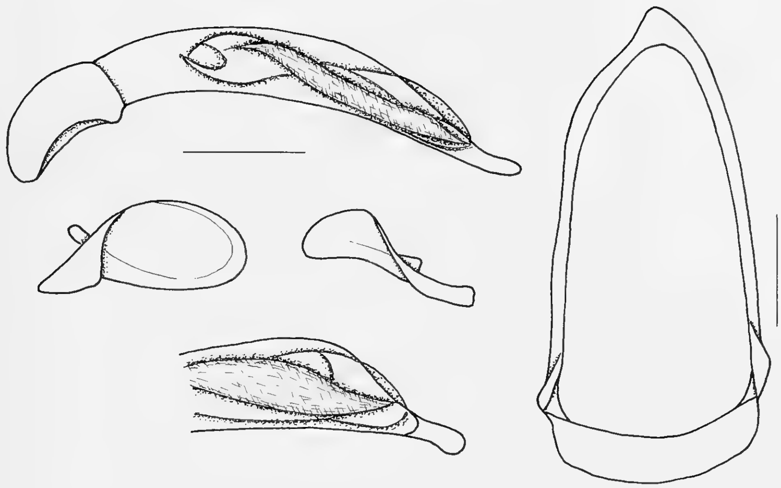


Fig. 1. *Dicraspeda subrufipennis*, spec. nov. Male genitalia: aedeagus, parameres, genital ring. Scales: 0.25 mm.

excised apex of elytra that may or may not be armed by denticles or elongate spines in very different ways.

Dicraspeda subrufipennis, spec. nov.

Figs 1, 12

Types. Holotype: ♂, Trapped by sticky seeds of *Pisonia brunoniana* Cairns dist.: F. P. Dodd (SAMA).

Diagnosis. At the first glance distinguished from all other species of its genus by minute size and the rufous elytra.

Description

Measurements. Length: 5.0 mm, width: 1.85 mm. Ratios. Length eye/orbit: 2.75; length/width of head: 1.0; length/width of pronotum: 1.10; width of head/width of pronotum: 1.10; length/width of elytra: 1.63.

Colour. Head and prothorax dark piceous, anterior part of frons, clyepus, labrum, and mandibles reddish, elytra reddish-brown. Palpi, antennae, and legs yellow. Lower surface of thorax and abdomen reddish-piceous.

Head. Large, triangular, wider than pronotum, upper surface depressed. Eyes very large, almost three times as long as orbits, laterally remarkably projecting, but not interrupting the lateral curve of the head. Orbits very oblique, gently convex, forming a distinct angle with the neck. Distance between eyes > twice as wide as diameter of eye. Clypeus separated by a fine suture that is shortly interrupted in middle, posterior part transversely convex. Labrum large, anteriorly straight, 6-setose. Mandibles and palpi of average size, mandibles anteriorly regularly incurved. Labium with elongate, triangular tooth. Frons laterally near clypeal suture with a deep, sinuate impression, in middle of frons with shallow v-shaped impression and a shallow circular groove behind. Medially of eye with an elongate sulcus and ridge. Neck separated from vertex by a shallow, transverse furrow. Posterior supraorbital seta situated slightly behind posterior margin of eye. Antennae of average size, surpassing base of pronotum by about one antennomere. Median antennomeres almost twice as long as wide. Surface of head apart from labrum without microreticulation, impunctate and impilose, highly glossy.

Prothorax. Slightly longer than wide, laterally rather convex, surface fairly depressed. Widest slightly in front of middle, margin gently rounded, but at widest diameter even very gently angulate, near basal angles feebly concave. Lateral border prominent, raised throughout, lateral margin with a deep and rather wide sulcus that considerably narrows towards apex and base. Sulcus abruptly bordered medially by a conspicuous ridge. Proepipleura and proepisternum narrowly visible from above. Apex almost straight, not bordered, anterior angles rounded off, barely visible. Base very gently convex, not bordered, posterior angles right though obtuse at apex. Median line deeply impressed, impunctate, not attaining apex nor base. Anterior transverse sulcus shallow, v-shaped, coarsely punctate, basal transverse sulcus barely impressed. Posterior marginal seta absent, anterior marginal pore and seta situated at widest part of pronotum, slightly inside of marginal border, of unknown length, because both setae broken. Surface without microreticulation, median surface rather densely, but lightly striolate, lateral sulcus, apical field, and base in middle sparsely though coarsely punctate. Disk very glossy.

Elytra. Large in comparison with fore body, more than twice as wide as prothorax, rather quadrate, though posteriorly slightly widened and lateral margin in anterior third moderately compressed. Surface depressed, disk in basal third without perceptible transverse impression. Humeri wide, almost evenly rounded. Marginal sulcus moderately wide. Apex wide, oblique, in middle moderately concave. Lateral apical angle clearly rounded, sutural angle obtuse, apical margin with coarse border line, particularly near lateral angles distinctly denticulate. All striae distinct, coarsely punctate, though even the inner ones barely impressed, intervals depressed. Punctuation becoming weaker in apical half. 3rd interval with four setiferous punctures, all situated in a slight impression. Anterior puncture situated at basal quarter and close to 3rd stria, the median puncture situated in middle of interval, the apical ones adjacent to 2nd stria. The median puncture is situated slightly behind middle of elytra, both apical ones situated close together at apical sixth of elytra. Length of setae unknown, because all broken. Marginal series of setiferous punctures consisting of 6 anterior setae behind humerus, 7 apical setae in front of lateral apical angle, one intercalar seta, and 2 setae near suture at apex. Intervals impunctate but with extremely superficial microreticulation that consists of slightly transverse meshes. Surface highly glossy. Wings fully developed.

Lower surface. Prosternum, proepisternum, proepimeron, and mesepisternum with very coarse punctures, metasternum, metepisternum, and abdomen impunctate. Metepisternum elongate, slightly $>2\times$ as long as wide. Terminal sternum in male bisetose, in middle feebly excised.

Legs. Rather elongate. 5th tarsomeres setose on lower surface, 4th tarsomeres with shallow (<⅓ of length) excision. Apex of 1st tarsomere and 2nd and 3rd tarsomeres of male anterior tarsus asymmetrically, sparsely biseriately squamose.

Male genitalia (Fig. 1). Genital ring rather narrow and elongate, slightly asymmetric, narrowed to the angulate, slightly asymmetric apex. Aedeagus slender and elongate, laterally very slightly sinuate, lower surface very gently concave. Apex rather elongate, slightly turned to the right, very gently knobbed and upturned. Internal sac rather simply folded, with an elongate, slightly coiled and gently sclerotized piece in apical half. Parameres rather dissimilar, large, fairly elongate, left larger than right.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. North-eastern Queensland. Known only from type locality.

Collecting circumstances. The holotype was "Trapped by sticky seeds of *Pisonia brunoniana*" which probably is evidence of its occurrence close to the coast. Nothing else is recorded about habits of this species.

Etymology. The name refers to the vaguely rufous colour of the elytra.

Relationships. This species clearly belongs to the *brunnea*-group within the genus *Dicraspeda*. However, in view of its minute size and striking colouration this species is quite isolated not only within the Australian species of this group but even within the whole group.

Dicraspeda coeruleipennis, spec. nov.

Figs 2, 13

Types. Holotype: ♂, NEW GUINEA, Port Moresby, (Mt. Lawes), 1300 ft. 5.3.-12.5.1963, W. W. Brandt (ANIC). – Paratype: 1♀, same data (CBM).

Diagnosis. Characterized by the coarsely punctate pronotum as being related only to the Australian *D. obscura* (Castelnau). Distinguished from this species by bluish colour of the elytra, uniformly yellow antennae and legs, shorter and wider pronotum, and less coarsely punctate elytra.

Description

Measurements. Length: 5.2-5.7 mm, width: 1.85-2.0 mm. Ratios. Length eye/orbit: 1.35-1.55; length/width of head: 1.02-1.06; length/width of pronotum: 1.28-1.31; width of head/width of pronotum: 1.06-1.14; length/width of elytra: 1.65.

Colour. Head and pronotum black, elytra with bluish-violaceous lustre. Apical part of clypeus and labrum piceous, mandibles and palpi reddish to dark yellowish, antennae and legs uniformly light yellow. Lower surfaces of fore body black, basal half of abdomen dark reddish, becoming dark piceous towards apex.

Head. Large, triangular, wider than pronotum, upper surface moderately depressed. Eyes very large, about $1.5\times$ as long as orbits, laterally remarkably projecting, though barely interrupting the lateral curve of head. Orbits very oblique, in same line with eyes, gently convex, forming a very distinct angle with neck. Distance between eyes slightly > twice as wide as diameter of eye. Clypeus separated by a fine suture that is shortly interrupted in middle, posterior part transversely convex. Labrum large, anteriorly straight, 6-setose. Mandibles and

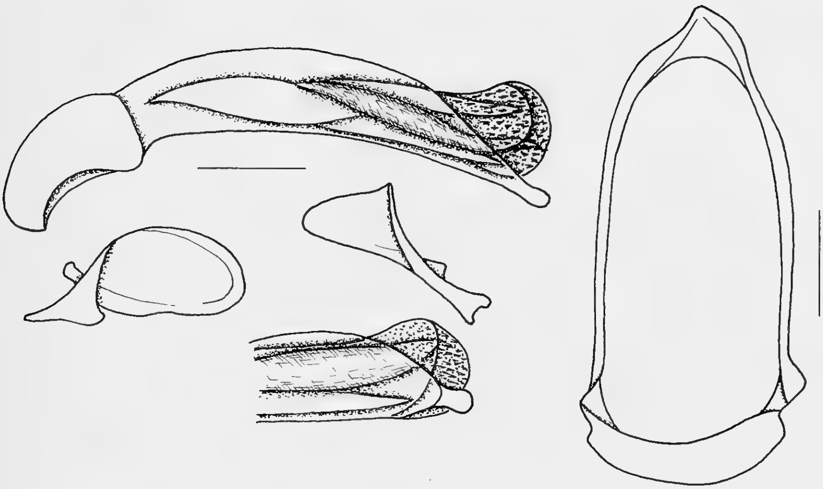


Fig. 2. *Dicraspeda coeruleipennis*, spec. nov. Male genitalia: aedeagus, parameres, genital ring. Scales: 0.25 mm.

palpi of average size, mandibles anteriorly regularly incurved. Labium with elongate, triangular tooth. Frons laterally near clypeal suture with a deep, about circular impression that is prolonged to an oblique sulcus towards eyes. In middle of frons with a shallow, v-shaped impression. Medially of eye with a distinct sulcus and sharp ridge. Neck separated from vertex by a rather deep, transverse furrow. Posterior supraorbital seta situated slightly behind posterior margin of eye. Antennae in both available specimens broken in middle, antennae elongate, probably surpassing base of pronotum by two or even three antennomeres. Median antennomeres about 3 × as long as wide. Surface of head apart from labrum without microreticulation, impunctate and impilose, highly glossy.

Prothorax. Considerably longer than wide, laterally rather convex, surface convex. Widest about in middle, margin gently rounded. Lateral border prominent, raised throughout, lateral margin with a shallow, rather indistinct sulcus that narrows towards apex and base. Sulcus not definitely bordered medially by a ridge. Large parts of proepipleura and proepisternum visible from above. Apex almost straight, not bordered, anterior angles rounded off, barely visible. Base gently convex, not bordered, posterior angles right though obtuse at apex. Median line and anterior and posterior transverse sulci absent. Both anterior and posterior marginal setae present, elongate, anterior marginal pore and seta situated slightly in front of middle, inside of marginal border, posterior seta situated right on basal angle. Surface without microreticulation, with fairly dense, extremely coarse punctures, very glossy.

Elytra. Rather large in comparison with fore body, about twice as wide as prothorax, rather quadrate, posteriorly barely widened, lateral margin in anterior third barely compressed. Surface moderately convex, on disk somewhat depressed, disk in basal third without any transverse impression. Humeri wide, almost evenly rounded. Marginal sulcus rather narrow. Apex wide, oblique, laterally moderately concave. Lateral apical angle clearly rounded, sutural angle obtuse, apex with coarse border line, particularly near lateral angles distinctly denticulate. All striae distinct, though only punctate, barely impressed, intervals depressed. Punctuation coarse, becoming remarkably weaker towards apical half. 3rd interval with three setiferous punctures, all situated in a slight impression. Anterior puncture situated at first third and close to 3rd stria, the median and apical ones adjacent to 2nd stria, the median puncture situated at posterior slightly behind middle, the apical one at apical sixth of elytra. Setae rather elongate, almost erect. Marginal series of setiferous punctures consisting of 6 anterior setae behind shoulder, 7 apical setae in front of lateral apical angles, 1 large intercalar seta, and 2 setae near suture at apex. Surface without microreticulation and impunctate, highly glossy. Wings fully developed.

Lower surface. Prosternum, proepisternum, proepimeron, and mesepisternum very coarsely punctate, metasternum, metepisternum, and abdomen impunctate. Metepisternum elongate, slightly >2× as long as wide. Terminal sternum in male bisetose, in female quadrisetose, in male in middle rather deeply excised.

Legs. Rather elongate. 5th tarsomeres setose on lower surface, 4th tarsomeres of protarsus and mesotarsus with shallow (< ⅓ of length) excision. Apex of 1st tarsomere and 2nd and 3rd tarsomeres of male anterior tarsus asymmetrically, sparsely biseriately squamose.

Male genitalia (Fig. 2). Genital ring rather narrow and elongate, slightly asymmetric, narrowed to the angulate, slightly asymmetric apex. Aedeagus slender and elongate, laterally very slightly sinuate, lower surface very gently concave. Apex rather short, slightly turned to the right, very gently knobbed. Internal sac rather simply folded, with an elongate, slightly coiled and gently sclerotized piece in apical half and a triangular, denticulate plate at orificium. Parameres rather dissimilar, large, fairly elongate, left larger than right.

Female genitalia. Very similar to those of *D. obscura* (Sloane).

Variation. Slight variation noted in punctuation of elytral striae that varies to some degree in its coarseness.

Distribution. Eastern Papua New Guinea. Known only from type locality.

Collecting circumstances. Unknown. The types were collected at rather low altitude.

Etymology. The name refers to the blue colour of the elytra.

Relationships. This species is closely related to the Australian *D. obscura* (Castelnau), but distinguished by the characters as mentioned in diagnosis.

Dicraspeda missai, spec. nov.

Figs 3, 4, 14

Types. Holotype: ♂, Coll. I.R.Sc.N.B., Canopy mission P.N.G., Madang province, Baiteta – FOG AR1, 27.IV.1995, Leg. Olivier Missa (IRSNB). – Paratypes: 2♂♂, 3♀♀, same data (CBM, IRSNB); 1♀, same locality, FOG T9, 8.VI.1993 (IRSNB).

Diagnosis. Species of the *dubia*-group, distinguished from most other species by the combination of two character states: elytra microreticulate apically in both sexes and eyes almost completely included in lateral outline of head. Distinguished from next relative *D. ullrichi* Baehr by laterally more convex pronotum and more protruding eyes.

Description

Measurements. Length: 7.3-8.3 mm, width: 2.65.-3.0 mm. Ratios. Length eye/orbit: 0.9-1.0; length/width of head: 1.02-1.09; length/width of pronotum: 1.02-1.09; width of head/width of pronotum: 1.09-1.13; length/width of elytra: 1.62-1.69.

Colour. Head and pronotum black, elytra very dark piceous, feebly lighter than fore body. Labrum with reddish-piceous margins, mandibles piceous, palpi and antenna reddish. Legs piceous with slightly lighter tarsi. Lower surface black to dark piceous.

Head. Large, triangular, wider than pronotum, upper surface rather convex. Eyes moderately large, slightly shorter than to almost as long as orbits, laterally projecting, though not interrupting the lateral curve of head. Orbits very oblique, convex, anteriorly not incurved, forming a regular curve with eyes, but a very distinct angle with neck. Distance between eyes > 3 × as wide as diameter of eye. Clypeus separated by a fine suture that is shortly interrupted in middle. Labrum large, anteriorly straight, 6-setose. Mandibles and palpi of average size, mandibles anteriorly regularly incurved. Labium with elongate, triangular tooth. Frons laterally near clypeal suture with a deep, sinuate impression that begins with a circular groove, in middle of frons with a shallow though distinct v-shaped impression, and laterally of that with a shallow, circular groove on either side halfways between impression and eye. Medially of eye with a distinct sulcus and ridge. Neck separated from vertex by a shallow, transverse furrow. Posterior supraorbital seta situated far behind posterior margin of eye. Antennae of average size, surpassing base of pronotum by almost two antennomeres. Median antennomeres about 2.5 × as long as wide. Surface of head apart from labrum without microreticulation, impunctate and impilose, highly glossy.

Prothorax. Rather short, but slightly longer than wide, laterally rather rounded, surface convex. Widest slightly in front of middle, margin gently rounded, near basal angles shortly and gently concave. Lateral border prominent, slightly raised, lateral margin with a fairly deep but narrow sulcus that even narrows towards apex and base. Sulcus not bordered medially by a definite ridge. Large parts of proepipleura and proepisternum visible from above. Apex almost straight, not bordered, anterior angles rounded off, barely visible. Base straight, not bordered, posterior angles right though obtuse at apex. Median line deeply impressed, punctate-crenulate, not attaining apex nor base. Anterior transverse sulcus very shallow, v-shaped, barely punctate, basal transverse sulcus barely impressed. Posterior marginal pore present but setae broken in almost all specimens, anterior marginal pore and seta apparently absent. Surface without microreticulation, disk barely striolate, lateral sulcus almost impunctate but opaque, apex barely punctate, only base coarsely and fairly densely punctate. Surface very glossy.

Elytra. Large in comparison with fore body,

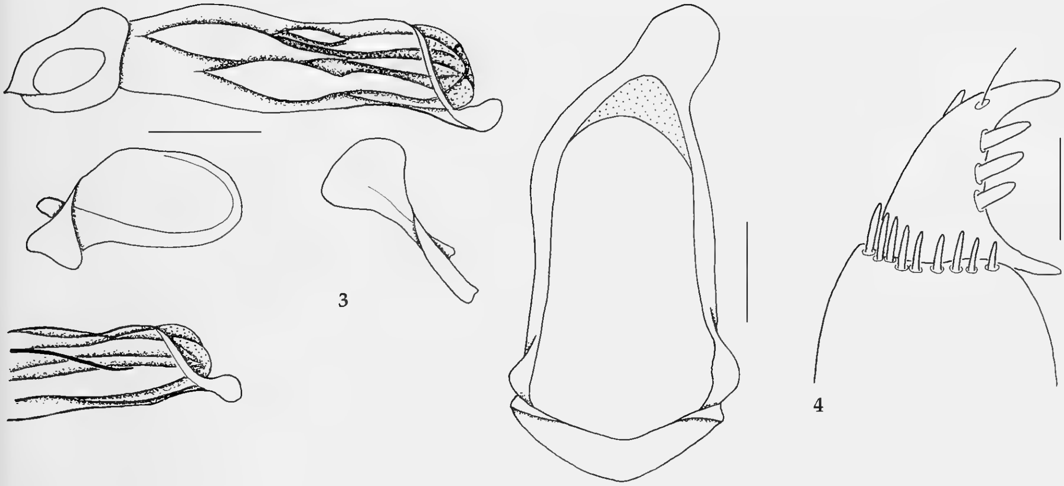


Fig. 3, 4. *Dicraspeda missai*, spec. nov. **3.** Male genitalia: aedeagus, parameres, genital ring. Scales: 0.5 mm. **4.** Female stylomeres. Scale: 0.5 mm.

more than twice as wide as prothorax, posteriorly widened and lateral margin in anterior third faintly compressed. Surface convex, disk without any transverse impression. Humeri wide, almost evenly rounded. Marginal sulcus narrow. Apex wide, oblique, sinuate and moderately concave towards lateral angles. Sutural angle with very short spine, lateral apical angle angulate, slightly produced. Apex with coarse border line, particularly in median half finely denticulate. All striae complete, slightly impressed, punctate-crenulate, intervals gently convex. Punctures of striae fairly coarse, becoming barely weaker towards apex. 3rd interval with three setiferous punctures, all situated in a slight impression. Anterior puncture situated at first third and close to 3rd stria, the median and apical ones adjacent to 2nd stria; the median puncture situated at posterior three fourths of elytra, the apical one close to apex. Setae fairly elongate (but almost all broken!). Marginal series of setiferous punctures consisting of 6 anterior setae behind shoulder, 7 apical setae in front of lateral apical angles, one intercalar seta, and two setae near suture at apex. Surface impunctate, in both sexes with highly superficial microreticulation in apical half, that consists of transverse meshes, highly glossy. Wings fully developed.

Lower surface. Pproepisternum, proepimeron, mesepisternum, and immediate base of abdomen with very coarse punctures, prosternum, metasternum, metepisternum, and most of abdomen impunctate. Metepisternum elongate, about twice as long as wide. Terminal sternum in male bisetose, in female quadrisetose, apical margin slightly excised in both sexes.

Legs. Rather elongate. All tarsomeres including 5th with dense and elongate setosity on lower surface, 4th tarsomeres with deep (> ⅔ of length) excision. Apex of 1st tarsomere and 2nd and 3rd tarsomeres of male anterior tarsus asymmetrically, sparsely biseriately squamose.

Male genitalia (Fig. 3). Genital ring rather narrow and elongate, markedly asymmetric, narrowed to the spoon-shaped, asymmetric apex. Aedeagus compact, laterally rather sinuate, lower surface markedly bisinuate and with a sharp edge in apical half. Apex short, slightly turned to the right, markedly knobbed and slightly upturned. Orificium short, internals sac fairly complexly folded, but without any sclerotized pieces. Both parameres large and convex, the right one much smaller than the left, very short.

Female genitalia (Fig. 4). Stylomere 1 with 9-10 fairly elongate ensiform setae along apical margin. Stylomere 2 moderataly elongate, evenly curved, with fairly acute apex, with one dorso-median ensiform seta in apical third, three large ventro-lateral ensiform setae along lateral margin, and one elongate nematiform seta in apical third originating from a pit.

Variation. Apart from slight variation in size and relative shape of pronotum and elytra, very little variation noted.

Distribution. Eastern Papua New Guinea. Known only from type locality.

Collecting circumstances. According to the labels fogged during a canopy fogging programme, though it is not known whether this fogging actually was

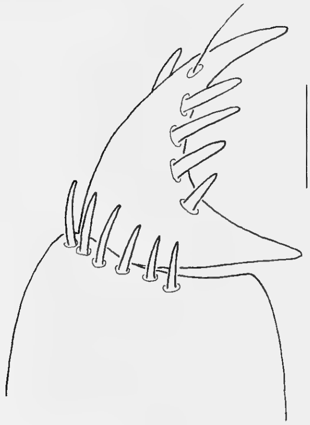


Fig. 5. *Dicraspeda glabripennis*, spec. nov. Female stylomeres. Scale: 0.5 mm.

done in the forest canopy, or on the trunks of standing trees, or on logs. Apparently, this is rather a non-hygrophilous species.

Etymology. The name honours the collector, O. Missa.

Relationships. This species belongs in the main body of the *dubia*-group and probably is closest related to *D. ullrichi* Baehr.

Dicraspeda glabripennis, spec. nov.

Figs 5, 15

Types. Holotype: ♀, INDONESIA, Irian Jaya, Nabire S Unipo, Januar 1997, leg. Frank Wolf (CBM).

Diagnosis. Species of the *dubia*-group, distinguished from most other species by the combination of absolutely glabrous elytra even in females, and laterally well produced eyes.

Description

Measurements. Length: 7.9 mm, width: 2.7 mm. Ratios. Length eye/orbit: 0.85; length/width of head: 1.27; length/width of pronotum: 1.04; width of head/width of pronotum: 1.12; length/width of elytra: 1.65.

Colour. Upper and lower surfaces uniformly black, elytra not lighter than fore body. Labrum with reddish-piceous margins, mandibles piceous, palpi and antenna reddish. Legs piceous with lighter knees and tarsi.

Head. Large, triangular, wider than pronotum, upper surface rather convex. Eyes moderately large, slightly shorter than orbits, laterally remarkably projecting, distinctly interrupting the lateral curve of head. Orbits very oblique, convex but anteriorly faintly incurved, forming a slight angle with eyes and a very distinct angle with neck. Distance between eyes >3 × as wide as diameter of eye. Clypeus separated by a fine suture that is shortly interrupted in middle. Labrum large, anteriorly straight, 6-setose. Mandibles and palpi of average size, mandibles anteriorly regularly incurved. Labium with elongate, triangular tooth. Frons laterally near clypeal suture with a deep, sinuate impression that begins with a circular groove, in middle of frons with a shallow though distinct v-shaped impression that laterally bears a sharply impressed transverse groove on either side. Medially of eye with a distinct sulcus and ridge. Neck separated from vertex by a shallow, transverse furrow. Posterior supraorbital seta situated far behind posterior margin of eye. Antennae of average size, surpassing base of pronotum by about 1.5 antennomeres. Median antennomeres almost 2.5 × as long as wide. Surface of head apart from labrum without microreticulation, impunctate and impilose, highly glossy.

Prothorax. Rather short, but slightly longer than wide, laterally rather rounded, surface convex. Widest slightly in front of middle, margin gently rounded, near basal angles shortly and gently concave. Lateral border prominent, slightly raised, lateral margin with a fairly deep but narrow sulcus that even narrows towards apex and base. Sulcus not bordered medially by a definite ridge. Large parts of proepipleura and proepisternum visible from above. Apex almost straight, not bordered, anterior angles rounded off, barely visible. Base almost straight, not bordered, posterior angles right though obtuse at apex. Median line deeply impressed, punctate-crenulate, not attaining apex nor base. Anterior transverse sulcus shallow, v-shaped, coarsely punctate, basal transverse sulcus barely impressed. Posterior marginal pore present but both setae broken in holotype, anterior marginal pore and seta apparently absent. Surface without microreticulation, disk laterally faintly striolate, lateral sulcus, apex, base and disk near median line coarsely and fairly densely punctate. Surface very glossy.

Elytra. Large in comparison with fore body, more than twice as wide as prothorax, posteriorly widened and lateral margin in anterior third faintly compressed. Surface convex, disk without any transverse impression. Humeri wide, almost evenly rounded. Marginal sulcus narrow. Apex wide, oblique, sinuate and moderately concave towards lateral angles. Sutural angle with short spine, lateral apical angle angulate, slightly produced. Apex with coarse border line, particularly in median half finely denticulate. All striae complete, well impressed, punctate-crenulate, intervals convex. Punctures of striae fairly coarse, becoming barely weaker towards apex. 3rd interval with three setiferous punctures, all situated in a slight impression. Anterior puncture situated at first third and close to 3rd stria, the median and apical ones adjacent to 2nd stria; the median puncture situated at posterior three fourths of elytra, the apical one close to apex. Setae probably elongate (only one not broken!). Marginal series of setiferous punctures consisting of 6 anterior setae behind shoulder, 7 apical setae in front of lateral apical angles, one intercalar seta, and two setae near suture at apex. Surface without microreticulation, even at apex, impunctate, highly glossy. Wings fully developed.

Lower surface. Prosternum, proepisternum, proepimeron, and mesepisternum with very coarse punctures, metasternum, metepisternum, and abdomen impunctate. Metepisternum elongate, about twice as long as wide. Terminal sternum in female quadrisetose.

Legs. Rather elongate. All tarsomeres including 5th with dense and elongate setosity on lower surface, 4th tarsomeres with deep (>⅔ of length) excision. Squamosity of male protarsus unknown.

Male genitalia. Unknown.

Female genitalia (Fig. 5). Stylomere 1 with 6 fairly elongate ensiform setae along median two thirds of apical margin. Stylomere 2 rather elongate, evenly curved, with elongate, acute apex, with one dorso-median ensiform seta in apical third, four remarkably elongate ventro-lateral ensiform setae along lateral margin, and one elongate nematiform seta in apical third originating from a pit.

Variation. Unknown.

Distribution. Central Irian Jaya. Known only from type locality.

Collecting circumstances. Unknown. This is probably a ground-living, non-hygrophilous species.

Etymology. The name refers to the absolutely glabrous elytra of this species.

Relationships. This species belongs in the main body of the *dubia*-group and in view of certain external characters probably is closest related to *D. loebli* Baehr and *D. laticollis* Baehr.

Dicraspeda quadrispinosa (Chaudoir)

Macrocentra quadrispinosa Chaudoir, 1869: 206; Csiki 1932: 1541; Liebke 1938: 100; Louwerens 1956: 223; Darlington 1968: 213; Lorenz 1998: 420.
Loxocara quadrispinosa Sloane, 1907: 180.

The nominate form of *Dicraspeda quadrispinosa* (Chaudoir) was described from Dorey, western New Guinea. Sloane described his species from north-eastern, formerly German New Guinea. The species is common in New Guinea and also occurs on New Britain, Solomon Islands, and the Moluccas. I have seen many specimens from throughout New Guinea including Salawati and Biak Islands that are quite similar in shape, proportions, punctuation of elytra, and in their male genitalia. The single available specimen from Solomon Islands, however, remarkably differs in certain external characters and proportions from the New Guinean form and thus, is described as subspecies. The available specimens from the Moluccas (Halmahera) and New Britain also differ in some external and genitalic characters and likewise seem to represent separate taxa that are also described as subspecies.

Dicraspeda quadrispinosa quadrispinosa (Chaudoir)
Fig. 6

Diagnosis. Distinguished from both, *D. q. brevipennis*, subspec. nov. and *D. novabritannica*, subspec. nov. by far less punctate lower surface; in addition from *D. q. brevipennis* by much longer and narrower elytra but slightly shorter spines, slightly coarser elytral punctuation, longer, narrower, and glossier pronotum without any traces of microreticulation, and larger eyes; from *D. q. moluccensis*, subspec. nov. by slightly less elongate and less parallel elytra, much finer elytral striae, shorter and wider pronotum, shorter head, and slightly stouter aedeagus with shorter and more club-shaped apex; and from *D. q. novabritannica*, subspec. nov. by slightly longer elytra, shorter head, shorter pronotum, and more club-shaped apex of aedeagus.

Partial redescription

Measurements. Length: 11.5-12.1 mm, width: 3.9-4.1 mm. Ratios. Length eye/orbit: 1.50-1.65; length/width of head: 0.94-0.96; length/width of pronotum: 0.92-0.94; width of head/width of pronotum: 1.16-1.18; length/width of elytra: 1.61-1.65.

Male genitalia (Fig. 6). Genital ring narrow and elongate, rather symmetric, evenly narrowed to the angulate, slightly asymmetric apex, base rather triangular. Aedeagus very slender and elongate, very slightly curved to right side, lower surface very gently concave. Apex comparatively short (in species), situated asymmetrically on right side, turned to the right, perceptibly widened to tip, hence somewhat knobbed, when seen exactly laterally from left side, rather upturned. Parameres of very different size and shape, left large, apically evenly rounded off, right narrow and elongate.

Distribution. Throughout New Guinea, including the islands to the north and west.

New records (many specimens). **PNG:** Madang, Prov. Baiteta, FOG AR67, 18.VII.1996, Leg. O. Missa (IRSNB); same locality and collector, FOG XD, 3.VI.1993 (CBM).

Relationships. In view of the almost impunctate lower surface and the moderately punctate elytral striae more closely related to *D. q. moluccensis*, subspec. nov. than to both other subspecies, but there seems to occur a west to east gradient in distinctness of punctuation of elytral striae within the nominate subspecies.

Dicraspeda quadrispinosa brevipennis, subspec. nov.

Fig. 16

Types. Holotype: ♀, SOLOMON ISLANDS, Bougainville Island, Konga Village (Buin), 6.2.-21.3.196, W. W. Brandt (ANIC).

Diagnosis. Distinguished from all other subspecies by much shorter and wider elytra with extremely elongate spines, even finer elytral punctuation, shorter, wider, and less glossy pronotum due to rather dense punctuation and traces of microreticulation, and smaller eyes. In addition distinguished from other subspecies except for *D. quadrispinosa novabritannica*, subspec. nov. by the dense punctuation of much of lower surface.

Description

Measurements. Length: 10.9 mm, width: 4.05 mm. Ratios. Length eye/orbit: 1.35; length/width of head: 0.96; length/width of pronotum: 0.87; width of head/width of pronotum: 1.13; length/width of elytra: 1.40.

Colour. As in nominate subspecies.

Head. Largely as in nominate subspecies, but eyes slightly smaller in relation to orbits.

Prothorax. Generally as in nominate subspecies, but shorter and wider, with perceptibly concave apex, denser punctuation near apex and base, and also on disk, and superficial microreticulation on disk, that together make the surface less glossier than in all other subspecies.

Elytra. Considerably shorter and wider than in all other subspecies, and more widened in apical half. Sutural spines extremely elongate, longer than in any other subspecies. Striae not all impressed, even finer punctate than in other subspecies, intervals absolutely depressed, not even convex near apex, therefore the large preapical impressions distinct.

Lower surface. Generally as in nominate subspecies, but prosternum, proepisternum, proepimeron, mesepisternum, lateral parts of metasternum, and both basal abdominal sternites with coarse and rather dense punctuation. Metepisternum slightly less elongate, c. 2 × as long as wide.

Legs. As in nominate subspecies.

Female genitalia. Very similar to those of nominate subspecies.

Variation. Unknown.

Distribution. Bougainville, Solomon Islands. Known only from type locality.

Collecting circumstances. Unknown.

Etymology. The name refers to the remarkably short and wide elytra of this subspecies.

Relationships. In view of the very fine punctuation of the elytral striae, the distinct preapical elytral depression, and the extended punctuation of the lower surface, most similar to *D. quadrispinosa novabritannica*, subspec. nov. However, as long as the male genitalia of *D. q. brevipennis* are not known, the relationships will remain unsettled.

Dicraspeda quadrispinosa novabritannica, subspec. nov.

Figs 7, 17

Types. Holotype: ♂, PNG: E New Britain Prov. 30 km SW Kokopo, 5 km SW Arabam, 04°35'75"S 152°06'84"E, 200 m, 25.II.2000, leg. A. Weigel KL (CBM).

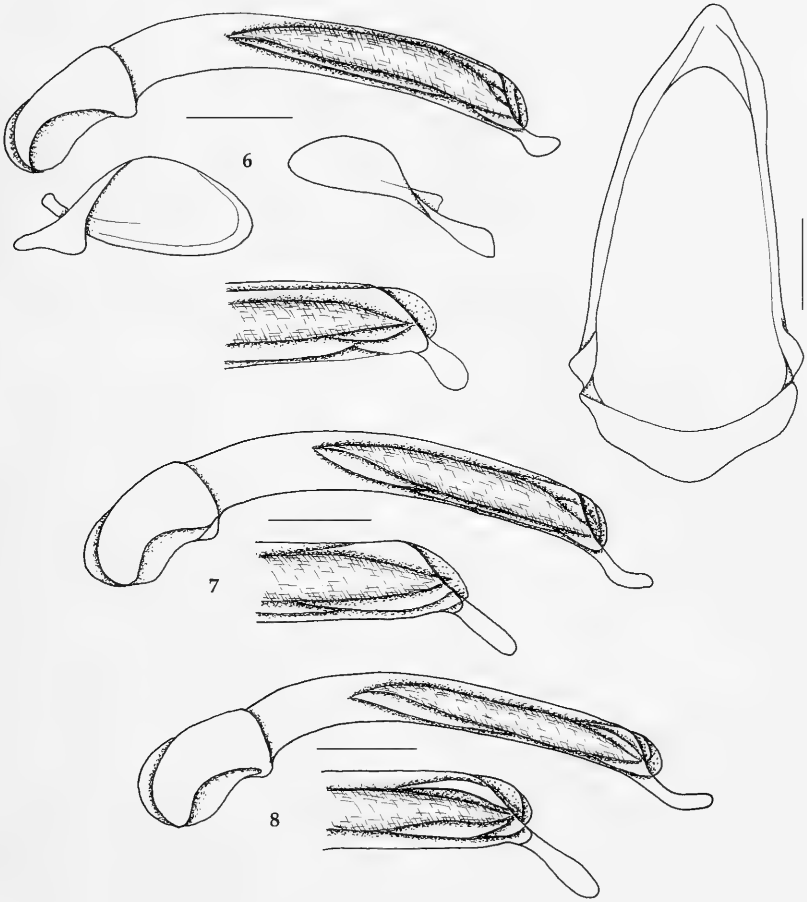
Diagnosis. Distinguished from *D. quadrispinosa brevipennis*, subspec. nov. by much longer and narrower elytra but slightly shorter spines, slightly coarser elytral punctuation, longer, narrower, and glossier pronotum without any traces of microreticulation, and larger eyes; from both other subspecies by denser punctuation of lower surface; from *D. q. quadrispinosa* also by slightly shorter elytra, longer head, longer pronotum, and less club-shaped apex of aedeagus; and from *D. q. moluccensis*, subspec. nov. by less elongate and less parallel elytra, much finer elytral striae, and slightly shorter and stouter aedeagus.

Description

Measurements. Length: 11.6 mm, width: 3.95 mm. Ratios. Length eye/orbit: 1.55; length/width of head: 1.03; length/width of pronotum: 1.01; width of head/width of pronotum:1.18; length/width of elytra: 1.65.

Colour. As in nominate subspecies.

Head. Largely as in nominate subspecies, but head longer, even longer than wide.



Figs 6-8. *Dicraspeda quadrispinosa* (Chaudoir). Male genitalia: aedeagus, parameres, genital ring. **6.** *D. q. quadrispinosa* (Chaudoir). **7.** *D. quadrispinosa novabritannica*, subspec. nov. **8.** *D. quadrispinosa moluccensis*, subspec. nov. Scales: 0.5 mm.

Prothorax. Generally as in nominate subspecies, but longer, with slightly concave apex.

Elytra. Much as in nominate subspecies, but sutural spines relatively short. Striae barely impressed, punctuation finer, intervals depressed, barely convex even near apex, therefore the large preapical impressions fairly distinct.

Lower surface. Generally as in nominate subspecies, but prosternum, proepimeron, mesepisternum, lateral parts of metasternum, and both basal abdominal sternites with rather coarse and fairly dense punctuation, proepisternum sparsely punctate.

Legs. As in nominate subspecies.

Male genitalia (Fig. 7). Much as in nominate subspecies, but apex of aedeagus longer and not at all knobbed.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. New Britain.

Collecting circumstances. Largely unknown. The mentioned specimen collected in lowland. This is probably a ground-living, non-hygrophilous subspecies.

Etymology. The name refers to the distribution of this species on New Britain.

Relationships. In view of the fine punctuation of the elytral striae, the distinct preapical elytral depression, and the extended punctuation of the lower surface, most similar to *D. quadrispinosa brevipennis*, subspec. nov. However, as long as the male genitalia of *D. q. brevipennis* are not known, the relationships will remain unsettled.

Dicraspeda quadrispinosa moluccensis, subspec. nov.

Figs 8, 18

Types. Holotype: ♂, 20.5.-2.6.1997, Indonesia, N. Moluccas, NO Halmahera, Umg. Labi Labi ca. 5 km östlich, 0-200 m, leg. M. Hiermeier, N 01°27.606', E 128°22.045') (CBM). – Paratypes: 1♂, same data (CBM); 1♂, Indonesia: Halmahera, Wangonira (petromax), ca. 01.37 N 127.51 E, W. Lorenz, 28.3.1995 (CLT).

Diagnosis. Distinguished from both, *D. q. brevipennis*, subspec. nov. and *D. novabritannica*, subspec. nov. by far less punctate lower surface; in addition from *D. q. brevipennis* by much longer and narrower elytra but slightly shorter spines, coarser elytral punctuation, longer, narrower, and glossier pronotum without any traces of microreticulation, and larger eyes; from *D. q. quadrispinosa* by slightly longer elytra, longer head, longer pronotum, and longer aedeagus with less club-shaped apex; and from *D. q. novabritannica*, subspec. nov. by longer and more parallel elytra, much coarser elytral striae, and even slightly longer aedeagus.

Description

Measurements. Length: 10.2-11.9 mm, width: 3.5-3.9 mm. Ratios. Length eye/orbit: 1.50-1.55; length/width of head: 0.98-1.0; length/width of pronotum: 0.98-1.0; width of head/width of pronotum: 1.17-1.19; length/width of elytra: 1.70-1.72.

Colour. As in nominate subspecies.

Head. Largely as in nominate subspecies, but head longer.

Prothorax. Generally as in nominate subspecies, but longer, with slightly concave apex.

Elytra. Much as in nominate subspecies, but longer and more parallel. Sutural spines relatively short. Striae more impressed than in any other subspecies, intervals distinctly convex near apex, hence, the preapical impression indistinct. Punctuation coarser, very distinct even near apex.

Lower surface. As in nominate subspecies, impunctate except for mesothorax and lateral parts of proepisternum.

Legs. As in nominate subspecies.

Male genitalia (Fig. 8). Much as in nominate subspecies, but aedeagus even longer and narrower, apex much longer and but very slightly widened.

Female genitalia. Unknown.

Variation. Little variation noted, except for length of sutural spines that are exceptionally short in one specimen, not seen elsewhere in the numerous material of this species examined.

Distribution. Halmahera, Moluccas.

Collecting circumstances. One specimen apparently collected at light. This is probably a ground-living, non-hygrophilous. lowland subspecies.

Etymology. The name refers to the distribution of this species on the Moluccas.

Relationships. In view of the almost impunctate lower surface and the coarse punctuation of the elytral striae more closely related to the nominate subspecies, than to both eastern subspecies, but the elongate apex of the aedeagus well differentiates this subspecies from the nominate form.

Dicraspeda nigripes Baehr

Baehr, 2003c: 258; 2004: 192.

New records (2 ex.). **PNG:** Madang, Prov. Baiteta, FOG AR67, 18.VII.1996, Leg. O. Missa (IRSNB); same locality and collector, FOG XD, 3.VI. 1993 (CBM).

Note. According to the collecting records on the labels, both additional specimens probably were sampled by fogging, but without exact record, whether this was done in the canopy, or on lower branches, or on fallen logs. At any rate, this species seems to live in rain forest, without being decidedly hygrophilous.

One specimen has an exceptionally wide, laterally convex pronotum. In other respects, including shape and structure of the aedeagus, it is similar to the type series of *D. nigripes* and apparently represents only an individual variation.

Dicraspeda minuta Baehr

Baehr, 1998: 176; 2004: 192.

New records (2 ex.). **PNG:** Madang prov. Baiteta, FOG AR4, 5.V.1995, leg. O. Missa (IRSNB); same locality, FOG AR62, 3.VII.1996 (CBM).

Note. This is a species which is not easily arranged in one of the species groups mentioned above, because in certain aspects it is intermediate between the *brunnea*- and *dubia*-groups.

According to the collecting records on the labels, both additional specimens probably were sampled by fogging, but without exact record, whether this was done in the canopy, or on lower branches, or on fallen logs. At any rate, this species seems to live in rain forest, without being decidedly hygrophilous.

Key to the species of the genus *Dicraspeda* Chaudoir

In view of the number of new taxa described in this paper, a completely new key to the species of the genus *Dicraspeda* is presented that combines three rather recent keys: that for the Australian species (Baehr 2004), that for the species of the *brunnea*-group (Baehr 2003c), and that for the extra-Australian species (Baehr 1998). For better comparison, figures from Baehr (1996a) are included as "**B96a** fig." in text.

1. Apex of elytra not denticulate or spinose ....2.
– Apex of elytra denticulate or spinose .... 18.

2. Body striking bicolourous: head and pronotum deep black, elytra rufous; size minute, length c. 5 mm. Northern Queensland .... *subrufipennis*, spec. nov.
– Body more or less unicolourous: uniformly black or dark piceous, at most elytra piceous; size major, length >5.5 mm, in species with dark piceous elytra length >7.5 mm........................ 3.

3. 4th tarsomere of metatarsus emarginate for less than ⅓ of its length ....4.
– 4th tarsomere of metatarsus emarginate for more than ⅔ of its length. New Guinea, northern Queensland .... *longiloba* (Liebke)

4. Marginal sulcus of pronotum wide, markedly explanate; surface of pronotum rather depressed; elytra wide, rather quadrate, depressed..........5.
– Marginal sulcus of pronotum narrow and not explanate; surface of pronotum rather convex; elytra less wide, convex .... 15.

5. Legs wholly or in parts piceous to black.........6.
– Legs completely yellow.................................... 8.

6. Lateral apical angles of elytra sharply angulate; surface of elytra in basal third without distinct transverse impression, with superficial, though distinct microreticulation ....7.
– Lateral apical angles of elytra rounded; surface of elytra in basal third with distinct transverse impression, without perceptible microreticulation. Papua New Guinea.............*nigripes* Baehr

7. Elytra in apical half not markedly widened, apex less deeply excised; striae less coarsely punctate. Solomon Islands: Rennell Island........................ ....*inermis* Louwerens
– Elytra in apical half considerably widened, apex deeply excised; striae more coarsely punctate. Moluccas ....*angulipennis* Baehr

8. Striae deeply impressed, intervals clearly convex (doubtful species under both couplets) ....9.
– Striae not impressed, intervals depressed.... 11.

9. Striae less deeply impressed, intervals near base gently convex, in apical half depressed; surface of elytra with superficial microreticulation; orbits more oblique, less transversal. New Hebrides (Vanatua) ....*hebridarum* Baehr
– Striae deeply impressed, intervals convex almost towards apex; surface of elytra with distinct microreticulation; orbits less oblique, more transversal. Distribution different .... 10.

10. Surface of elytra more convex, striae more coarsely punctate; surface of elytra in basal third with perceptible transverse impression, apex of elytra little excised, lateral apical angles obtuse. Indonesia, Philippines, southern Thailand .... *brunnea* Chaudoir
– Surface of elytra more depressed, striae less coarsely punctate; surface of elytra in basal third without perceptible transverse impression, apex of elytra deeply excised, lateral apical angles angulate. Northern Australia .... *sublaevis* (Macleay)

11. Surface of elytra in basal third without perceptible transverse impression, with superficial though distinct microreticulation ....12.
– Surface of elytra in basal third with distinct transverse impression, without perceptible microreticulation .... 13.

12. Punctures of elytral striae basally coarser, intervals near base slightly convex; orbits more oblique, less transversal. New Hebrides (Vanatua)..*hebridarum* Baehr
– Punctures of elytral striae basally finer, intervals also near base depressed; orbits more transversal, less oblique. Northern Queensland .... *nitida* (Sloane)

13. Striae with very fine punctuation, punctures becoming obsolete towards apex; lateral apical angle of elytra angulate; orbits longer, more oblique. Irian Jaya: Biak Is. ....*obsoleta* Baehr
– Striae with coarser punctuation, punctures distinct towards apex; lateral apical angle of elytra obtuse; orbits shorter, more transversal. Distribution different .... 14.

14. Pronotum generally shorter and wider, ratio l/w 1.05-1.09; elytra shorter on the average, ratio l/w 1.47-1.50; apex of elytra more deeply excised, base with barely perceptible transverse impression. Northern Queensland .... *glabrata* Baehr

– Pronotum generally longer and narrower, ratio l/w 1.08-1.13; elytra shorter on the average, ratio l/w 1.51-1.53; apex of elytra less deeply excised, base with distinct transverse impression. Papua New Guinea .... *papuensis* Baehr

15. Pronotum completely and very coarsely punctate .... 16.

– Pronotum only at base and apex punctate, punctuation less coarse .... 17.

16. Elytra black; legs yellow with dark knees; antennae infuscate from mid of 4th antennomere; pronotum longer and narrower, ratio l/w > 1.38. Northern Australia .... *obscura* (Castelnau)

– Elytra with distinct bluish lustre; legs and antennae unicolourous yellow; pronotum shorter and wider, ratio l/w < 1.32. Papua New Guinea .... *coeruleipennis*, spec. nov.

17. Elytra rather wide and depressed, with distinct transverse impression in basal third; striae not impressed, punctuation rather fine; legs reddish-piceous; elytra not lighter than fore body. Papua New Guinea .... *minuta* Baehr

– Elytra rather narrow and convex, without transverse impression; striae well impressed, punctuation coarse; legs yellow; elytra conspicuously lighter than fore body. Northern Queensland .... *brunneipennis* (Sloane)

18. Apex of elytra denticulate or spinose at sutural angle only .... 19.

– Apex of elytra bispinose, with elongate spines at sutural and lateral angles .... 27.

19. 4th tarsomere of metatarsus emarginate for < ½ of its length only; eyes large, slightly longer than orbits. New Guinea, ? northern Queensland .... *dubia* (Gestro)

– 4th tarsomere of metatarsus emarginate for ⅔ of its length or more; eyes smaller, shorter than orbits .... 20.

20. Outline of orbit and eye forming a regular curve which is not interrupted behind eye (Fig. 14; **B96a** fig. 10); aedeagus compact, large near apex, apex turned up, angle between lower surface of aedeagus and apex inconspicuous (Fig. 3; **B96a** fig. 6) .... 21.

– Outline of orbit and eye not forming a regular curve, outline interrupted behind eye (**B96** figs 8, 9); aedeagus different, when compact, then angle between lower surface of aedeagus and apex conspicuous (**B96a** fig. 4) .... 22.

21. Eyes laterally absolutely not protruded, width of head over eyes not much wider than over orbits (**B96a** fig. 10). Papua New Guinea........... .... *ullrichi* Baehr

– Eyes laterally protruded, width of head over eyes considerably wider than over orbits (Fig. 14). Papua New Guinea.......... *missai*, spec. nov.

22. Elytra piceous, slightly lighter than fore body.. .... 23.

– Elytra black, not lighter than fore body........ 24.

23. Sutural spines elongate; microreticulation of elytra in female complete, in male distinct at least in apical half; intervals barely convex; aedeagus wider at apex, lower surface markedly bisinuate, angle between lower surface and apex conspicuous, lateral surface rough. Papua New Guinea .... *bispinosa* Darlington

– Sutural spines shorter; microreticulation of elytra in female visible only in apical half, in male almost completely absent; intervals distinctly convex; aedeagus narrower at apex, lower surface evenly concave, angle between lower surface and apex barely indicated, lateral surface smooth. Papua New Guinea .... *loebli* Baehr

24. Sutural angle of elytra denticulate **and** lateral angle obtusely angulate. Irian Jaya .... *denticulata* Baehr

– Sutural angle of elytra spinose or denticulate, but when denticulate, lateral angle sharply angulate .... 25.

25. Pronotum longer and narrower, ratio l/w > 1.07; elytra longer and narrower, barely widened in apical third, ratio l/w > 1.7 (from humerus to base of sutural spines). Vogelkop Peninsula, western Irian Jaya......................... *intermedia* Baehr

– Pronotum shorter and wider, ratio l/w < 1.03; elytra shorter and wider, distinctly widened in apical third, ratio l/w < 1.6 (from humerus to base of sutural spines) .... 26.

26. Pronotum at apex and base more extensively punctate; in female elytra with distinct traces of microreticulation, at least in apical half. Japen Island and New Britain .... *laticollis* Baehr

– Pronotum at apex and base rather sparsely punctate; in female elytra without any traces of microreticulation, highly glossy. Irian Jaya .... *glabripennis*, spec. nov.

27. Colour green-purple; tarsi not sulcate-carinate above. New Guinea, New Britain .... *violacea* (Sloane)

– Colour black; tarsi sulcate-carinate above......... .... *quadrispinosa* (Chaudoir) 28.

28. Elytra longer and narrower, ratio l/w > 1.6 (from humerus to base of sutural spines), sutural spines shorter (Figs 17, 18); pronotum longer and narrower, ratio w/l > 0.92, with barely excised apex; surface of pronotum glossier, without any microreticulation. New Guinea, New Britain, Halmahera ....29.

– Elytra shorter and wider, ratio l/w 1.4 (from humerus to base of sutural spines), sutural spines very elongate (Fig. 16); pronotum shorter and wider, ratio l/w 0.87, with more deeply excised apex; surface of pronotum less glossy, with traces of microreticulation. Solomon Islands: Bougainville ....*quadrispinosa brevipennis*, subspec. nov.

29. Head and pronotum longer, ratios l/w head and l/w pronotum >0.98; aedeagus with longer, barely knobbed apex (Figs 7, 8) ....30.

– Head and pronotum shorter, ratios l/w head <0.96, l/w pronotum <0.94; aedeagus with shorter, distinctly knobbed apex (Fig. 6). New Guinea including adjacent islands ....*quadrispinosa quadrispinosa* (Chaudoir)

30. Elytra longer, ratio l/w > 1.70 (from humerus to base of sutural spines), punctuation of striae rather coarse; aedeagus slenderer (Fig. 8). Halmahera .... *quadrispinosa moluccensis*, subspec. nov.

– Elytra shorter, ratio l/w <1.65 (from humerus to base of sutural spines), punctuation of striae very fine; aedeagus slightly less slender (Fig. 7). New Britain .... *quadrispinosa novabritannica*, subspec. nov.

Genus *Eudalia* Castelnau

Eudalia Castelnau, 1867: 16; 1868: 102; Sloane 1917: 415; 1923: 30; Csiki 1932: 1542; Darlington 1968: 214; Moore et al. 1987: 273; Lorenz 1998: 421; Baehr 1999: 116; 2003b: 101; 2004: 151.

Note. *Eudalia* seems to be a genus of convenience which includes quite differently shaped and structured species that are combined more by plesiomorphic than by apomorphic features. Apparently it is confined to Australia, because the single extra-Australian species *E. anomala* Darlington actually belongs to another genus (see below). *Eudalia* is composed of two well separated lineages, namely the *obliquiceps*-lineage that comprises rather elongate, impilose or scarcely pilose species bearing smaller, less protruding eyes, and the *macleayi*-lineage that comprises short, compact, densely pilose species with large, protruding eyes and short, remarkably convex orbits.

Eudalia liebherri, spec. nov.

Figs 9, 19

Types. Holotype: ♂, Australia: Q. Canungra Ck. S Canungra el. 150 m 28°04.40'S 153°06.75'E 20-VIII-2004 J. K. Liebherr under rocks in streambed (QMT123682). – Paratype: 1♂, same data (CUIC).

Diagnosis. Characterized by sharing of uniformly black colour, absence of pilosity on the elytra but presence of fine microreticulation, uniformly piceous legs, and absence of setiferous punctures from 5th interval. Distinguished from most closely related *E. atrata* Baehr by lesser size, slightly smaller eyes, and upturned apex of aedeagus.

Description

Measurements. Length: 8.6-8.8 mm, width: 3.05-3.10 mm. Ratios. Length eye/orbit: 1.15-1.20; length/width of head: 1.12-1.13; length/width of pronotum: 1.26-1.28; width of head/width of pronotum: 1.16-1.18; length/width of elytra: 1.67-1.71.

Colour. Surface black, labrum with piceous margins, palpi reddish, antenna dark, becoming slightly lighter towards apex. Legs dark piceous, only tarsi reddish towards apex.

Head. Fairly wide. Neck moderately narrow, with rather deep transverse impression. Eyes fairly large, laterally moderately protruding, slightly separated from orbits which are slightly shorter than eyes and gently convex. Behind clypeus with fairly deep, elongate, somewhat sinuate groove, and in middle of frons with a shallow v-shaped groove. Medially of eye with a slight sulcus that extends to about middle of eye, but without ridge. Posterior supraorbital seta located well behind posterior margin of eye and moved on vertex. Labrum elongate, 6-setose. Clypeus not separated from frons. Mentum with rather elongate, acute, triangular tooth, with 2 setae behind tooth, submentum with a very elongate and a short seta on either side. Apex of glossa transverse, with 2 elongate median and 2 shorter lateral setae. Paraglossae free, narrow, surpassing glossy. Lacinia elongate, interior margin with a sparse fringe of spines. Antenna elongate, surpassing base of pronotum by about one antennomere, pilose from middle of 4th antennomere. Median antennomeres > 3 × as long as wide. Surface glossy, without microreticulation, glabrous, with a group of rather coarse punctures medially of eyes.

Prothorax. Moderately elongate, laterally little

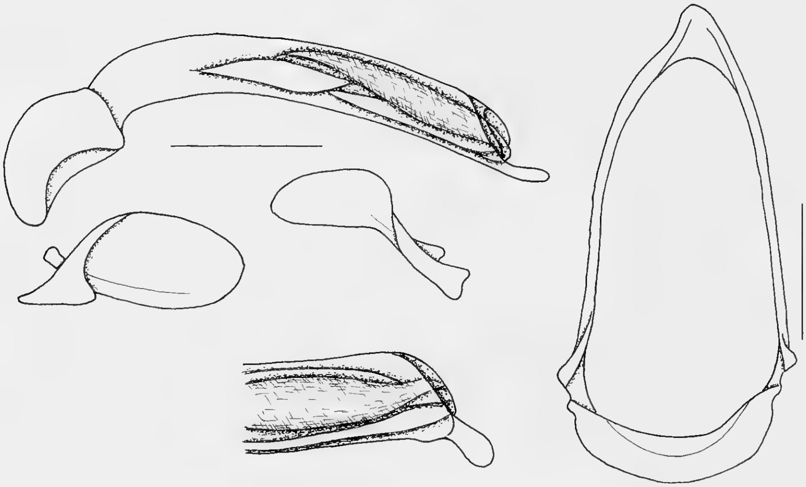


Fig. 9. *Eudalia liebherri*, spec. nov. Male genitalia: aedeagus, parameres, genital ring. Scales: 0.5 mm.

convex, dorsal surface convex. Widest slightly in front of middle, margin gently rounded, near basal angles gently concave. Lateral border prominent, slightly raised, but lateral margin without any sulcus or ridge. Proepipleura narrowly visible from above. Apex straight, not bordered, anterior angles rounded off. Base straight, not bordered, posterior angles right though obtuse at apex. Median line very shallow, not attaining apex nor base. Anterior transverse sulcus shallow, v-shaped, barely punctate, basal transverse sulcus barely impressed. A single marginal seta situated just in front of middle, seta elongate. Disk in basal half densely and coarsely punctate, the punctures tend to form irregular transverse sulci. Apical half impunctate, but with inconspicuous transverse strioles. Surface without microreticulation, impilose, glossy.

Elytra. Large in comparison with fore body, more than twice as wide as prothorax, posteriorly widened, lateral margin evenly convex without any excision in anterior third. Surface gently convex, disk without any transverse impression. Humeri wide, almost evenly rounded. Marginal sulcus narrow. Apex wide, oblique and very slightly concave. Sutural angle unarmed, lateral apical angles evenly rounded. Apex with coarse border line, not denticulate. Scutellar stria elongate, consisting of about 8 coarse punctures. All striae complete, well impressed, punctate-crenulate, intervals gently convex. Punctures of striae fairly coarse in basal half, becoming remarkably weaker towards apex. 3rd interval with 5 setiferous punctures, all situated in a slight impression. Three anterior punctures situated in middle of 3rd interval, the apical apical ones adjacent to 2nd stria. Setae moderately elongate. Marginal series of setiferous punctures consisting of 6 anterior setae behind shoulder, 7 apical setae in front of lateral apical angles, one intercalar seta, and two setae near suture at apex. Surface with distinct, almost isodiametric microreticulation, impunctate, moderately glossy. Wings fully developed.

Lower surface. Thorax and basal half of abdomen with very coarse and moderately dense punctuation. Apical half of abdomen impunctate. Metepisternum elongate, c. 2.5 × as long as wide at apex. Terminal abdominal sternum in male bisetose.

Legs. Of moderate size. Tarsi not lobed, impilose on upper surface, 5th tarsomere with a dense fringe of elongate setae below. Claws large, smooth. 1st-3rd tarsomeres of male anterior tarsus with sparse squamosity.

Male genitalia (Fig. 9). Terminal abdominal sternite in middle gently incised. Genital ring fairly narrow and elongate, moderately triangular, barely asymmetric, with narrow, triangular apex. Aedeagus slender and elongate, moderately depressed, laterally little sinuate, lower surface near base concave, in apical half almost straight. Orificum short. Apex short, fairly narrow, very slightly upturned, gently knobbed, turned to right, moderately incised at right side. Folding of internal sac simple, with an elongate, slightly coiled, moderately sclerotized piece in apical half. Parameres moderately dissimilar, large, comparatively elongate, left paramere larger than right.

Female genitalia. Unknown.

Variation. Very slight variation noted in punctuation of elytral striae that varies to some degree in its coarseness.

Distribution. South-eastern Queensland, Australia. Known only from type locality.

Collecting circumstances. Collected "under rocks in streambed". According to these information, this is a ripicolous species like other species of the genus *Eudalia*.

Etymology. The name honours the collector of this species, Prof. James Liebherr, Ithaca.

Relationships. According to shape and colouration, this species is most closely related to *E. atrata* Baehr, which however, is larger and apparently is restricted to the Barrington Tops area in central New South Wales.

Recognition

The new species is easily introduced in the recent key to the genus *Eudalia* (Baehr 2004: 165). When using the key, the reader will reach caption 8. which has to be changed as following:

8. Legs uniformly dark; elytra wider, posteriorly distinctly widened, ratio l/w <1.70; intervals more depressed, barely convex towards apex; striae more coarsely punctate, microreticulation of intervals distinct...8a.
– Legs dark but upper surface of femora light reddish, contrasting; elytra narrower, almost parallel, ratio l/w 1.76; intervals convex throughout; striae less coarsely punctate, microreticulation of intervals more superficial. NSW, Orange, west of Blue Mountains...............*femorata* Baehr

8a. Size slightly larger, length >9.3 mm; apex of aedeagus straight, moderately directed to right side (**B04** fig. 15). NSW, Vicinity of Barrington Tops..*atrata* Baehr
– Size slightly smaller, length <8.7 mm; apex of aedeagus slightly upturned, markedly directed to right side (Fig. 9). se. QLD, north of Lamington Plateau............................*liebherri*, spec. nov.

Genus *Polydamasium* Liebke

Polydamasium Liebke, 1938: 86; Donabauer 1996: 1; Lorenz 1998: 418.

Note. This is a little known genus that had not been noted in the literature since its description, because the types of the single Philippine species *Polydamasium strandi* Liebke were destroyed during World War II. Although Jedlicka (1963) examined a large number of Philippine species, he did not mention it, because apparently reliable material from the type locality or even from the range of this species was not available to him. Apparently the genus and species was also unknown to Darlington (1968). More recently, M. Donabauer collected a large series of specimens on which he redescribed the genus and species and designated a neotypus for *P. strandi* Liebke from this series (Donabauer 1996). Grace to his kindness I was able to examine two specimens and to confirm Donabauer's decision.

In spite of some external similarities of both presently recorded species with certain species of the genus *Eudalia*, *Polydamasium* certainly is rather remotely related to *Eudalia*, which can be taken as well from the different structure of the male aedeagus, as the female stylomeres.

Polydamasium anomalum (Darlington) (comb. nov.)

Figs 10, 11, 20

Eudalia anomala Darlington, 1968: 214; Lorenz 1998: 421; Baehr 2004: 192.

Note. This species was only tentatively included in the genus *Eudalia* already by Darlington (1968) when he described it. Indeed, it is quite different from all Australian *Eudalia* and would represent the single extra-Australian species of that genus. During preparation of the present paper, and in the course of my comparison of *E. anomala* with other Indo-australian odacanthine genera, Mr. M. Donabauer in a determination sample kindly sent two specimens of his series of *Polydamasium strandi* Liebke mentioned above which enabled me to compare both species. This comparison now revealed that they certainly belong in the same genus, but are not conspecific. Main differences are noted in the key below.

Diagnosis. With characters of *Polydamasium* as described in Donabauer (1996). Compact species with short and large, laterally markedly rounded head, and large eyes; no ridge mediad of eye; surface glabrous, impunctate; pronotum rather short, laterally margined but without lateral sulcus; surface glabrous, punctate only near base; Elytra rather short and wide, without denticles or spines at apex; striae present, fairly coarsely punctate in basal half, barely punctate towards apex, not impressed; 3rd stria with three setiferous punctures; apex slightly excised, lateral apical angles more or less angulate, but never evenly rounded; upper surface of tarsi glabrous; 4th tarsomeres slightly excised, but not lobate; claws glabrous; aedeagus elongate, depressed,

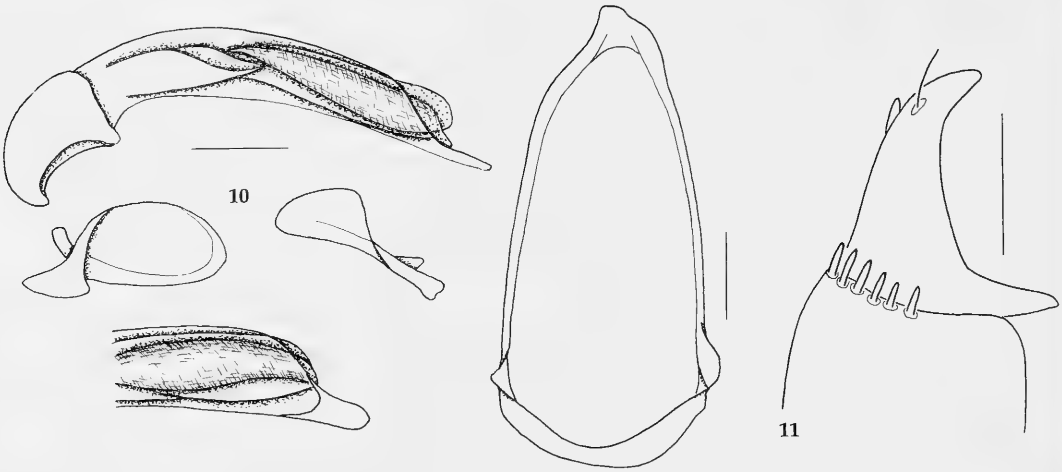


Fig 10-11. *Polydamasium anomalum* (Darlington). **10.** Male genitalia: aedeagus, parameres, genital ring. Scales: 0.25 mm. **11.** Female stylomeres. Scale: 0.1 mm.

curved, slightly asymmetric, orificium short, without any sclerotized pieces within, apex fairly elongate, turned to right side.

Partial redescription

Measurements. Length: 6.3-6.7 mm, width: 2.30-2.35 mm. Ratios. Length eye/orbit: 1.25-1.45; length/width of head: 1.06-1.12; length/width of pronotum: 1.09-1.14; width of head/width of pronotum: 1.12-1.15; length/width of elytra: 1.61-1.64.

Male genitalia (Fig. 10). Genital ring rather narrow and elongate, rather symmetric, slightly narrowed to the angulate, slightly asymmetric apex. Aedeagus slender and elongate, laterally barely sinuate, lower surface very gently concave. Apex rather elongate, straight, depressed, situated on right side, neither knobbed nor upturned. Internal sac rather simply folded, with a large, somewhat coiled and moderately sclerotized piece in apical half. Parameres moderately dissimilar, rather large, moderately elongate, left larger than right.

Female genitalia (Fig. 11). Very small, apical margin of stylomere 1 with c. 6 rather short ensiform setae; stylomere 2 narrow, elongate, little curved towards the short apex; without any ventro-lateral ensiform setae, with a dorso-median ensiform seta situated in apical third, and an elongate nematiform seta near apex arising from a pit.

In contrast to the male, the female terminal abdominal sternite bears a rather dense pilosity at its apical margin.

New records (many specimens). **PNG**: Madang Prov. Sisimangum Village, 15.VI.1979, leg. Van Goethem (CBM, IRNSB). – **IJ:** W-Papua, Raja Ampat Prov. Yensavai, Batanta bor., 0°48'05"S 130°40'36"E, 16.I.2004, leg. A. Weigel (CBM); W-Papua, Raja Ampat Prov. Batanta Isl. mer, Wailebet, 0°54'01"S 130°39'37"E, 18.-21.I.2004, leg. A. Skale (CBM). – **Indonesia:** Halmahera, Tobelo (hotel), 01.43N 128.00.30E, 23.3.1995, W. Lorenz (CLT).

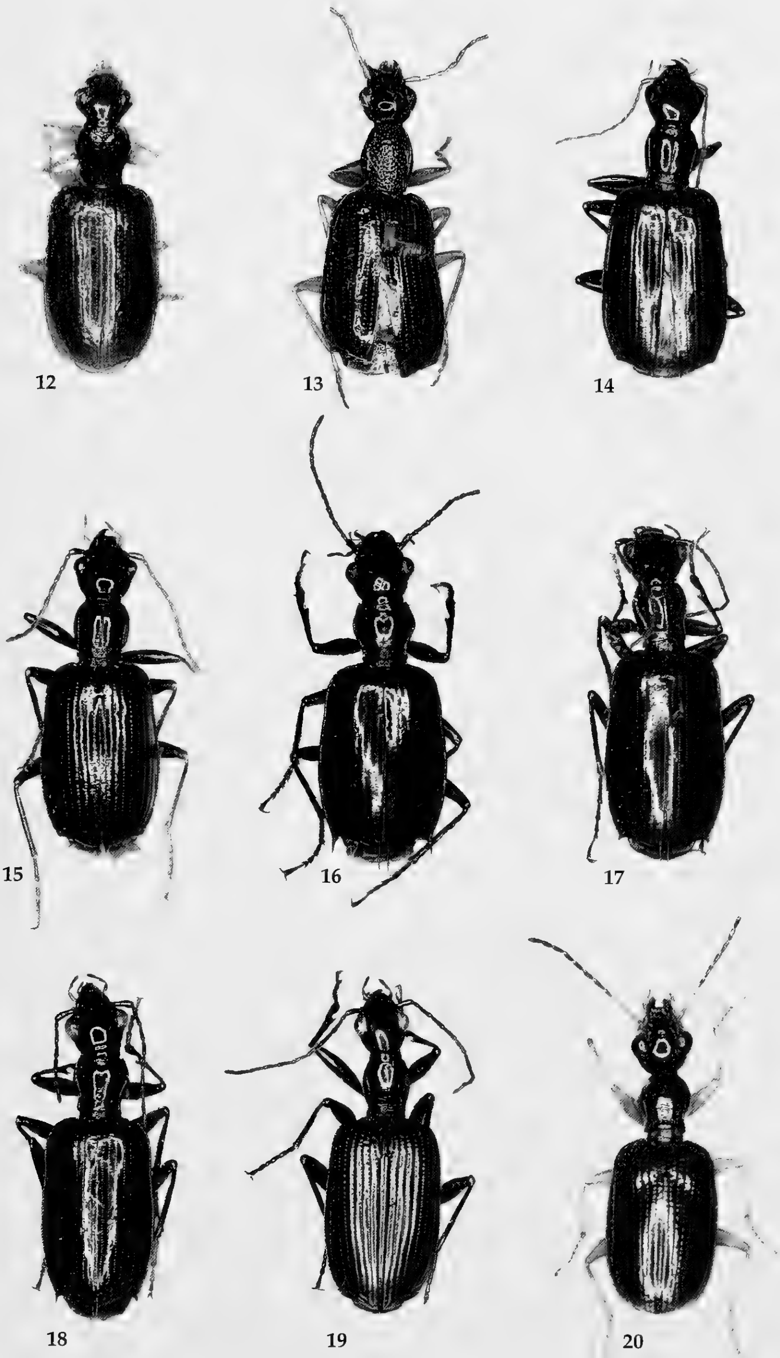
Distribution. New Guinea, Halmahera, Moluccas.

Collecting circumstances. All specimens mentioned above were collected at light.

Key to the species of the genus *Polydamasium* Liebke

1. Lateral apical angles of elytra rounded, apex barely excised; punctuation of elytral striae coarser, striae perceptibly punctate even in apical third; apical part of aedeagus more evenly sloping, apex less depressed and shorter (see fig. 7 in Donaubaur 1996). Philippines .... *strandi* Liebke

– Lateral apical angles of elytra angulate, apex well excised (Fig. 20); punctuation of elytral striae less coarse, striae not punctate in apical third; slope of apical part of aedeagus steep, apex depressed and longer (Fig. 10). New Guinea, Halmahera. .... *anomalum (Darlington)*



Figs 12-20. Habitus. **12.** *Dicraspeda subrufipennis*, spec. nov. **13.** *Dicraspeda coeruleipennis*, spec. nov. **14.** *Discraspeda missai*, spec. nov. **15.** *Discraspeda glabripennis*, spec. nov. **16.** *Dicraspeda quadrispinosa brevipennis*, subspec. nov. **17.** *Dicraspeda quadrispinosa novabritannica*, subspec. nov. **18.** *Dicraspeda quadrispinosa moluccensis*, subspec. nov. **19.** *Eudalia liebherri*, spec. nov. **20.** *Polydamasium anomalum* (Darlington). Lengths: 5.0 mm; 5.7 mm; 8.0 mm; 7.9 mm; 10.9 mm; 11.6 mm; 11.7 mm; 8.8 mm; 6.5 mm.

Genus *Deipyrus* Liebke

Liebke, 1938: 104; Csiki 1932: 1542; Moore et al. 1987: 276; Lorenz 1998: 420; Baehr 2004: 146.

This name was introduced by Liebke (1938) for *Lachnothorax palustris* Sloane, 1910 and was used by Baehr (2004) for that species and the new species *D. inops* Baehr. Recently, W. Lorenz directed my attention to the supplement paper of Bousquet (2002) to Lorenz's catalogue (1998), in which Bousquet had detected that *Deipyrus* Liebke, 1938 is preoccupied by *Deipyrus* Champion, 1908 which is a genus of Curculionidae. As a consequence, Bousquet replaced *Deipyrus* Liebke, 1938 by *Deipyrodes* Bousquet, 2002 which now is the correct genus name for both recorded Australian species.

Remarks

As explained in my previous papers and as mentioned above, New Guinea apparently is the centre of diversity of the odacanthine genus *Dicraspeda*. But this not necessarily means that it is also the centre of origin of this genus. To decide about this would require a thorough phylogenetic survey of the genus which is at present not available. As explained in the revision of the Australian odacanthine species (Baehr 2004), the most plesiotypic odacanthine genus apparently occur in Australia (genus *Porocara* Sloane), and the genus *Eudalia* Castelnau likewise would have retained several plesiomorphic character states. The genus *Dicraspeda*, on the contrary, is much more apotypic, on the whole. Unfortunately, most of the various species-groups within *Dicraspeda* combine plesiomorphic **and** apomorphic characters in different combinations, hence decision about the most basic species or species-group is difficult. From my view, the species of the *obscura*-group (*obscura* Sloane, *coeruleipennis*, spec. nov.) and perhaps also *D. brunneipennis* (Sloane) might represent the most plesiomorphic type, because they neither possess denticulate or spinose elytra, nor is the marginal pronotal sulcus extensively developed, and their body shape is rather compact and convex, like in the genera *Porocara* and *Eudalia*. The great majority of the species of *Dicraspeda* in New Guinea thus belong to the apotypic *brunnea*-, *dubia*-, and *quadrispinosa*-groups, of which the latter two groups are barely represented in, or completely absent from Australia, respectively.

Although the greater number of odacanthine species occurring in New Guinea has Australian affinities and probably stem from Australian ancestors, a number of Oriental elements (*Archicolliuris, Eucolliuris, Polydamasium, Lachnothorax, Ophionea*) have invaded New Guinea but generally without having developed a similar taxonomic diversity as the Australian faunal elements. So, the New Guinean odacanthine fauna is a mixture of (older) Australian and (younger) Oriental elements, in which the number of genera is about equal, but in the number of species the Australian elements decidedly dominate.

Checklist of the genera and species of Odacanthinae presently known from New Guinea, New Britain, Solomon Islands, and New Hebrides

As enumerated in Baehr (2004) and including the new taxa described in this paper, the present number of Odacanthinae reliably recorded from the Papuan Subregion is 10 genera with 31 taxa recorded from New Guinea, 5 taxa from New Britain, 3 taxa from Solomon Islands all of which apparently are endemic species or subspecies, and one species endemic to New Hebrides.

Even with the new species and records included, the checklist below demonstrates the very insufficient knowledge of the odacanthine fauna of the western part of New Guinea (Irian Jaya) that had been almost neglected in the comprehensive work on the New Guinean Carabidae of Darlington (1968), because at that time almost no odacanthines had been collected in western New Guinea. In the meantime knowledge has been slightly improved through the efforts of several recent collectors (see papers of Baehr 1995, 1996a,b, 1997b, 1998, 2003c), but the odacanthine fauna of Irian Jaya, though even generally of New Guinea is still far from being well documented.

Almost nothing can be presently said about the degree to which the faunas of the Bismarck Archipelago, Solomon Islands, and New Hebrides are documented, but I guess that knowledge might be likewise absolutely insufficient.

In the list below NG means the whole island of New Guinea, PNG means Papua New Guinea (the eastern half of the island), and IJ means Irian Jaya, now Papua (the western part of the island). As this latter name is misleading, the former name is still used here.

Genus *Archicolliuris* Liebke, 1931

papua (Darlington, 1968)	PNG
par (Darlington, 1968)	PNG, New Britain

Genus *Basistichus* Sloane, 1917

micans (Macleay, 1864)	PNG, Australia

Genus *Clarencia* Sloane, 1917

papua Darlington, 1968	NG
quadridens Darlington, 1968	NG, Australia

Genus *Crassacantha* Baehr, 1995

bidens Baehr, 1995	IJ

Genus *Dicraspeda* Chaudoir, 1862

Macrocentra Chaudoir, 1869
Loxocara Sloane, 1907
Philemonia Liebke, 1938

bispinosa Darlington, 1968	PNG
coeruleipennis, spec. nov.	PNG
denticulata Baehr, 1997	PNG
dubia (Gestro, 1879)	IJ
glabripennis, spec. nov.	PNG
hebridarum Baehr, 1998	New Hebrides
inermis Louwerens, 1970	Solomon Is.
intermedia Baehr, 1997	IJ
laticollis Baehr, 1997	IJ
loebli Baehr, 1996	PNG
longiloba (Liebke, 1938)	PNG, New Britain, Australia
minuta Baehr, 1998	PNG
missai, spec. nov.	PNG
nigripes Baehr, 2003	PNG
obsoleta Baehr, 1996	IJ: Biak Is.
papuensis Baehr, 2003	PNG
quadrispinosa quadrispinosa (Chaudoir, 1869)	NG
quadrispinosa brevipennis, subspec. nov.	Solomon Is.: Bougainville
(*quadrispinosa moluccensis*, subspec. nov.	Halmahera)
quadrispinosa novabritannica, subspec. nov.	New Britain
ullrichi Baehr, 1996	PNG
violacea (Sloane, 1907)	NG, New Britain

Genus *Dobodura* Darlington, 1968

armata Darlington, 1968	PNG

Genus *Eucolliuris* Liebke, 1931

fuscipennis (Chaudoir, 1850)	PNG, Indonesia
rossi (Darlington, 1968)	PNG

Genus *Polydamasium* Liebke, 1938

anomalum (Darlington, 1968)	NG, Halmahera

Genus *Lachnothorax* Motschulsky, 1862

Lasiocolliuris Liebke, 1931

tokkia Gestro, 1875	PNG, Australia, Indonesia

Genus *Ophionea* Klug, 1821

Casnoidea Castelnau, 1834

brandti (Baehr, 1996)	Solomon Is.
gestroi Maindron, 1910	PNG, New Britain
puncticollis Sloane, 1923	PNG, Australia
thouzeti Castelnau, 1867	PNG, Australia

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References

Baehr, M. 1986. Revision of the Australian ground-beetle genus *Porocara* Sloane (Coleoptera: Carabidae: Odacanthinae). – Austral. J. Zool. **34**: 717-731

-- 1995. A new genus of Odacanthinae from New Guinea (Insecta, Coleoptera, Carabidae). – Spixiana **18**: 45-48

-- 1996a. Three new species of the genus *Dicraspeda* Chaudoir from New Guinea (Insecta, Coleoptera, Carabidae, Odacanthinae). – Spixiana **19**: 137-146

-- 1996b. The ground beetle genus *Casnoidea* Castelnau. Taxonomy, phylogeny, zoogeography (Insecta, Coleoptera, Carabidae, Odacanthinae). – Invertebr. Taxon. **10**: 1041-1084

-- 1996c. The Australian ground beetle genus *Porocara* Sloane. Second revision (Insecta, Coleoptera, Carabidae, Odacanthinae). – Spixiana **19**: 253-265

-- 1996d. Two new species of the genus *Lachnothorax* Motschoulsky from the Philippines (Insecta: Coleoptera: Carabidae: Odacanthinae). – Stuttgarter Beitr. Naturkde. Ser. A (Biologie), **539**: 1-8

-- 1997a. A new species of the genus *Casnoidea* CASTELNAU from Java (Coleoptera, Carabidae, Odacanthinae). - Entomofauna **18**: 385-389

-- 1997b. Three further new species of the genus *Dicraspeda* CHAUDOIR from New Guinea (Coleoptera, Carabidae, Odacanthinae). – Mitt. Münchner Ent. Ges. **87**: 29-37

-- 1998. Two further new species of the genus *Dicraspeda* Chaudoir from New Guinea and the New Hebrides (Insecta, Coleoptera, Carabidae, Odacanthinae). – Entomofauna **19**: 173-184

-- 1999. A new genus of Odacanthinae from northern central Australia (Insecta, Coleoptera, Carabidae). – Coleoptera **2**: 115-119

-- 2000. Some genera and species of ground beetles new to Australia (Coleoptera: Carabidae). – Mem. Queensland Mus. **46**: 9-14

-- 2003a. New taxa and new records of Odacanthinae from Sulawesi (Insecta, Coleoptera, Carabidae). – Spixiana **26**: 57-63

-- 2003b. A peculiar new genus of Odacanthinae from northern Australia (Insecta, Coleoptera, Carabidae). – Monogr. Mus. Sci. nat. Torino **35**: 99-110

-- 2003c. A revision of the *brunnea*-group of the genus *Dicraspeda* Chaudoir (Coleoptera, Carabidae, Odacanthinae). – Spixiana **26**: 249-267

– – 2004. A Revision of the Australian odacanthine ground beetles, including Checklists for Australia and the Papuan Subregion (Insecta: Coleoptera: Carabidae). – Mem. Qld. Mus. **50**: 133-194

Bousquet, Y. 2002. Additions and corrections to the world cataloge of genus-grop names of Geadephaga (Coleoptera) published by Wolfgang Lorenz (1998). – Folia Heyrovskiana, Suppl. **9**: 1-78

Chaudoir, M. de 1862. Matériaux pour servir à l'étude des Carabiques. 3e partie. – Bull. Soc. Imp. Nat. Moscou **35**: 275-320

– – 1869. Déscriptions de Cicindélètes et de Carabiques nouveaux par le Baron de Chaudoir. (Suite). – Rev. Mag. Zool. (2) **21**: 203-208

Csiki, E. 1932. Coleopterorum Catalogus. Vol. III. Carabidae III: Pars **124**, Harpalinae VII: 1279-1598. – W. Junk, Berlin

Darlington, P. J. Jr. 1968. The Carabid beetles of New Guinea. Part III. Harpalinae continued. Perigonini to Pseudomorphini. – Bull. Mus. Comp. Zool. **137**: 1-253

– – 1971. The Carabid beetles of New Guinea. Part IV. General considerations: analysis and history of the fauna. Taxonomic supplement. – Bull. Mus. Comp. Zool. **142**: 129-337

Donabauer, M. 1996. Beschreibung zweier philippinischer Colliurinen (Coleoptera: Carabidae). – Koleopt. Rundsch. **66**: 1-6

Jedlicka, A. 1963. Monographie der Truncatipennen aus Ostasien. Lebiinae – Odacanthinae - Brachyninae (Coleoptera, Carabidae). – Ent. Abh. Ber. Staatl. Mus. Tierkde Dresden **28**: 269-579

Liebke, M. 1938. Denkschrift über die Carabiden-Tribus Colliurini. – Festschr. Prof. Embrik Strand **4**: 37-141

Lorenz, W. 1998. Systematic List of extant Ground Beetles of the World (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae. Rhysodidae). – Tutzing, printed by the author. 502 pp.

Louwerens, C. J. 1956. On a collection of Carabidae from the northern Moluccas (Coleoptera). – Treubia **23**: 219-243

Moore, B. P., T. A. Weir & J. E. Pyke 1987. Rhysodidae and Carabidae. In: Zoological Catalogue of Australia **4**: 17-320. – Australian Governm. Publ. Serv., Canberra

Sloane, T. G. 1907. New Carabidae from German New Guinea and its Dependencies. (Col.). – Dt. Ent. Zschr. **1907**: 177-185

– – 1915. Studies in Australian Entomology. No. XVII. New genera and species of Carabidae. (Pamborini, Migadopini, Broscini, Cuneipectini, Nomiini, Pterostichini, Platynini, Oodini, Harpalini, Lebiini). – Proc. Linn. Soc. New South Wales **40**: 438-473

– – 1917. Carabidae from tropical Australia (New genera and Species, Notes and Synonymy, and Synoptic Tables. Tribes Scaritini, Harpalini, Odacanthini, Lebiini, and Helluonini). – Proc. Linn. Soc. New South Wales **42**: 406-438

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The tadpole of the Malagasy treefrog *Boophis rufioculis*: molecular identification and description

(Amphibia, Anura, Mantellidae)

Stéphane Grosjean, Meike Thomas, Frank Glaw & Miguel Vences

Grosjean, S., M. Thomas, F. Glaw & M. Vences (2006): The tadpole of the Malagasy treefrog *Boophis rufioculis*: molecular identification and description (Amphibia, Anura, Mantellidae). – Spixiana **29/1:** 73-76

The tadpole of *Boophis rufioculis* Glaw & Vences, a species of treefrog from Madagascar, is described for the first time, based on specimens identified by DNA barcoding. The larvae were collected in a stream and were rather generalized in body shape and oral disc morphology, largely agreeing with other previously described species of the *Boophis goudoti* group. Their keratodont row formula is 1:2+2/1+1:2.

Stéphane Grosjean, Muséum National d'Histoire Naturelle, Département Systématique et Evolution, UMS 602, Taxinomie et Collections – Reptiles et Amphibiens, case 30, 25, rue Cuvier, 75005 Paris, France; e-mail: sgrosjea@mnhn.fr

Meike Thomas, Institute for Genetics, Evolutionary Genetics, University of Cologne, Weyertal 121, 50931 Köln, Germany; e-mail: meike.thomas@uni-koeln.de

Frank Glaw, Zoologische Staatssammlung, Münchhausenstr. 21, 81247 München, Germany; e-mail: frank.glaw@zsm.mwn.de

Miguel Vences, Institute for Biodiversity and Ecosystem Dynamics, Zoological Museum, University of Amsterdam, Mauritskade 61, 1092 AD Amsterdam, The Netherlands; e-mail: vences@science.uva.nl

Introduction

The larval stages of Malagasy frogs have evolved a remarkable diversity of ecological and morphological adaptations (e.g. Blommers-Schlösser 1979a,b, Glaw & Vences 1994). In many small bodies of freshwater in Madagascar, tadpoles are the predominating aquatic vertebrates, because fishes are scarce both in terms of individuals and species in small mid- and high-altitude rainforest streams and ponds. Knowledge on the ecological and morphological adaptations of anuran larvae can therefore be of relevance to understand both the ecology of aquatic ecosystems in Madagascar, and to evaluate the habitat requirements and conservation priorities of Malagasy frogs. However, tadpoles have been described for only a few species, and the descriptions are largely based on the identification of reared juveniles, an error-prone procedure considering the many morphologically similar cryptic frog species in Madagascar (Glaw & Vences 2003).

Molecular methods offer an efficient alternative to identifying larval stages of organisms (e.g. Blaxter 2004). Such DNA barcoding (Hebert et al. 2003) identifies larvae by similarities, ideally identity, in the DNA sequences of a particular gene fragment. We have recently started a research program to apply this method to the identification of Malagasy tadpoles (Thomas et al. 2005) and have obtained evidence for an acceptable reliability of the method. Here we report on one of the results, the identification of the tadpole of *Boophis rufioculis*, and provide data on its morphology.

Material and Methods

Tadpoles were collected in the field and euthanised by immersion in chlorobutanol, and subsequently divided into series based on their morphology. A small portion of the caudal fin was removed from one specimen of each series for molecular analysis. This specimen (the DNA voucher) was used for the detailed description given below. All specimens were fixed and preserved in 5 % formalin. Vouchers were deposited in the Zoologische Staatssammlung München (ZSM). Comparative specimens were examined from the Zoological Museum Amsterdam (ZMA).

Molecular identification of the tadpole followed procedures described by Thomas et al. (2005). The partial 16S rDNA sequence of an adult *Boophis rufioculis* from the type locality An'Ala (no voucher) is deposited in Genbank under the accession number AY848623. The homologous sequence of the DNA voucher tadpole (ZSM 591/2004) has the accession number DQ003334. The two sequences are identical, whereas related species (*B. boehmei, B. burgeri, B. madagascariensis, B. reticulatus*; accession numbers AY848561, AY848566, AY848576, AY848612) all had pairwise divergences of more than 5 %.

Morphological terminology follows Altig & McDiarmid (1999) and developmental stages were determined according to Gosner (1960). Keratodont row formula is given according to Dubois (1995). Measurements were taken with a graduated ocular attached to a stereomicroscope except for the total length which were measured with a hand caliper. The landmarks are those shown in Altig & McDiarmid (1999, p. 26: Fig. 3. 1.), for other see Grosjean (2001). Drawings were made with the aid of a camera lucida.

The abbreviations used in the description are the following: BH maximum height of body; BL body length; BW maximum width of body; DG maximum size of dorsal papilla gap; ED maximum diameter of eye; HT maximum height of tail; LF maximum height of lower tail fin; MC maximum height of caudal muscle; NN internarial distance; NP naro-pupilar distance; ODW oral disc width; PP interpupilar distance; RN rostro-narial distance; SS distance from tip of snout to opening of spiracle; SU distance from snout to beginning of upper tail fin; TL total length; UF maximum height of upper tail fin.

Results and Discussion

A series of four tadpoles were identified as belonging to *Boophis rufioculis*. The specimens were collected in a non-protected and degraded forest named An'Ala (18°56'S, 48°28'E; altitude about 840 m above sea level), on 1 March 2003 by M. Thomas, F. Glaw and M. Puente. Tadpoles were found in a slowly running brook of about 2 m width and a variable depth of 40-70 cm. The description is based on a DNA voucher specimen at stage 25 (ZSM 591/2004, BL 10.9 mm). Because a part of the tail was taken for DNA barcoding determination and was also damaged, information upon tail fin and tip of tail was taken from the other individuals.

In dorsal view (Fig. 1a), body elliptical, widest at the level of gills, snout nearly rounded. In lateral view (Fig. 1b), body slightly depressed, BW 111 % of BH, snout rounded. Eyes of moderate size, ED 17 % of BL, bulging, not visible in ventral view, positioned and directed almost dorsally. Nares rounded, of moderate size, rimmed with a very slight mid-dorsal projection, positioned almost dorsally but directed anterolaterally and with the opening directed laterally, closer to snout than to center of eye, RN 59 % of NP; NN 66 % of PP. Spiracle sinistral, slightly conical, moderately small, attached to body wall but its tip free, laterally positioned, oriented almost posteriorly, closer to end of body than to tip of snout, SS 64 % of BL; spiracular opening oval, situated at the height of the lower part of caudal muscle. Tail musculature moderate, MC 62 % of BH and 61% of HT, gradually tapering, reaching tail tip. Tail fins of moderate size, UF 33 % of HT, LF 26 % of HT, upper fin not extending onto body, SU 120 % of BL, slightly convex, lower fin slightly convex but following the caudal muscle; point of maximum height of tail located at the first third of tail length, HT 102 % of BH, tail tip finely rounded. Anal tube moderately large, dextral, flattened tubular, directed more posteriorly than posteroventrally, proximal half linked to ventral tail fin, opening dextral. Neither lateral line nor glands visible.

Oral disc (Fig. 1c) positioned and directed anteroventrally, emarginated, of moderate size, ODW 25 % of BL and 41 % of BW. A row of marginal papillae largely interrupted medially on the upper labium, DG 65 % of ODW, lower labium with a medial notch; one submarginal papillae at a corner of upper labium, 3 on the other side at the end of A1, A2 and the third hidden by a fold, 3 to 4 on a row at each side of the lower labium leaving the median third free of submarginal papillae; papillae moderately small and conical with a rounded tip. No denticulate papillae. Keratodont row formula 1:2+2/1+1:2, rows of upper labium subequal, as are P1 and P2, P3 about two third of P2. Jaw sheaths of moderate breadth, bearing large serrations, upper jaw sheath concave with a large medial serration surrounded by a smaller on each side forming a slight convexity, brown with black serrations, lower jaw sheath V-shaped, strong, black, the part covered by the lower labium dark orange.

Tadpole transparent, all underlying organs visible. Upper side and upper flanks slightly coloured by some orange-brown diffused pigment that is present in some of the different layers of tissue. The

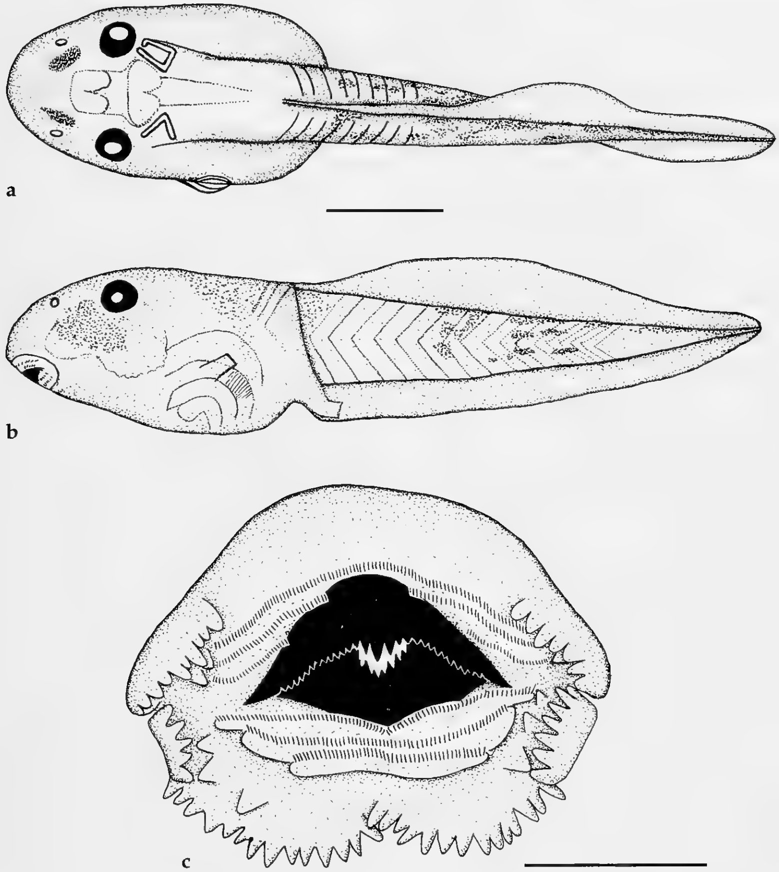

Fig. 1. Drawings of the tadpole of *Boophis rufioculis* (ZSM 591/2004). **a.** Dorsal view. **b.** Lateral view. **c.** Oral disc. Scale bars represent 5 mm in a and b, and 1 mm in c.

brain particularly well underlined by this colouration, the part anterior to eyes and the orbitohyoidien muscle coloured, a spot in the inner posterolateral side of nares. Ventral side and lower part of flanks immaculate. Upper part of caudal muscle coloured with the same tint, especially the proximal third, the lower part much less. Fins immaculate.

Variation was assessed based on three additional tadpoles at stage 25 (ZSM 592/2004-ZSM 594/2004). TL and BL of these three tadpoles are 29.9-31.1 mm (mean ± sd = 30.5 ± 0.6) and 10.9-11.6 mm (mean ± sd = 11.2 ± 0.3). The ratios vary in the following proportions: BW 116-123 % of BH; ED 16-17 % of BL; RN 53-54 % of NP; NN 57-64 % of PP; SS 55-65 % of BL; MC 49-63 % of BH; MC 53-55 % of HT; UF 32-34 % of HT; LF 24-28 % of HT; SU 81-88 % BL; HT 93-113 % of BH; ODW 24-25 % of BL; ODW 35-43 % of BW; DG 60-68 % of ODW.

Variation of the number of submarginal papillae is as follows: upper labium 2+1, 2+2, 2+2, lower labium 2+3, 4+3, 2+2. The colouration can form ill-defined bands on the proximal third of the upper part of the caudal muscle and some spots on its lower part and the rest of the upper part. Otherwise the keratodont row formula is homogenous within the sample, as well as the morphology and colouration except the small amount of variation reported above.

The genus *Boophis* has been divided into seven phenetic species groups (Blommers-Schlösser 1979b, Glaw & Vences 1994). *Boophis rufioculis* is part of the *B. goudoti* group (Glaw & Vences 1997) that contains at present eight species (Glaw & Vences 2003). This and five other species groups (all except the *B. tephraeomystax* group) belong into a clade of stream-breeding *Boophis* that is well-defined by molecular characters (Vences et al. 2002). Species of the *B. goudoti* group are usually found along streams, but tadpoles are so far only known for *B. goudoti* and *B. madagascariensis*. The finding of the tadpole of

B. rufioculis in running water confirms that this species is a rather generalized stream-breeder. Although the general morphology roughly agrees with those of *B. goudoti* and *B. madagascariensis*, the oral disc shows conspicuous differences such as a lower number of keratodont rows on the upper labium (3 in *B. rufioculis* vs. 4-7), a small papilla gap on the lower labium (also present in *B. goudoti*) and a large medial serration surrounded by a smaller one on each side forming a slight convexity on the upper jaw sheath.

Acknowledgements

We are grateful to Marta Puente, Liliane Raharivololoniaina and David R. Vieites for assistance in the field, and to the Malagasy authorities for granting research and export permits. This project was supported by the Volkswagen Foundation, and by a SYNTHESYS grant to the first author.

References

Altig, R. & R. W. McDiarmid 1999. Body plan. Development and morphology, pp. 24-51. In: McDiarmid, R. W. & R. Altig (eds.), Tadpoles. The biology of anuran larvae. – The University of Chicago Press, Chicago and London

Blaxter, M. L. 2004. The promise of a DNA taxonomy. – Phil. Trans. Roy. Soc. Lond. **B 359**: 669-679

Blommers-Schlösser, R. M. A. 1979a. Biosystematics of the Malagasy frogs. I. Mantellinae (Ranidae). – Beaufortia **352** (2): 1-77

– – 1979b. Biosystematics of the Malagasy frogs. II. The genus *Boophis* (Rhacophoridae). – Bijd. Dierk. **49**: 261-312

Dubois, A. 1995. Keratodont formulae in anuran tadpoles: proposals for a standardization. – J. Zool. Syst. Evol. Res. **33**: I- XV

Glaw F. & M. Vences 1994. A fieldguide to the amphibians and reptiles of Madagascar. 2nd edition. – Köln, Vences and Glaw Verlag

– – & – – 1997. Neue Ergebnisse zur *Boophis goudoti*-Gruppe aus Madagaskar: Bioakustik, Fortpflanzungsstrategien und Beschreibung von *Boophis rufioculis* sp. nov. – Salamandra **32** (4): 225-242

– – & – – 2003. Introduction to Amphibians. In: Goodman S. M. & J. P. Benstead (eds): The Natural History of Madagascar, pp. 883-898. – The University of Chicago Press, Chicago and London

Gosner, K. L. 1960. A simplified table for staging anura embryos and larvae with notes on identification. – Herpetologica **16**: 183-190

Grosjean, S. 2001. The tadpole of *Leptobrachium (Vibrissaphora) echinatum* (Amphibia, Anura, Megophryidae). – Zoosystema **23** (1): 143-156

Hebert, P. D. N., A. Cywinska, S. L. Ball & J. R. deWaard 2003. Biological identification through DNA barcodes. – Proc. R. Soc. Lond. B **270**:313-321

Thomas, M., L. Raharivololoniaina, F. Glaw, M. Vences & D. R. Vieites 2005. Montane tadpoles in Madagascar: molecular identification and description of the larval stages of *Mantidactylus elegans*, *M. madecassus* and *Boophis laurenti* from the Andringitra Massif. – Copeia **2005**: 174-183

Vences, M., F. Andreone, F. Glaw, J. Kosuch, A. Meyer, H.-C. Schaefer & M. Veith 2002. Exploring the potential of life-history key innovation: brook breeding in the radiation of the Malagasy treefrog genus *Boophis*. – Mol. Ecol. **11**: 1453-1463

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Visiana sordidata (Moore), a complex of species from the Indo-Pacific region

(Insecta, Lepidoptera, Geometridae, Larentiinae)

Olga Schmidt

Schmidt, O. (2006): *Visiana sordidata* (Moore), a complex of species from the Indo-Pacific region (Insecta, Lepidoptera, Geometridae, Larentiinae). – Spixiana **29/1:** 77-85

The present study clarifies the taxonomy of the Indo-Pacific species-group *Visiana sordidata* (Moore), a representative of the geometrid subfamily Larentiinae. Historically, *V. sordidata* comprised three subspecies: *V. s. robinsoni* (Prout), *V. s. inimica* (Prout), and *V. s. tamborica* (Prout). However, examination of about 80 specimens revealed that all supraspecific taxa should be regarded as distinct species: *V. robinsoni*, stat. nov., *V. inimica*, stat. nov., and *V. tamborica*, stat. nov. Furthermore, the specimens from Borneo (Malaysia) are assigned to a new species, *V. hollowayi*, spec. nov. The five *Visiana* species belong to two different species-groups for which the diagnostic characters are defined. Lectotypes are designated for *V. sordidata*, *V. robinsoni*, and *V. tamborica*. The new species, *V. hollowayi*, is described and illustrated. Redescriptions of *V. sordidata*, *V. robinsoni*, *V. inimica*, and *V. tamborica* are provided. Figures of adults, genitalia, and tympanal organs of all five species are given.

Olga Schmidt, Zoologische Staatssammlung München, Münchhausenstraße 21, D-81247, München, Germany; e-mail: Olga.Schmidt@zsm.mwn.de).

Introduction

The genus *Visiana* Swinhoe (1900) contains medium-sized to relatively large-sized geometrid moths of the subfamily Larentiinae, of which the mainly dark, brownish colouration resembles that of species of the Australasian genus *Scotocyma* (Holloway 1997, Schmidt 2003, 2005, in press). The genus is widely distributed within the Indo-Pacific region, from north-eastern Himalaya to Papua New Guinea and eastern Australia, including the Greater- and the western part of the Lesser Sunda Islands, including the Moluccas.

According to Scoble (1999), the genus *Visiana* currently comprises the following species: *V. brujata* (Guenée, [1858]), *V. excentrata* (Guenée, [1858]), *V. hyperctenista* (Prout, 1939), *V. sordidata* (Moore, 1888) [with three subspecies, *V. s. inimica* (Prout, 1937), *V. s. robinsoni* (Prout, 1939) and *V. s. tamborica* (Prout, 1939)], and *V. vinosa* (Warren, 1907) with one subspecies *V. v. ranensis* (Prout, 1939). Although the species of the genus were listed or briefly discussed in several studies (Holloway 1979, 1986, McQuillan & Edwards 1996, Holloway 1997, Scoble 1999, Schmidt 2003), examination of the genitalia was still mostly lacking. Holloway (1997) discussed generic limits of the *Visiana* in general outline, published for the first time several photographs of *Visiana* genitalia and discovered an undescribed species within the genus.

Examination of phylogenetic relationships of *Visiana* and related larentiine genera suggested *Visiana* was not monophyletic (Schmidt 2005 and unpublished data). Consequently, the status of several subspecies needed to be reconsidered, and species had to be described as new. The primary aim of this paper is to solve the taxonomic problems within the species-complex of *V. sordidata*. The paper is part of

Fig. 1. *Visiana robinsoni*, male palp.

a comprehensive revision of the genus *Visiana* based on adult and genitalic morphology which is currently in progress (Schmidt, unpublished data).

Material and methods

About 80 specimens of *V. sordidata* from the Indo-Pacific region were studied from the following institutions: The Natural History Museum (including specimens from the accessions), London (BMNH); Museum für Naturkunde der Humboldt-Universität zu Berlin (MNHU); M. Sommerer Private Collection (MSPC).

Wing expanse was measured as twice the distance from midthorax to the forewing apex. The dissected genitalia and the abdomen have been stained with Chlorazol Black in a 30 % solution of alcohol and mounted on slides in euparal. Nomenclature for adult morphology and terminology for genitalia used in this paper is taken from Pierce (1914), Forbes (1948), Klots (1970) and Nichols (1989), terms for tympanal organs follow Cook & Scoble (1992).

Photomicrographs were taken using a digital camera (ProgRes 3012, Jenoptic Laser Systems GmbH) attached to a microscope and processed with the AutoMontage system (version 4.03 Synoptics Ltd). Photographs of adults were taken with a Nikon Coolpix 990. The digital images were enhanced and the plates compiled with Adobe Photoshop™.

Notes on taxonomic history

Scotosia sordidata was described by Moore (1888), and later it was placed in the newly described monotypic genus *Visiana* by Swinhoe (1900). Prout (1937) described the first subspecies *Xanthorhoe sordidata inimica* from east Java. Two years later Prout (1939) described two new subspecies, *X. s. robinsoni* from west Sumatra and *X. s. tamborica* from Sambawa in the Lesser Sunda Islands. Holloway (1986) briefly reviewed the genus and gave the distribution of *V. sordidata* in the Himalaya and the mountains of Sumatra, Java, Sumbawa, and Kinabalu. Holloway (1997) in his comprehensive review of the geometrid moths of Borneo, being under time constraints, did not go into the details and listed the species *V. sordidata* with three subspecies, figured a male from Kinabalu (Borneo) as *V. sordidata* and also figured the genitalia of a female from Sambawa (Lesser Sunda Islands). At present, *V. sordidata* contains three subspecies, *V. s. inimica*, *V. s. robinsoni* and *V. s. tamborica* (Scoble 1999).

Visiana Swinhoe, 1900

Visiana Swinhoe, 1900: 335.

Type species: *Scotosia sordidata* Moore, 1888 (by monotypy).

Diagnosis. Labial palpus rather thick, very short, curved, with terminal segment very small. Antenna in male bipectinated. Forewing with two areoles, brownish coloured, with a discal dot, with median band forming a tooth-like medial projection outwards, underneath rather uniformly coloured. Coremata in males shaped like a broad pocket laterally on each side of the seventh segment. A broad, weakly sclerotised ring between the seventh and the eighth segments is present. The ventral surface of the seventh abdominal segment in females is rough. Tympanal ansa hammer-shaped, with medial rounded broadening, without a scoloparium (Schmidt 2005, in press; Figs 29-33). In the male genitalia tegumen shorter than vinculum, with sclerotised lateral arms, valvae with costa projecting in an apical process and with basal projection, vinculum with distinct saccus, juxta with lateral papillae, calcar absent. In female genitalia antrum without folds of sclerotisation, corpus bursae medium-sized to large, membranous, with a small diverticulum, signum usually present.

Visiana sordidata (Moore)

Figs 2, 14, 15, 16, 26, 32

Scotosia sordidata Moore, 1888: 274.
Visiana sordidata (Moore): Swinhoe 1900: 335; Holloway 1997: 192.
Xanthorhoe sordidata (Moore): Prout 1939: 257.

Types. Lectotype: ♂, India. Darjeeling, 2121 m, no other data; lectotype hereby designated (BMNH, examined).

Other material examined. 5♂♂, India, Moore coll., no further data (BMNH); 3♂♂, India, Darjeeling, coll. Atkinson or coll. Staudinger, no collector, no date (MNHU); 1♂, near Darjeeling, W. H. Bath, no date (BMNH);

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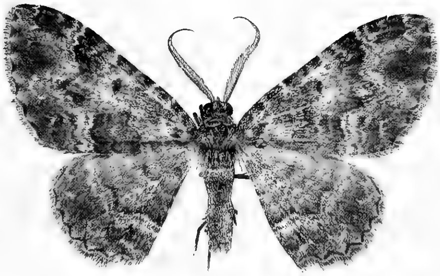

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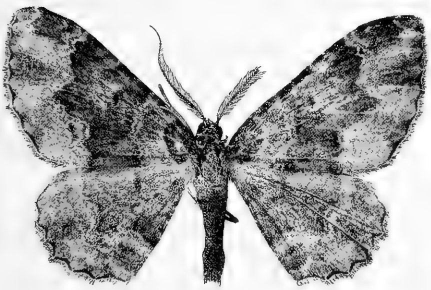

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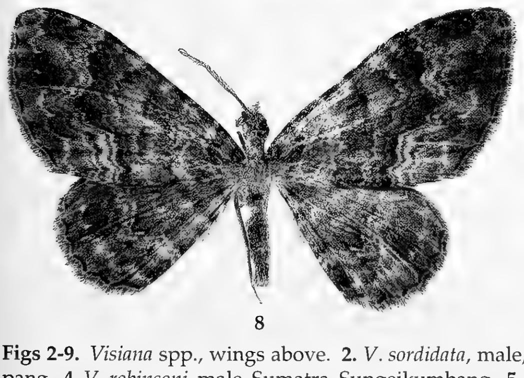

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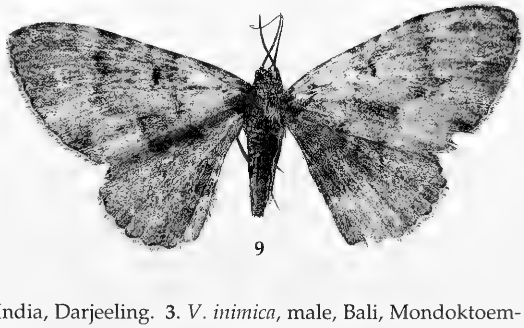

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Figs 2-9. *Visiana* spp., wings above. **2.** *V. sordidata*, male, India, Darjeeling. **3.** *V. inimica*, male, Bali, Mondoktoempang. **4.** *V. robinsoni*, male, Sumatra, Sungeikumbang. **5.** *V. robinsoni*, female, Sumatra, Sindar Raya. **6.** *V. tamborica*, male, Tambora, Sambawa. **7.** *V. tamborica*, female, Tambora, Sumbawa. **8.** *V. hollowayi*, spec. nov., male, Borneo, Mt. Kinabalu. **9.** *V. hollowayi*, spec. nov., female, Borneo, Sabah, Brumas.

Figs 10-14. *Visiana* spp., wings underneath. **10.** *V. tamborica*, male, Tambora, Sumbawa. **11.** *V. inimica*, male, Bali, Mondoktoempang. **12.** *V. hollowayi*, spec. nov., male, Borneo, Mt. Kinabalu. **13.** *V. robinsoni*, male, Sumatra, Sungeikumbang. **14.** *V. sordidata*, male, India, Darjeeling.

5♂♂, India, Assam, Khasia Hills, no date or 1893, or iii.1894, no collector or Hamilton; 7♂♂, India, Assam, Cherrapunj, no collector, iv.1893 or xi.1893, or xii.1893, or no date, ex. coll. Swinhoe; 1♂, India, Assam, Jaintia Hills, ex. coll. Swinhoe, no further data; 1♂, India, Assam, Margarita, v.1889, W. Doherty; 2♂♂, India, Assam, Shillong, no further data (all BMNH); 16♂♂, India, Sikkim, Guntok, 1894, no collector or Möller; Kurseong, Vallée de la Teesta, no further data; Interior, 1-1212 m, or 17.x.1888; Mana, no date or 20.iv.1888 (BMNH); 1♂, Myanmar, Mishmi Hills, Dingliang, 742 m, M. Steele, 13.iii.1935; 4♂♂, Hills E of Toungho, no collector, iii.1896; 2♀♀, Myanmar, (in one female abdomen missing), East Pegu (Bago), 152-606 m, W. Doherty, iii-iv.1890 (BMNH).

Description

Labial palpi brown, with light brown scales at the apex. Wing expanse 36-44 mm. Forewings above ochreous-brown to brown, with median band brown, narrowing to the hind margin, with a broad medial projecting tooth, edged with thin, dark brown and ochreous-brown wavy lines, underneath pale ochreous-brown, with a few median wavy, brownish lines, forming a medial projecting tooth outwards, and brownish postmedian band. Hind wings above coloured as forewings, with wavy, brown, median and postmedian lines, underneath coloured and patterned as forewings but with discal dot much less distinct (Figs 2, 14).

Male genitalia (Figs 15, 16). Uncus very small, triangular, fused with tegumen; tegumen broad, hemispherical, with long, almost straight lateral arms protruded to the base of juxta; valvae short, with rather long, basal, inwardly directed projection, with costa broad, sclerotised, slightly twisted, with relatively long and thick projecting apical process; saccus massive, protruded; juxta with small, apically flatterned lateral papillae; aedeagus curved, with anellus covered with fine spines, weakly sclerotised apically, without cornuti or distinct scobination in vesica.

Female genitalia (Fig. 26). Antrum relatively small, completely sclerotised; ductus bursae weakly sclerotised, hardly differentiated from corpus; corpus bursae very large, elongated, retort-shaped, membranous, with a small diverticulum connected to the corpus by a short, thin tube, with ductus seminalis set medially on corpus bursae near the signum; signum a relatively small patch of stout, inwardly directed spicules.

Distribution. India (north), Myanmar.

Remarks. A single female of *V. sordidata* available for study from Myanmar was dissected in 1948 (slide number 137, BMNH). The slide is in good condition but the seventh abdominal segment is missing. Therefore it is not possible to discuss the presence or shape of the "pockets" in this species.

Visiana robinsoni (Prout), stat. nov.

Figs 1, 4, 5, 13, 23, 24, 25, 29

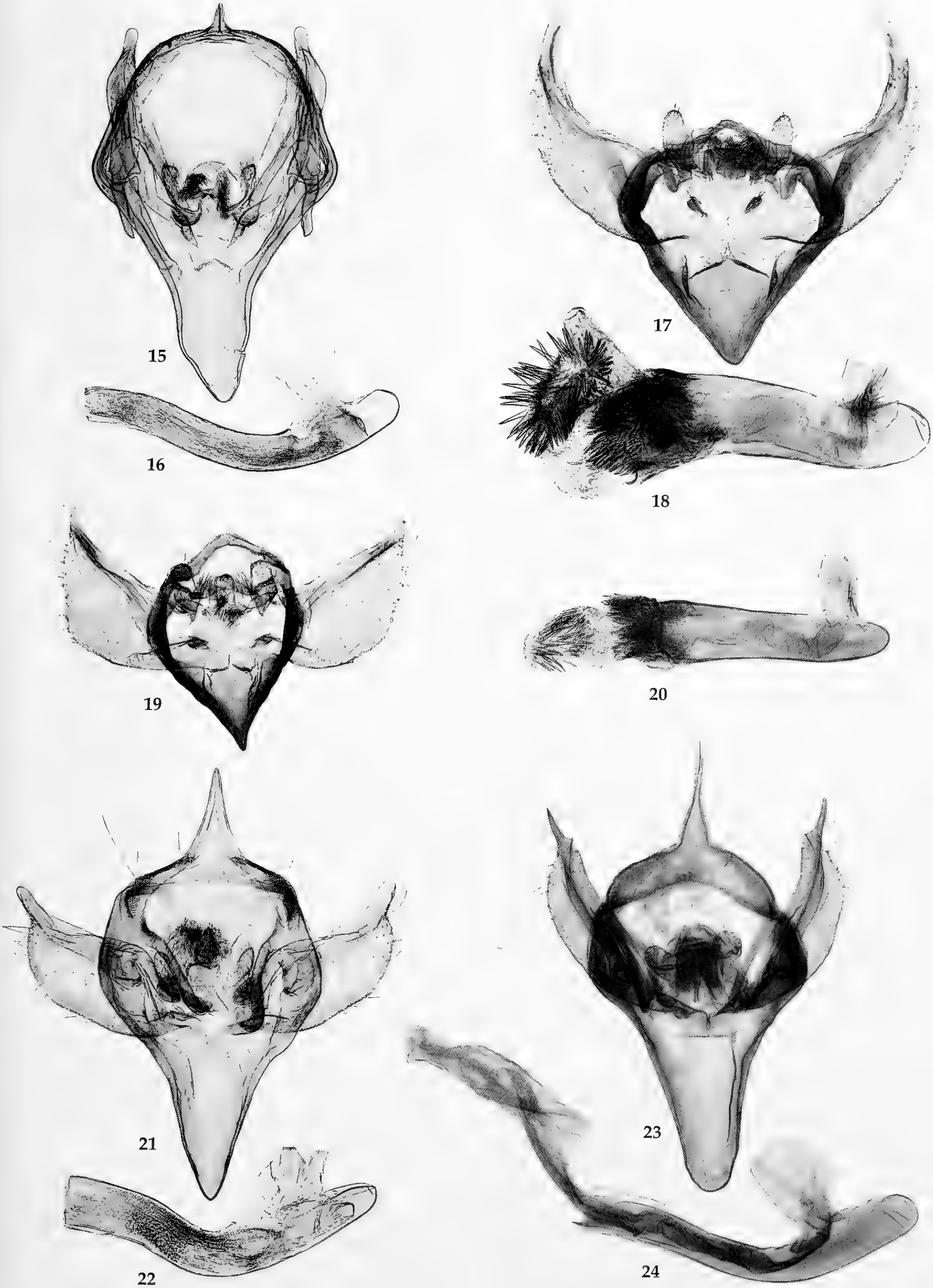
Xanthorhoe sordidata robinsoni Prout, 1939: 257.
Visiana sordidata robinsoni (Prout): Holloway 1997: 192.

Types. Lectotype ♂, Sumatra (west), Korinchi (Korintji), Sungeikumbang, 1360 m Robinson & Kloss, iv. 1914 (BMNH); lectotype hereby designated (BMNH, examined). – Paralectotypes: 3♂♂, same data as lectotype, but 1360-1420 m (BMNH, examined).

Other material examined. 1♂, Sumatra, M[a]ssn[er] G., no date (MNHU); 1♂, 1♀, Sumatra, Sindar Raya, 400 m and 480 m, E.W. Diehl, 26.v.1995 and 10.iii.1991 (MSPC).

Description

Labial palpi dark brown, with lighter brown scales. Abdomen with darker brown and some pink



Figs 15-24. *Visiana* spp., male genitalia. **15,17,19,21,23**: armature, **16,18,20,22,24**: aedeagus. **15-16.** *V. sordidata*. **17-18.** *V. inimica*. **19-20.** *V. tamborica*. **21-22.** *V. hollowayi*, spec. nov. **23-24.** *V. robinsoni*.

Figs 25-28. *Visiana* spp., female genitalia. **25.** *V. robinsoni.* **26.** *V. sordidata.* **27.** *V. tamborica.* **28.** *V. hollowayi*, spec. nov.

scales on the third segment dorsally. Wing expanse 40-42 mm. Forewings above ochreous-brown to brown, with some pinkish scales, with basal band with two teeth pointed outwards, with median band darker brown, with distinct medial projection outwards, edged with dark brown and a very thin, interrupted whitish line, underneath pinkish-brown, with a few blackish-brown, wavy lines, with the outer line forming a distinct, rounded projection outwards. Hind wings above of similar colour as forewings, but slightly lighter, with basal area darker, with brown median line, forming a rounded medial projection outwards, underneath coloured and patterned as forewings (Figs 4, 5, 13). Ventral surface of the seventh abdominal segment in females distinctly rough, with a pair of rather long, narrow, cone-shaped "pockets" (Fig. 25).

Male genitalia (Figs 23, 24). Uncus relatively long, slightly thickened at base, tapering towards the apex; tegumen broad, cupola-shaped, with long, almost straight lateral arms protruded to the base of juxta; valvae medium sized, with costa sclerotised, twisted apically, with thin, distally relatively sharp, projecting apical process; saccus massive, elongated; juxta with small, apically rounded lateral papillae; aedeagus curved, thinner than in *V. hollowayi*, without cornuti or distinct scobination in vesica.

Female genitalia (Fig. 25). Antrum medium-sized, evenly sclerotised; ductus bursae relatively long and thin, evenly sclerotised, corpus bursae rather large, asymmetric, somewhat drop-shaped, with a rounded ventro-lateral broadening, membranous, with a small, oval diverticulum connected proximally to the corpus by a short, thin tube, with ductus seminalis set medially on corpus bursae; signum is larger than in all known *Visiana* species, polygonal patch of inwardly directed spicules.

Distribution. Indonesia (Sumatra).

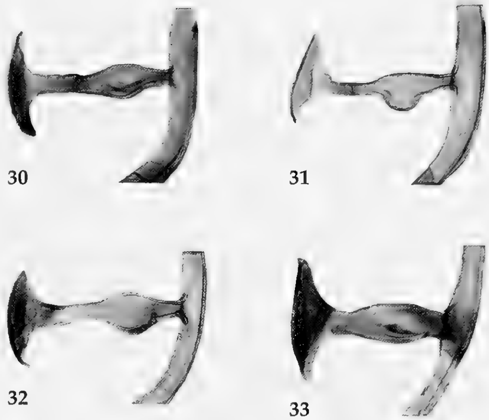
Remarks. In Scoble (1999) this species is listed as a subspecies of *V. sordidata.*

Visiana hollowayi, spec. nov.

Figs 8, 9, 12, 21, 22, 28, 30

Types. Holotype ♂, Borneo (north), Mt. Kinabalu, J. Waterstradt, 5.viii.1903 (BMNH). – Paratypes: 4♂♂, same data as holotype (BMNH); 1♀, Sabah, Brumas, Chey Vun Khen, 7.vii.1991 (BMNH).

29



30 31 32 33

Figs 29-33. *Visiana* spp. **29.** *V. robinsoni*, female, basal segments of abdomen with tympanal organs. **30-33**: ansa. **30.** *V. hollowayi*, spec. nov. **31.** *V. inimica*. **32.** *V. sordidata*. **33.** *V. tamborica*. a: ansa; st2: sternum 2; ty: tympanum.

Description

Labial palpi brown. Wing expanse 41-44 mm. Forewings above brown to purple-brown, with median band forming a medial projection outwards, edged with blackish-brown, underneath mainly dark brown, with a few indistinct dark brown, wavy lines, with a discal dot less distinct than in other species. Hind wings above of the same colour as forewings, with indistinct, brown and ochreous median lines, underneath coloured and patterned like forewings (Figs 8, 9, 12). Ventral surface of the seventh abdominal segment in females distinctly rough, with a pair of medium-sized, shallow, "pockets" (Fig. 28).

Male genitalia (Figs 21, 22). Uncus medium sized, elongate triangular, gradually tapering; tegumen broad, with long, bent lateral arms, thickened at base; valvae short, with costa sclerotised, thick, with thick, distally rounded, projecting apical process; saccus massive, similar to *V. sordidata* but slightly narrower; juxta with small, somewhat oval lateral papillae; aedeagus relatively thick, strongly bent, with anellus covered with spines which are thicker than in *V. sordidata*, weakly sclerotised apically, without cornuti but with distinct scobination in vesica.

Female genitalia (Fig. 28). Antrum medium-sized, evenly sclerotised; ductus bursae shorter than in *V. robinsoni* and *V. sordidata*, sclerotised, with thin lateral stripes of heavier sclerotisation, corpus bursae large, membranous, divided into two bulbs, the proximal one is larger, rounded, the distal one is narrower, oval, with a small, elongate drop-shaped diverticulum connected proximally to the corpus by a short, thin tube, with ductus seminalis arising close to the ductus bursae; signum a patch of stout, inwardly directed spicules, similar to *V. sordidata* but slightly larger.

Distribution. Malaysia [Borneo] (Sabah: Mt. Kinabalu, Brumas).

Etymology. The species is named after Dr. J. D. Holloway in recognition of his work on the Indonesian and Malaysian moth fauna.

Remarks. The male of this species and its genitalia were illustrated in Holloway (1997) as *V. sordidata*.

Visiana inimica (Prout), stat. nov.

Figs 3, 11, 17, 18, 31

Xanthorhoe sordidata inimica Prout, 1937: 181.
Visiana sordidata inimica (Prout): Holloway 1997: 192.

Types. Holotype ♂, Bali (west), Mondoktoempang, 750 m, J.P.A. Kalis, ix.1934 (BMNH, examined). – Paratypes: 2♂♂, Java (east), Nongkedjadjar, 1200 m, A.M.R. Wegner, xii.1933, i.1934; 1♂, Java (east), Tosari, E.A. Cockayne, 4.vii.1910 (BMNH, examined).

Other material examined. 2♂♂, Bali (east), Batoeriti, J. P. A. Kalis, vi.1935 (BMNH).

Description

Labial palpi brown, with light brown scales at the apex. Wing expanse 37-38 mm. Forewings above brown, with some ochreous scales, with median band brown to dark brown, thinner than in *V. sordidata*, with a medial projecting tooth, slightly narrower than in *V. sordidata* and *V. tamborica*, edged with thin, dark brown and ochreous-brown wavy lines, with distinct white scales, underneath brown, with some ochreous scales, with a median dark brown line, forming a medial projecting tooth outwards. Hind wings above coloured as forewings, with median line forming a double medial projecting tooth, underneath coloured and patterned as forewings (Figs 3, 11).

Male genitalia (Figs 17, 18). Uncus almost completely reduced; tegumen very short, broad, with curved lateral arms, thicker than in *V. tamborica*; valvae relatively long, thin, with costa broad, sclerotised, with a large, thick projecting apical process, rounded apically, with a short, curved basal projecting arm; saccus medium-sized, triangular-shaped; juxta with large, apically rounded lateral papillae; aedeagus massive, slightly curved, with anellus covered with relatively thick spines, with a large patch of long for the genus, firm cornuti in vesica. Female unknown.

Distribution. Indonesia (Bali, Java).

Remarks. In Scoble (1999) this species is listed as a subspecies of *V. sordidata*.

Visiana tamborica (Prout), stat. nov.

Figs 6, 7, 10, 19, 20, 27, 33

Xanthorhoe sordidata tamborica Prout, 1939: 257.
Visiana sordidata tamborica (Prout): Holloway 1997: 192 .

Types. Lectotype: ♂, [Lesser Sunda Islands], Tambora, Sambawa, 700-1200 m, W. Doherty, vi.1896; lectotype hereby designated (BMNH, examined). – Paralectotypes: 2♂♂, 2♀♀, same data as lectotype, but iv. or vi.1896 (BMNH, examined).

Other material examined. 2♂♂, [Lesser Sunda Islands], Lombok, Everett, v.1896 or Swinhoe coll. (BMNH).

Description

Labial palpi dark brown, with ochreous-brown scales at the apex. Wing expanse 36-42 mm. Forewings above ochreous-brown to brown, with median band distinct, especially in males, with a medial projecting tooth outwards, with postmedial area ochreous, underneath brown in basal half, ochreous-brown towards the termen, with a median brown line, forming a medial projecting tooth outwards. Hind wings above of similar colour as forewings, with median line forming a rather sharp medial projecting tooth, underneath coloured and patterned as forewings (Figs 6, 7, 10).

Male genitalia (Figs 19, 20). Uncus almost completely reduced; tegumen short, with very thin, curved lateral arms; valvae of medium length, relatively broad, with costa thin, sclerotised, with a very short for the genus projecting apical process, with a small, curved basal projecting arm; saccus relatively small, more or less triangular-shaped; juxta with relatively large, apically rounded lateral papillae; aedeagus thick, straight, with anellus covered with fine spines, weakly sclerotised apically, with a patch of rather thin cornuti in *vesica*.

Female genitalia (Fig. 27). Antrum broad and short, with a ring of weak sclerotisation distally; ductus bursae relatively short, sclerotised, with distinct lateral stripes of heavier sclerotisation, corpus bursae medium-sized, asymmetric, sack-shaped, with medium-sized distal extension, membranous, with wrinkles distally, with an elongate drop-shaped diverticulum, larger than in all species discussed here, connected to the corpus by a short, thin tube, with ductus seminalis arising from the extension of corpus bursae; signum absent.

Distribution. Indonesia [Lesser Sunda Islands] (Sambawa, Lombok).

Remarks. In Scoble (1999) this species is listed as a subspecies of *V. sordidata*. The female (genitalia only) is illustrated in Holloway (1997) as *V. sordidata*.

Discussion

The five species revised in this paper share the characters of the genus *Visiana* and form two distinct groups within the genus. The first group, including *V. sordidata*, *V. robinsoni*, and *V. hollowayi* is defined by the following genitalia characters: in **males** uncus developed, tapering apically, tegumen cupola-shaped, with long lateral arms, directed towards basis of juxta, costa of valvae with long basal projection, saccus very large, protruded, aedeagus curved; in **females** corpus bursae very large, without lateral stripes of sclerotisation apically.

The second group of species includes *V. inimica* and *V. tamborica* and can be defined as follows: in **males** uncus strongly reduced, tegumen shortened, with short, rather thin lateral arms, directed somewhat horizontally, costa of valvae with short basal projection, saccus medium-sized, triangular-shaped, not protruded, aedeagus almost straight; in **females** corpus bursae medium-sized, with lateral stripes of sclerotisation apically.

The first group of species is distributed in northern India, Myanmar, Indonesia (Sumatra) and Malaysia (northern Borneo). The second group occurs on the Greater and Lesser Sunda Islands (Java, Bali, Sumbawa and Lombok).

The biology of the species discussed is still unknown, including the food plants of the larvae. The species occur in the forest zone, from low elevations to about 2000 m. All specimens were collected at light at night. The species of the genus exhibit weak dimorphism of pattern in the forewing above, that of the female being less distinct. Males predominate in collections, comprising about 90 % of the specimens.

Acknowledgements

The work has been conducted at the Zoologische Staatssammlung (Munich) and the Natural History Museum (London). Support and help of the staff of the BMNH during my visits to the British Museum is generously acknowledged. Sincere thanks to Jeremy Holloway (BMNH), Martin Honey (BMNH), Wolfram Mey (MNHU), and Manfred Sommerer (Munich) for the loan of material used in this study. In addition, Jeremy Holloway and Stefan Schmidt (ZSM) are gratefully acknowledged for comments on the manuscript.

References

Cook, M. A. & M. J. Scoble 1992. Tympanal organs of geometrid moths: a review of their morphology, function, and systematic importance. – Syst. Ent. **17**: 219-232

Forbes, W. T. M 1948. Lepidoptera of New York and neighbouring states, part 2. – Cornell Univ. Agric. Exp. Stn. Mem. **274**: 128-175

Guenée, A. 1858 ['1857']. Species Général des Lepidoptères. In: Histoire Naturelle des Insectes, Vol. 10 (eds J. B. A. D. Boisduval & A. Guenée) pp. 1-584. – Roret, Paris

Holloway, J. D 1979. A survey of the Lepidoptera, biogeography and ecology of New Caledonia. – Ser. Ent. **15**: 1-588. The Hague, W. Junk

-- 1986. Origins of the Lepidopteran Faunas in High Mountains of the Indo-Australian tropics. In: High Altitude Tropical Biogeography. (eds F. Vuilleumier & M. Monasterio), pp. 533-556. – Oxford University Press, New York

-- 1997. The Moths of Borneo: family Geometridae, subfamilies Sterrhinae and Larentiinae. – Malay. Nat. J. **51**: 1-242

Klots, A. B 1970. Lepidoptera. In: Taxonomist's Glossary of Genitalia in Insects (ed. S. L. Tuxen), pp. 115-130. – Munksgaard, Copenhagen

McQuillan, P. B. & E. D. Edwards 1996. Geometridae. In: Checklist of the Lepidoptera of Australia. Monographs on Australian Lepidoptera, Vol. 4. (eds E. S. Nielsen, E. D. Edwards & T. V. Rangsi), pp. 200-228. – CSIRO, Melbourne

Moore, F. 1888. Descriptions of New Indian Lepidopterous Insects from the collection of the late Mr W. S. Atkinson Part **3**: 199-299. – Asiatic Society of Bengal, Calcutta

Nichols, S. W. (ed.) 1989. The Torre-Bueno Glossary of Entomology. – New York Entomological Society and American Museum of Natural History, New York

Pierce, F. N. 1914. The Genitalia of the Group Geometridae of the Lepidoptera of the British Islands. – F. N. Pierce, The Elms, Dingle, Liverpool

Prout, L. B. 1937. New and little-known Bali Geometridae in the Tring Museum. – Novit. Zool. **40**: 177-189

-- 1939. Larentiinae. In: Die Gross-Schmetterlinge der Erde. Fauna Indo-Australica, Bd. 12, (ed. A. Seitz), pp. 1-356. – Alfred Kernen Verlag, Stuttgart

Schmidt, O. 2003. Some results of taxonomic research on larentiine moths from the Australasian region. – Spixiana **26** (3): 204

-- 2005. Revision of *Scotocyma* Turner (Lepidoptera: Geometridae: Larentiinae). – Austral. J. Ent. **44** (3): 257-278

-- (in press). Australasian genus *Scotocyma* Turner (Lepidoptera: Geometridae: Larentiinae) and the recently described species *S. sumatrensis* Schmidt. – Heteroc. Sumatr.

Scoble, M. J. 1999. Geometrid Moths of the World : A Catalogue (Lepidoptera, Geometridae). – CSIRO Publishing, Collingwood, Victoria

Swinhoe, C. 1900. Catalogue of Eastern (and Australian) Lepidoptera Heterocera in the Collection of the Oxford University Museum. Part 2. – Clarendon Press, Oxford

Turner, A. J. 1904. Revision of Australian Lepidoptera. Family Geometridae. – Proc. Roy. Soc. Victoria **16**: 218-284

-- 1926. A revision of the Lepidoptera of Tasmania. – Pap. Proc. Roy. Soc. Tasmania 1925: 118-151

Warren, W. 1907. New Drepanulidae, Thyrididae, Uraniidae and Geometridae from British New Guinea. – Novit. Zool. **14**: 97-186

Buchbesprechungen

1. Robinson, W. H.: Urban Insects and Arachnids – A Handbook of Urban Entomology. – Cambridge University Press, Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, Sao Paulo, 2005, 472 pp. ISBN 0-521-81253-4

Daß der Mensch in seinem unmittelbaren Umfeld, d.h. in seinen verschiedenartigsten Wohnbereichen, Gebäuden und Städten nicht allein lebt, sondern mit ihm eine Vielzahl anderer meist kleiner tierischer Mitbewohner, ist in den Jahren des Hygienewahns und der Hoffnung auf Sterilität des menschlichen Umfelds vielfach in Vergessenheit geraten. Daß eine Vielzahl von Lebewesen sich an die sozialen Strukturen des Menschen angepaßt haben und in unmittelbarer Nähe zu ihm leben, der Ihnen ungewollt Unterschlupf und Nahrung gewährt, führte zu einer Allianz, die den Geschädigten, der von "ungeliebten Hausgenossen" oder "Ungeziefer" spricht, immer wieder zu Gegenschlägen herausfordert. Die Schaben, mit denen die vorliegende Zusammenstellung in Form eines großformatigen Handbuches beginnt, sind vermutlich die ältesten Begleiter seit der Städtegründungen in Mesopotamien oder China und haben sich vielfach inzwischen zu Kosmopoliten gemausert. In 17 Kapiteln werden die verschiedenen Insektengruppen, die auch in unseren Wohnbereichen auftreten, behandelt, wobei neben einer Einführung die wichtigsten Arten auch mit einer Detailzeichnung vorgestellt werden. Dabei wird der weltweite Aspekt berücksichtigt und die Abbildungen sind namhaften Bestimmungswerken und Monographien entnommen. Die jeweiligen Quellen sind leider nicht angegeben, auch wäre eine Bestimmungshilfe in Tabellenform hilfreich, da so nur der Fachmann eine Zuordnung vollziehen kann. Neben den echten Schädlingen, die Klassifikation erfolgt entsprechend der Schadwirkung für den Menschen, werden auch Lästlinge behandelt, die durchaus auch duldbar sind. Neben den Schaben (=Kakerlaken) werden holzbewohnende Käfer, Ameisen, die auf ihren Wanderzügen ganze Küchen leer räumen können, Stechmücken, Nahrungsmittelraupen, Läuse und Staubläuse und viele mehr aufgeführt. Dem großen Raum, der den Insekten gewidmet wird, folgt ein kleines Kapitel zu den Spinnentieren und Asseln, wobei bei ersteren die Zecken und Milben größte Beachtung finden, daneben aber auch giftige Spinnen und Skorpione, wobei letztere meist unbeabsichtigt eingeschleppt werden, andere, wie die Schwarze Witwe unter den Spinnen, als Kulturfolger auftreten. Das umfangreiche Register erleichtert die gezielte Suche, das jedem Kapitel beigefügte Literaturverzeichnis eine umfassendere Informationsmöglichkeit. Vorangestellt ist eine kurze Dokumentation der Wohnbereiche der Hausgenossen, ihrer Bedeutung, der Kontrollmöglichkeiten und des Einsatzes von Bekämpfungsmitteln, wobei der Vorbeugung dankenswerterweise besonders Rechnung getragen wird und die chemische Keule nicht als das Allheilmittel allein propagiert wird. Einige Hinweise zum Chemieeinsatz sind dahingehend zu modifizieren, daß die verzeichneten Substanzen nicht mehr in allen Ländern erlaubt sind. E.-G. Burmeister

2. Lieske, E. & R. Myers: Korallenriff-Führer Rotes Meer. – Franckh-Kosmos Verlag, Stuttgart, 2004. 381 S., 995 Farbfotos, 298 Farbzeichnungen, 1 farbige Landkarte. ISBN 3-440-09356-5

Dies ist die von R. Myers aus dem Englischen übersetzte deutschsprachige Ausgabe des "Coral Reef Guide Red Sea" (Collins Publ.), zu dem der Pionier der Freiwassertaucherei – Hans Hass – ein Vorwort verfaßt hat. Gleich vorweg: der Aufwand hat sich gelohnt. Das Buch wird als "Standardwerk für alle Taucher, Schnorchler und Aquarianer" angepriesen. Exakt das ist es, und trotz vieler Farbtafeln mit hochwertigem Druck wird dieses Werk zu einem erstaunlich niedrigen Preis angeboten.

Eine kurze Einführung stellt Geologie und Ozeanographie des Roten Meeres vor; auch die Gefährdung der Riffe kommt nicht zu kurz. Sehr gut und wichtig sind die Gefahrenhinweise (zusammengefaßt und bei den vorgestellten Arten), nicht nur bezüglich Tigerhai & Co. oder Rotfeuerfisch, sondern insbesondere dort, wo "Otto Normalverbraucher" diese nicht vermutet, wie etwa bei Korallenwelsen, einigen "Pseudokorallen" (Hydrozoa), Plattwürmern, Kegelschnecken, Heuschreckenkrebsen oder der Dornenkrone. Eine Liste interessanter Tauchplätze rundet den allgemeinen Teil ab.

Der Spezielle Teil dieses Faunenführers beschränkt sich bewusst auf die Makrofauna, wobei die Fische mit mehr als 60 Prozent des Gesamtvolumens dominieren. Deren durchwegs hervorragende Lebendfotos im Biotop werden ergänzt durch instruktive und praktische Vergleichstafeln, um die Bestimmung zu erleichtern. Aber auch die Evertebratenfauna kommt nicht zu kurz, wobei Schwämme, Nesseltiere, Plattwürmer, (wenig) Ringelwürmer, Weichtiere, Krebse, Stachelhäuter und Manteltiere, aber auch die wichtigsten Großalgen und Seegräser vorgestellt werden. Auch hier bestechen die Lebendfotos und machen so richtig Appetit auf die phantastische Unterwasserlandschaft des Roten Meeres.

Ein recht brauchbares Literaturverzeichnis, das allerdings wiederum auf die Fischfauna und allgemeine Faunistik beschränkt ist (ich vermisse z.B. die immerhin 300 Seiten dicke Monographie von Oliver 1992: Bivalved Seashells of the Red Sea), und ein Glossar schließen das Buch ab.

Resümee: Sollten Sie vorhaben, die Unterwasserwelt des Roten Meeres in Augenschein zu nehmen – kaufen, lesen, staunen, genießen. G. Haszprunar

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Pycnogonids under infralitoral stones at Cape Savudrija, Northern Adriatic Sea

(Pantopoda, Ammotheidae)

Maria F. Montoya Bravo, Leonie Meltzer, Roland Meyer & Roland R. Melzer

Maria F. Montoya Bravo, M. F., L. Meltzer, R. Meyer & R. R. Melzer (2006): Pycnogonids under infralitoral stones at Cape Savudrija, Northern Adriatic Sea (Pantopoda, Ammotheidae). – Spixiana **29/1:** 87-89

During 8 collection trips between September 2004 and August 2005, we found 58 pycnogonids all belonging to the family Ammotheidae (*Achelia langi* (Dohrn, 1881), *Ammothella appendiculata* (Dohrn, 1881), *Ammothella longioculata* (Faraggiana, 1940), *Ammothella biunguiculata* (Dohrn, 1881)) under stones and small rocks at Cape Savudrija, Northern Adriatic Sea. Species composition and relative abundance differ strongly from earlier pycnogonid samples generally taken from brown algae, hydrozoan colonies or dredge material.

Maria F. Montoya Bravo, Leonie Meltzer, Roland Meyer, Roland R. Melzer, Zoologische Staatssammlung, Münchhausenstr. 21, D-81247 München, Germany; phone: +49-89-8107-141, fax: +49-89-8107-300, e-mail: melzer@zsm.mwn.de

Introduction

At Cape Savudrija (15°28'N, 13°23'E), Northern Adriatic Sea (Croatia), one finds a shoal small bay of a depth of about 1 m exposed northwards (Fig. 1A). The ground of the bay (Fig. 1B) is filled with stones, small rocks, and sand below and between. The exposed parts of the stones are partly covered with algae and zoobenthos. Under the stones, a sheet of biogenous limestone is developed partly overgrown by sessile forms such as bryozoans and sponges. Between the stones, numerous individuals of *Anemonia viridis* (Anthozoa) are observed. While snorkling and "turning stones" in this bay, we found a remarkably high amount of ammotheid pycnogonids sitting under stones, well masked on the light brown limestone sheet and benthos organisms (Fig. 1C).

As most pycnogonid samples in the Mediterranean Sea in the past were collected from brown algae *(Halopteris, Cystoseira* and *Dictyota)*, hydrozoan colonies *(Eudendrium)* or from dredge material, we studied the infralitoral under-stone-communities in a more detailed way, and made 8 samples showing a species composition and relative abundance that is quite different from other pycnogonid samples collected in this area. It is indicated that the under stone habitat is an ammotheid domain with species only rarely found in other habitats. Previous studies on the pycnogonid fauna of the Northern Adriatic coast of Croatia have been made around Rovinj, about 40 km south of Cape Savudrija (Zavodnik 1968, Krapp-Schickel & Krapp 1975, Schüller 1989).

Material and methods

While snorkling at Cape Savudrija, stones and small rocks were turned around and inspected either in the water or after taking them out. Pycnogonids were seized by hand or with forceps and fixed in 70 % ethanol. Altogether, we made 8 afternoon collection trips (3.9.2004, 8.10.2004, 28.12.2004, 25.1.2005, 25.4.2005, 22.5.2005, 8.8.2005, 15.8.2005), each of a duration of between 1 and 2 hours. Up to a third of the identified pycnogonids were washed away by the sea before they could be seized. In addition it was not easy to see the animals as they have the same colour as the stones they are sitting on. Hence, we assume that less than a half of the indi-

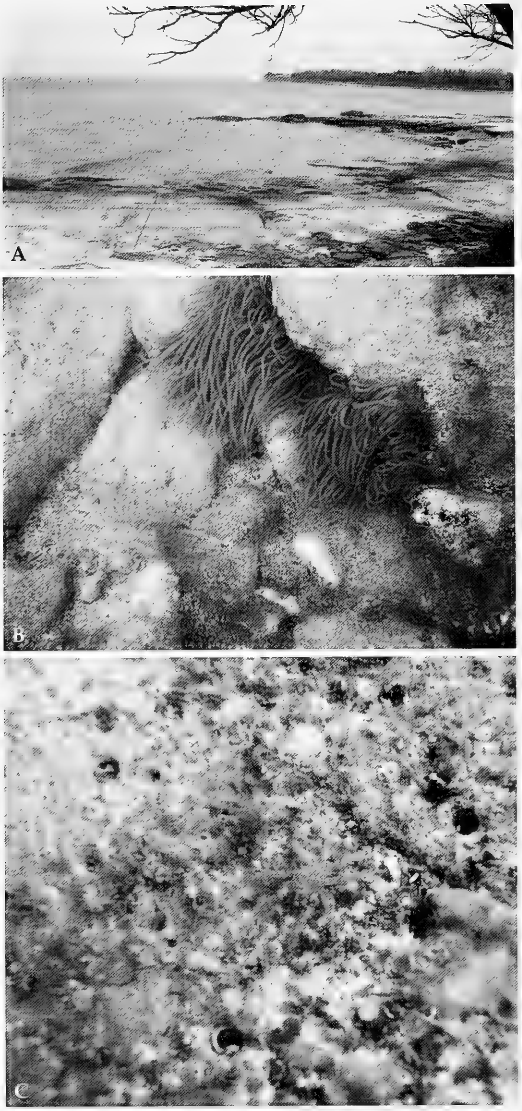

Fig. 1. A. The small bay at Cape Savudrija where our samples were collected. **B.** Underwater picture of the stones where the pycnogonids were found, and *Anemonia viridis* in between. **C.** *Achelia langi* at its original place under a stone bearing a layer of biogenous limestone with various benthos organisms. Note very similar colour of stone and pycnogonid (all pictures were taken in April 2005).

viduals sitting under the examined stones were collected. For documentation we used Canon Ixus 400 and Olympus 8080 digital cameras.

The collected Ammotheidae

Achelia langi (Dohrn, 1881)

Material:

3.9.2004: 3♀♀, A20042378 (Bavarian Sate Collection's storage number), A20042375 and A20042374; 2♂♂, A20042373 and A20042378.

8.10.2004: 1♀, A20050117, 1♀ with developed eggs, A20050112; 1♀ with chelae and developed eggs, A20050115; 2♂♂, A20050111 and A20050113; 2 egg-carrying ♂♂, A20050115 and A20050114.

25.1.2005: 1♂, A20050118.

24.4.2005: 4♀♀, A20051895, A 20051894, A20051897 and A20051898; 1♂ carrying eggs; 1♂, A20051901; 3 juveniles, A20051899, A 20051896 and A20051895.

22.5.2005: 2♂♂, A20051906 and A20051904; 5 juveniles, A 20051905, A20051908, A20051900, A20051903, and A20051907.

8.8.2005: 6♀♀, A20051963 and A20051961; 1 egg-carrying ♂, A20051961; 5♂♂, A20051961.

15.8.2005: 1♀, A20051965.

Additional material from the Rovinj area:

6.10.2004: 1♀, A20050129 (under stone at Punta Currente, at a depth of approx. 1.5 m).

9.8.2005: 1♂, A20051966 (under stone in Cross Bay, at a depth of approx. 0.5 m)

Remarks. In previous samples, *Achelia echinata*, *A. simplex* and *A. vulgaris* have been found along the Northern Adriatic East coast with *A. echinata* being the most common species of this genus (Zavodnik 1968, Krapp-Schickel & Krapp 1975, Krapp 1975, Schüller 1989), but not *A. langi*, and hence this species is new for the area, probably because the applied collection technique has not been used there before. In our samples, *A. langi* is the most abundant under-stone-pycnogonid (72 % of the whole sample). Altogether, we found 42 individuals, 17 of these are ♀♀, 17♂♂ and 8 are juveniles. 4♂♂ were carrying eggs. Remarkably the latter were found in April, August and October, i.e. in various times of a year, while juveniles were only found in April and May. We found one ♀ still having chelae but already bearing eggs in her legs in October. We have two additional individuals of *Achelia langi* from the Rovinj area, where we also found them under stones.

Ammothella appendiculata (Dohrn, 1881)

Material:

8.10.2004: 1♀, A20051891.

28.12.2004: 1 juvenile, A20051892.

22.5.2005: 1 egg carrying ♂, A20051890.

Remarks. *A. appendiculata* has also been found by Krapp-Schickel & Krapp (1975) and Schüller (1989) in the Rovinj area. However, this species is quite rare in their collections. The three individuals we found represent 5 % of our sample.

Ammothella longioculata (Faraggiana, 1940)

Material:
3.9.2004: 1♂, A 20042376; 1 juv., A 20042377.
8.8.2005: 2♂♂, 1♀ with eggs in femur, A20051962; 3 juveniles, A20051960.

Remarks. This species has been found in the Northern Adriatic for the first time by Schüller (1989), and in general has been seldomly collected in the Mediterranean (earlier reports are summarized in Schüller 1989). Our 8 specimens confirm Schüllers (1989) observation. However under stones this species is not as rare as one might think, as almost 14 % of the whole sample is made by *A. longioculata*.

Ammothella biunguiculata (Dohrn, 1881)

Material:
8.10.2004: 1♀, A20050120; 1 juv., A20050121.
25.1.2005: 1♂, A20050119.
8.8.2005: 2 juveniles, A 20051964.

Remarks. This species has also been found in this area for the first time by Schüller (1989). She could find only one single juvenile. In our samples we have five individuals of this species, i.e. 8% of the whole sample. Hence this species as well is more common under stones than in other habitats.

Conclusions

Under stones at Cape Savudrija a pure ammotheid community is present. The three *Ammothella* species were rarely found in earlier studies. *Achelia langi*, the most common species in our samples, is new to the Croatian Northern Adriatic coast. This indicates that *A. langi* might have been overseen in the past because of the applied sampling techniques. This also accounts for our other ammotheids, and hence it seems that "rareness" does not necessarily mean rareness of the respective species here: if the appropriate "sample trick" is not applied, a quite common species can be overseen. In other words, it seems that we have found a facet of the habitat of the collected species that was not studied before.

This might explain the differences in species composition and relative abundance between the present study and earlier works. E.g., in Schüllers (1989) study, where most specimens were collected from infralitoral algae, ammotheids represent 10 % of the whole sample, while ours completely consists of ammotheids. 72 % of these are *Achelia langi*, the remaining 28 % of the collected pycnogonids are *Ammothellas*, while Schüller had less than 3 % *Ammothellas* in her sample. In addition in Schüller's sample about 80 % of the collected ammotheids are *Achelia echinata*. The latter species is generally seen as a quite common *Achelia*. Under stones, however, we haven't found a single individual of this species, but *Achelia langi* takes the place of the most common ammotheid and the dominant species of our whole sample.

What might be the reason why ammotheids sit under stones at cape Savudrija? Generally the stones might be resting sites or foraging grounds or both. Our qualitative habitat description (see above) indicates that with algae on top and at the sides of the stones, with the Anemonias between them, and the coelenterates, bryozoans and other dim light benthos organisms growing under the stones, potential food for the collected ammotheids is present very close to the places where we found them.

References

Dohrn, A. 1881. Die Pantopoden des Golfes von Neapel und der angrenzenden Meeresabschnitte. – Fauna und Flora des Golfes von Neapel und der angrenzenden Meereabschnitte **3**: 1-252

Faraggiana, R. 1940. Pantopodi del Mare Ligure. – Boll. Mus. Zool. Anat. Comp. R. Univ. Torino (Ser. 3) **48**: 145-158

Krapp, F. 1973. Bathyale und zirkalittorale Pantopoden (Pycnogonida) aus dem adriatischen und Ligurischen Meer, mit *Callipallene acribica* n. sp. – Bonn. Zool. Beitr. **26**: 280-290

Krapp-Schickel, G. & F. Krapp 1975. Quelques traits de l'écologie d'Amphipodes et de Pycnogonides provenant d'un ilot nord-adriatique. – Vie Milieu **25**: 1-31

Schüller, S. 1989. Die Pantopodenfauna von Rovinj (Nördliche Adria) und der Jahreszyklus einiger Arten. – Bonn. Zool. Beitr. **40**: 285-296

Zavodnik, D. 1968. Beitrag zur Kenntnis der Asselspinnen (Pantopoda) der Umgebung von Rovinj (Nördl. Adria). – Thalassia Jugoslavica **4**: 45-53

3. Hellmann, F. & E. Bertaccini: I Macrolepidotteri della Valle Susa – Italia Nord-occidentale (Alpi Cozie-Graie). Monografie XL; Regione Piemonte, Torino, 2004. 389 S., 16 Farbtaf., hardback. ISBN 88-86041-58-6

Die beiden gut bekannten und um die Erforschung der norditalienischen Schmetterlingsfauna verdienten Autoren führen den Leser mit diesem schönen Buch in eine der artenreichsten Lokalfaunen Europas ein und können eine beeindruckende Bilanz präsentieren: Die Ergebnisse von 8 Jahren (1996-2003) intensiver entomologischer Sammelarbeit im Susa-Tal in der westlichen Piemonte erbrachten auf einer relativ kleinen Gesamtfläche von nur etwas mehr als 1000 km^2 sage und schreibe 1159 Großschmetterlingsarten! Das sind mehr Arten, als in der nahe gelegenen und dreifach größeren Region Valle d'Aosta festgestellt wurden. 43 dieser Arten sind neu für die Fauna der Region Piemonte. Für die Korrektheit der Determinationen – für Fauneninventare unerläßlich, wenn auch leider nicht selbstverständlich – bürgt der Fleiß der Autoren, die es zudem verstanden, eine Vielzahl von Spezialisten in die Entstehung dieser Faunenliste miteinzubeziehen.

Die einleitenden Kapitel stellen – in italienischer Sprache – Geographie, Geologie, Klima und Vegetation des Untersuchungsgebietes vor. Der Leser findet hier auch eine Liste der 130 Fundorte mit Höhenangaben und genau nachvollziehbarer Lokalisierung. Weitere allgemeine Kapitel behandeln Ökologie und 'Corotypen' nach dem System von Vigna Taglianti, sowie methodische Aspekte.

Im Hauptteil des Buches werden die Arten in systematischer Reihenfolge nach folgenden Kriterien charakterisiert: Corotyp, Ökotyp, manchmal mit detaillierteren Habitatangaben, Phänologie, Höhenverbreitung, relative Häufigkeit, detaillierte Verbreitungsdaten innerhalb des Untersuchungsgebietes.

Auf ansprechenden Farbtafeln wird eine Auswahl der 315 interessantesten Arten abgebildet, mit insgesamt 412 Faltern. Die Dokumentation einiger weiterer Besonderheiten, z.B. *Scopula corrivalaria*, *S. emutaria* und anderer wäre hier eventuell noch wünschenswert gewesen.

Das Buch ist hervorragend recherchiert und korrekturgelesen, und es konnte trotz intensiver Lektüre praktisch nichts festgestellt werden, was zu bemängeln wäre. Wenn es nur mehr derartige Bearbeitungen gäbe! Lediglich die Inkonsistenz bei der Handhabung der 'gender agreement'-Regelung der wissenschaftlichen Artnamen fiel dem Rezensenten auf: Meist folgen die Autoren der Empfehlung der SEL, die Artnamen entgegen der buchstäblichen Anwendung des Codes in der ursprünglichen Schreibweise zu belassen und nicht an das Geschlecht des Gattungsnamens anzupassen. In einigen Fällen, z.B. bei den Geometriden-Arten der '*Gnophos*-Gruppe', die jetzt z.T. in *Charissa* und anderen Gattungen stehen, sind die Artnamen, entgegen der Erstbeschreibung, unerklärlicherweise fast durchwegs in maskuliner Form aufgeführt.

Man kann das Buch direkt vom Museo Regionale di Scienzia Naturale beziehen (Via Giolitti, 36 – I-10123 Torino Italy). A. Hausmann

4. Wilson, R. S., Hutchings, P. A. & C. J. Glasby (eds.): Polychaetes. An Interactive Identification Guide. CSIRO Publishing, Collingswood/Australia, 2003. CD-ROM. ISBN 0-643-06702-7

Polychaetes are one of the most important groups of benthic marine organisms, yet usually underrepresented by field studies and excursion due to the notorious difficulties to identify them. This is true particularly for the beginner. The present contribution wants to overcome this problem by offering an interactive key – and to say it in short, the aim has been reached. We tested the CD-ROM during our last excursion at the North-East Atlantic and found it extremely useful, although the species part focuses on Australian waters: Within a week students were able to identify practically each specimen down to the minor taxon (family or genus) available in the key.

The general part provides an overview on polychaetes and other "worm" taxa (to exclude them from further treatment) including collection methods, basic classification, and synonyms of families. Systematics is based on Rouse & Pleijel (2001: Polychaetes. Oxford Univ. Press), the latter is indeed the printed counterpart of the present contribution and focuses on polychaete phylogeny. The core of the CD-ROM is the interactive key which includes all currently recognized families which are listed, illustrated and diagnosed. One of the very strength is the extensive illustration of all characters found in the keys and of many typical taxa. It depends on the problem and the will of the user, whether one prefers to browse over the families (worldwide), genera and species (more or less restricted to Australian waters), or to directly use the key options to determine the actual sample. Both is highly recommended and the CD-ROM which is also a perfect addition to the systematic overview of the Fauna of Australia Volume on polychaetes. Each family is treated by description, identification tips, natural history, diversity, checklist, references and the interactive key combined with highly instructive drawings – a perfect combination useful for the beginner and the professional.

System requirements (Windows 98, ME, NT, XP or higher; Pentium 166 or better, SVGA monitor 800 × 600, Internet Explorer 5 or later, CD-ROM drive) are standard today even for notebooks or laptops.

To summarize this review: I regard this CD-ROM as an extremely useful tool for students and their teachers and as a must for each course or excursion in marine biology or systematics. G. Haszprunar

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A new *Astraea* from Bali, Indonesia

(Mollusca, Prosobranchia, Turbinidae, Turbininae)

Axel Alf & Kurt Kreipl

Alf, A. & K. Kreipl (2006): A new *Astraea* from Bali, Indonesia (Mollusca, Prosobranchia, Turbinidae, Turbininae). – Spixiana **29/1:** 91-93

A new species of the genus *Astraea* Röding, 1798, subgenus *Astralium* Link, 1807 from Bali (Indonesia) is described and compared with *Astraea (Astralium) semicostatum* (Fischer, 1875).

Prof. Dr. Axel Alf, University of Applied Sciences Weihenstephan, 91746 Triesdorf, Germany

Kurt Kreipl, Meeresmuseum, Höhenweg 6, 74613 Öhringen, Germany

Introduction

During their research on material of Turbininae the authors found a sample of small *Astraea*'s which were collected 1978 at Tanah Lot, Bali, Indonesia in shallow water. The species could not be identified as a known species and therefore is described here as new.

Astraea danieli, spec. nov.

Figs 1, 3

Types. Holotype: height 13.7 mm, width 15.1 mm, in Zoologische Staatssammlung, München (ZSM Moll 20050941). – Patatypes [height/width in mm]: No. 1-7 in collection Kreipl, Öhringen: p1: 15.6/17.0; p2: 15.5/16.1; p3: 16.3/15.6; p4: 9.9/13.5; p5: 16.0/17.5; p6: 16.4/16.8; p7: 16.2/17.0; no. 8-12 in collection Alf, Weidenbach: p8: 12.7/14.6; p9: 16.5/15.5; p10: 11.9/14.2; p11: 10.1/13.0; p12: 16.7/15.7; no.13 in Senckenberg-Museum, Frankfurt: p13: 15.8/16.6; no. 14 in collection Dekker, Winkel, The Netherlands: p14: 16.1/16.6; no. 15-19 in collection Hemmen, Wiesbaden: p15: 15.0/16.0; p16: 15.2/15.5; p17: 14.7/16.2; p18: 15.4/15.5; p19: 15.3/15.7.

Type locality. Tanah Lot, Bali, Indonesia. In shallow water on rocks with algae.

Etymology. The species is named after the senior author's son Daniel Alf.

Description

Shell very small, coniform, adults reaching a size of about 16 mm, thick shelled, most shells taller than wide (h/w = 0.73-1.06, mean 0.93).

Teleoconch of about 5 whorls which are concave to straight on the early whorls and straight to convex on the last whorls. Whorls with axial ribs (10-12 on the body whorl) which may cross the whole whorl and be connected from whorl to whorl or may be reduced to short riblets. Besides this the whorls are sculptured with irregular, incised growth striae.

Base straight, umbilical area slightly depressed, periphery rounded. Sculpture of base consisting of microscopic growth striae and one spiral row of tubercles which are well expressed in juvenile specimens and may almost fade away in adult specimens.

Suture incised, first whorls slightly overhanging the following whorl.

Columella evenly rounded with one tooth at the base and one or more weak denticles on the basal lip. No umbilicus.

Colour of the shell greyish with a greenish touch to dark olive green, base slightly lighter; ribs on the whorls white. Inner part of the columella nacreous, outer part light blue. Edge of the lip also light blue. Aperture nacreous within.

Operculum oval, smooth to slightly rough, relatively thick with the outer edge depressed. Colour

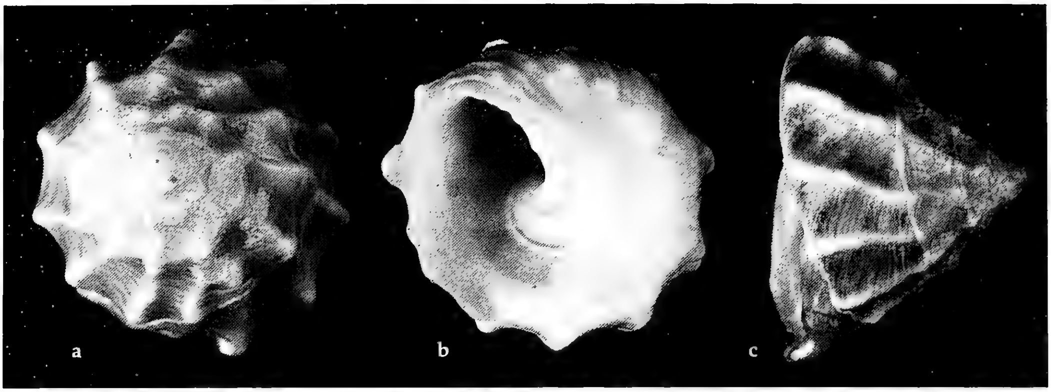

Fig. 1. *Astraea (Astralium) danieli*, spec. nov. Holotype. **a.** View from top. **b.** View from base. **c.** View from side.

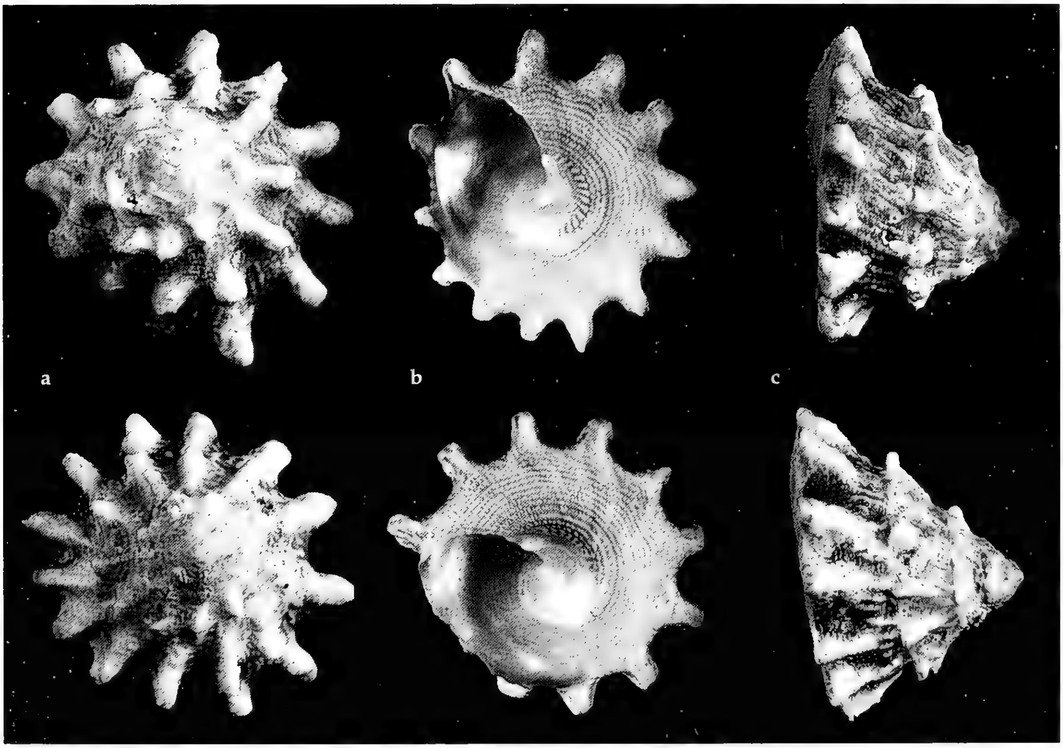

Fig. 2. *Astraea (Astralium) semicostatum* (Fischer, 1875). **a.** View from top. **b.** View from base. **c.** View from side.

bluish white, the outer edge dark blue, sometimes with blue growth striae.

Distribution. Only known from the type locality at the island of Bali, Indonesia, in shallow water.

Discussion

The only species which shows any similarity with *Astraea (Astralium) danieli*, spec. nov. is *Astraea (Astralium) semicostatum* (Fischer, 1875) which has much stronger ribs and additional riblets between these, a sharply angled periphery, a base with well expressed spiral rows of crescent shaped lamellae, and

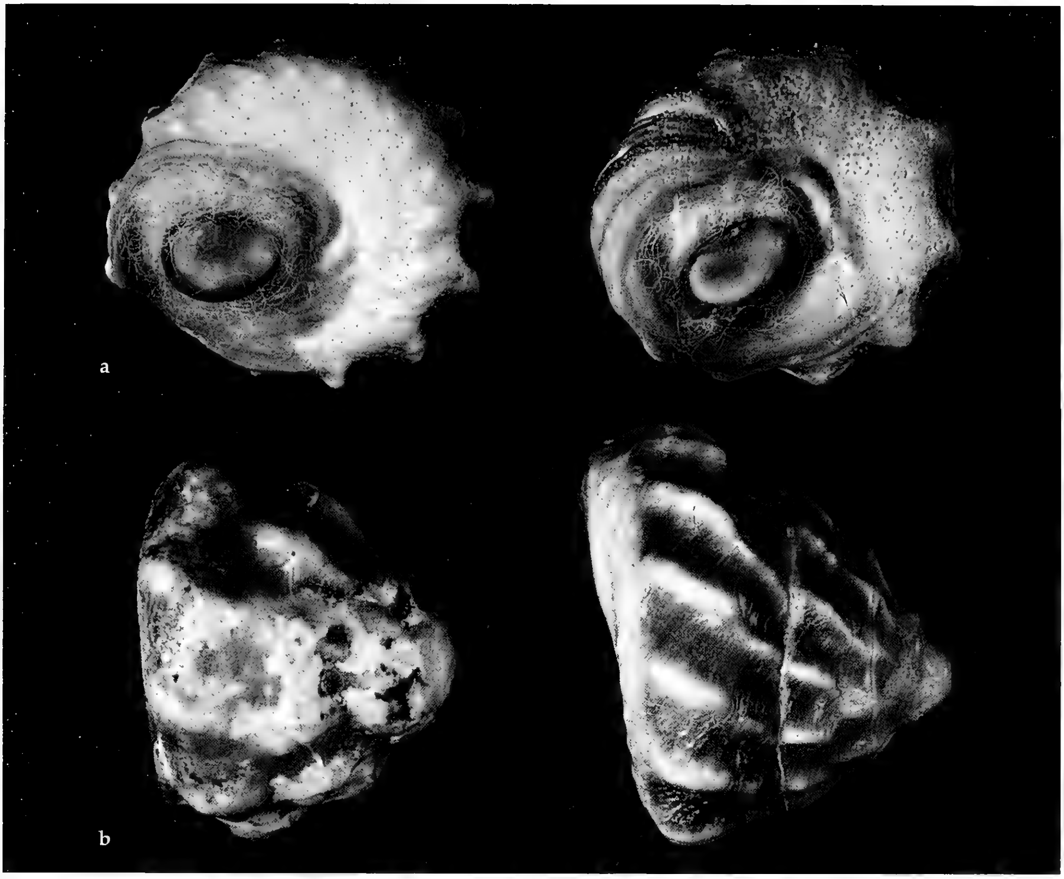

Fig. 3. *Astraea (Astralium) danieli*, spec. nov. **a.** Bases of paratypes 5 (left) and 7 (right), in paratype 5 the tubercles are well visible. **b.** Paratypes 5 and 7, view from side.

which is larger at the average. *Astraea (Astralium) stellare* (Gmelin, 1791) also has a blue umbilical area and operculum but is much larger (up to 50 mm), has an angulate periphery, a base with rows of semilunular lamellae and relatively larger axial ribs which give the base a star-like appearance. *Astraea (Astralium) aureum* (Jonas, 1844) has a yellowish operculum and base and is restricted to Australia.

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References

Abbott, R. T. & S. P. Dance 1998. Compendium of Seashells (6th edition). – Dutton, New York

Dharma, B. 2005. Recent and Fossil Indonesian Shells. – Conchbooks, Hackenheim

Philippi, R. A. 1846. Die Kreiselschnecken oder Trochoideen. – Bauer und Raspe, Nürnberg

Pilsbry, H. A. 1888. Phasianellidae, Turbinidae, Delphinulinae. In: Tryon, G. W. & H. A. Pilsbry: Manual of Conchology, vol. X. – Academy of Natural Sciences, Philadelphia

Reeve, L. A. 1862. Conchologia Iconica, vol. XIII. – Reeve, Benham & Reeve, London

Sowerby, G. B. 1887. Thesaurus Conchyliorum, vol. V. – London

5. Ponder, W. F., Clark, S. A & M. J. Dallwitz: Freshwater and Estuarine Molluscs. An Interactive Illustrated Key for New South Wales. – CSIRO Publishing, Collingswood/Australia, 2000. CD-ROM. ISBN 0-643-06578-4

System requirements (Windows 95, NT or higher; Pentium 166 or better, SVGA monitor 800 × 600, CD-ROM drive) are standard today even for notebooks or laptops.

This is a tool from specialists to specialists focusing on the freshwater and estuarine molluscs of New South Wales (Australia), all in all close to 350 species. "Estuarine" is meant in a very broad sense; thus the key includes bivalve taxa like Solemya, Pinna, ostreids, lucinids, galeommatids, cyamoideans or psammobiids, and gastropod taxa like trochids, naticids, epitoniids, many pyramidellids or aplysiids, which are usually considered as "marine" taxa. The key itself is associated by a manual (MS-Word file), and the latter is required indeed by the beginner.

Each taxon is described and illustrated (drawings and colour photos of shell and often also the living animal) in detail, distribution information, synonyms, common names (if available), references on the species or family are included. I personally tried the key and found it a little bit circumstantial though the correct taxon has been reached. However, the present contribution is useful only for the region given in the title, other freshwater or estuarine faunae are largely neglected at all, also on the supraspecific level of systematics.

To summarize this review: I regard this CD-ROM as a useful tool for biology students and teachers in South-Eastern Australia. Non-Australian scientists might be inspired to produce a similar tool on their local molluscan faunae. G. Haszprunar

6. Schmidt, G.: Die Vogelspinnen. Eine weltweite Übersicht. – Westarp Wissenschaften, Hohenwarsleben. Die Neue Brehm-Bücherei, Bd. 641, 2002. 383 pp. ISBN 3-89432-899-1

Vogelspinnen – schon immer ging von diesen riesigen, besonders gefährlich und wehrhaft anmutenden tropischen Spinnen ein besonderer Reiz aus – wenngleich die reale Gefährdung des Menschen durch Vogelspinnen, mit Ausnahme von gelegentlichen allergischen Reaktionen auf ihre Haare, oft beträchtlich überschätzt wird. Wie auch immer: Vogelspinnen sind nicht nur für Zoologen, sondern auch für viele Terrarianer und sonstige Amateure interessant und werden gerne und häufig gehalten, was seit längerem für viele Arten eines Herkunfts- bzw. Zuchtnachweises bedarf. Der Autor des vorliegenden Buchs, Günter Schmidt, erhielt seine ersten Vogelspinnen aus Südamerika im Jahre 1952 als sogenannte "Bananenspinnen", d.h. sie waren, wie es bei einigen anderen tropischen Spinnengruppen ebenfalls nicht selten vorkommt, mit einer Bananenlieferung nach Deutschland "geschickt" worden. Seither hat sich der Autor zu einem der maßgeblichen Vogelspinnenkenner mit etwa 170 Publikationen über diese Spinnengruppe entwickelt.

Das vorliegende Buch ist eine Neubearbeitung dieses Themas und bietet eine aktuelle – und wohl zur Zeit auch die kompletteste – Gesamtübersicht der Vogelspinnenkunde in deutscher Sprache.

Hierzu gehören Kapitel über die systematische Stellung der Vogelspinnen, ihre Morphologie, Verbreitung, Lebensweise und Giftigkeit. Ausführliche Angaben über die Haltung, Fütterung und Zucht von Vogelspinnen dürfen natürlich ebenfalls nicht fehlen.

Das Buch gefällt aber insbesondere durch einen ausführlichen und brauchbaren Bestimmungsteil. Familien, Unterfamilien und z.T. einzelne Arten werden detailliert besprochen und charakterisiert. Bestimmungsschlüssel mit gut gemachten Zeichnungen erlauben die Bestimmung bis zu den Gattungen, die Bestimmung der Arten erfolgt dann anhand der – für die Belange eines Zoologen allerdings zu kurz gehaltenen – Diagnosetexte bzw. der beigefügten Zeichnungen. Immerhin werden hier aber komplette Artenlisten inclusive der Herkunftsgebiete der Tiere geboten.

Insgesamt ist das neue Buch von Günter Schmidt in der "Neuen Brehm Bücherei" sehr gut plaziert und bietet eine umfassende Basisinformation für den Spezialisten, wie auch ein anspruchsvolles Standard- und Nachschlagewerk für den ambitionierten Amateur.

Der Text des Buches wie auch die Vielzahl der Abbildungen sind sehr gelungen und informativ, wobei der Autor gänzlich auf rein plakative Aufmacher verzichtet hat und die Sachinformation absolut in den Vordergrund stellt. Dies ist bei einer Tiergruppe, über die derartig viele falsche Vorstellungen grassieren, ein besonderes Verdienst. Ich kann deshalb das Buch ohne Einschränkung dem weiten Kreis der Vogelspinnenliebhaber zur Lektüre und als Nachschlagewerk empfehlen.

R. Melzer

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In Memoriam Claude Herbulot

***19.2.1908 – 19.1.2006†**

Axel Hausmann & Manfred Sommerer

In the late evening of January 19th, 2006, Claude Herbulot passed to his rest, only one month before his 98th birthday.

At the same time, in the evening after the opening session of the 4th Forum Herbulot at Hobart University in Tasmania on January 19th, 2006, the participants to the meeting were operating several light-traps at 1000 m near the timberline up Hobart's Mt. Wellington. It was a wonderful warm night yielding many fine Geometrids among which a hitherto nondescript green *Chlorocoma* species was especially appreciated by the authors of these lines as good news to the patron of the meeting. Claude Herbulot had much liked Cathy Young's and Peter McQuillan's idea to organize this Forum Herbulot in Tasmania and to combine it with ample collecting opportunities at selected habitats: Australia was the one continent Claude Herbulot never had a chance to visit himself for collecting. Until his very last conscious moments on earth, as was noted by his nearest, the Forum Herbulot "down under" and the perspective of having an intriguing gap in his collection finally closed was on his mind. We are glad that this last wish of Claude Herbulot can be fulfilled in a way that certainly would have pleased our dear friend. Fine specimens of more than a third of the 310 Geometrid species known from Tasmania now enrich the Collection Herbulot at the ZSM (marked by a special white label). Moreover, the organizers of the 4th Forum Herbulot, Cathy Young and Peter McQuillan, on behalf of all participants, will dedicate to Claude Herbulot the above mentioned new *Chlorocoma* species when they will describe it.

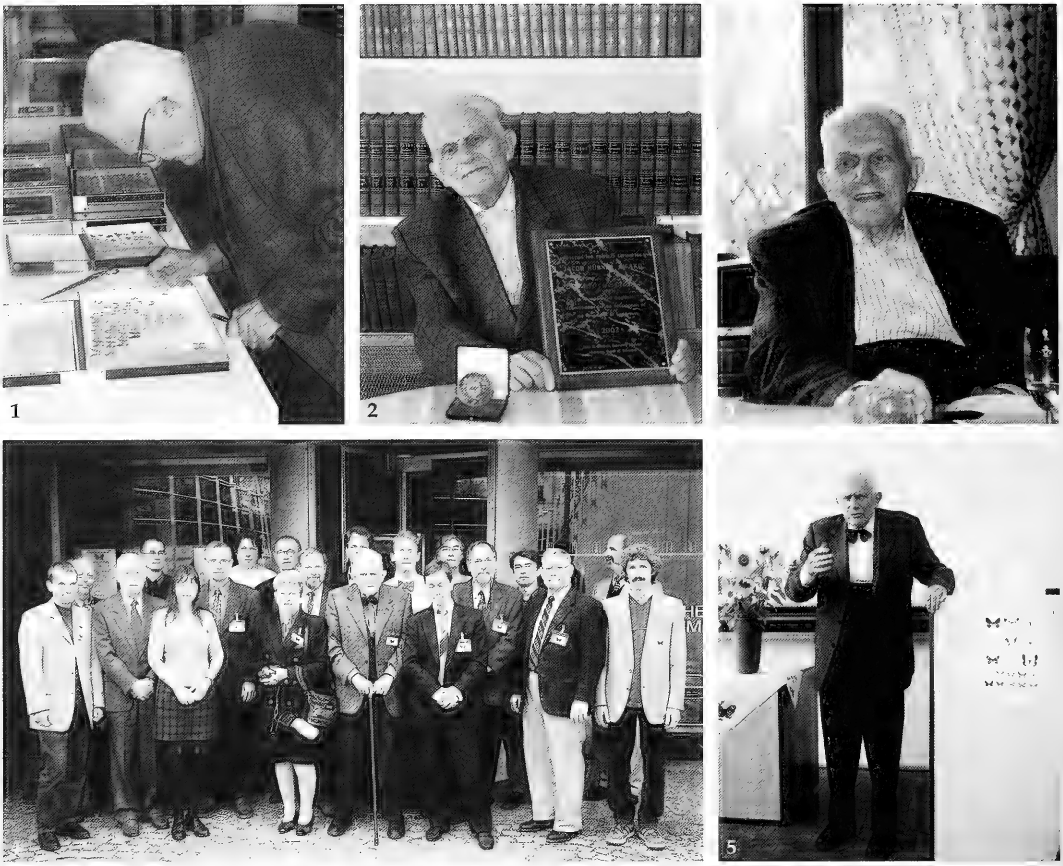
The outstanding lepidopterist Claude Herbulot was honoured by his friends and colleagues with a great number of patronyms: three genera and 29 species in the family Geometridae, but also many a taxon in other insect families and orders. To Geometrid taxonomy and systematics he contributed, starting in 1930, altogether 286 scientific publications, the latest one dating from 2005! As Scoble (1995) acknowledged, the known biodiversity of the Geometridae worldwide owes him alone about 5% of the named valid species. With D. S. Fletcher, L. B. Prout, and W. Warren he shares the collective responsibility for describing around 75 % of the known Afrotropical Geometrid species, and Claude Herbulot, L. B. Prout and P. Viette described even 80 % of the species known from Madagascar (Scoble et al., Using taxonomic data to estimate species richness in Geometridae, J. Lepidopterists' Soc. 49, 1995: 136-147).

During the last months he accomplished, with the help of his daughters Christiane and Hélène, a complete list of his publications in form of a data file (available on the web-site of the Forum Herbulot).

In many a phone call, when he needed some information from the collection that is housed at the ZSM since February 2000, he stunned his partner by the precise recollection of details which he could not have seen for years: On a postcard from his last cruise in the Mediterranean in 2002 he wrote "Today we are at Corfu island. Have a look into the box no. 839, under the species *Ematurga atomaria*, 11th row, last specimen: This was collected on Corfu island by a French Marshal on the 1st of April 1916, in the First World War, during the battle of the French army against the K&K troops." In his late years he would sometimes complain about his failing memory of species names, but at the same instant quoting the complete row of synonyms to that species including their years of publication!

It was a pleasure to listen to his well founded remarks on all kinds of questions linked with Geometrids, and of course, the background information gathered during a long life from the acquaintance with the peers of entomological research and collecting. What a pity that the wealth of the stories which he could tell, often with a charming boyish smile, were never written down! For instance, when asked about the strange discolorations in the cover of some of his store boxes he would take pleasure to astonish the listener by pointing out that the French collector Balestre used to put raw meat upon those boxes to feed his ravens. And that the same Balestre, fatally in love with the wife of the Austrian lepidopterist and pianist Gieseking, had shot Gieseking "by accident" during a hunting party and committed suicide in the course of the trial. His collection was then purchased by D. Lucas whose collection was sold to the Natural History Museum of Paris which, however, could not afford to buy the whole lot so that Claude Herbulot could acquire the Geometrids. Voilà! So the vicissitudes of life, often associated with the specimens in a rich collection, even emanate from the external implements of the Collection Herbulot.

Claude Herbulot was decorated with the Jakob Hübner Award of the Association for Tropical Lepidop-



Figs 1-5. 1. Claude Herbulot at work with his collection. **2.** CH at his home in Paris with Spix Medal (ZSM) and Jakob Hübner Award (ATL). **3.** CH at the ZSM during the official cerimony of the transfer of his collection to Munich. **4.** C.H. with his wife Colette and the participants of the first Forum Herbulot 2001 at the ZSM. **5.** CH speaking at the official cerimony of the transfer of his collection to Munich (ZSM).

tera (Florida) and the Spix Medal of the Friends of the ZSM. But he was more than a great lepidopterist: he was a great learned man. With his law degree (licence en droit), he worked for the French Sugar Association during his professional life. His interests and precise knowledge in classical history, literature, poetry, and art were extraordinary and reflected in precious volumes of his rich personal library. At the conference dinner of the Forum Herbulot in Munich (2001) he impressed the party by reciting long passages of Homer's Ilias in the original Greek. But he was also proud to have been a good athlete during his young years. Finally, there is now a French moth named in allusion to this fact (*Idaea dromikos*: cf. Hausmann, The Geometrid Moths of Europe 2, 2004: 220). Detailed additional information on the life of Herbulot is published in French language by Philippe Darge (Bull./Ann. Soc. Ent. Fr. 2006), and by Joël Minet (Nota lepidopterologica 29 3/4).

He leaves us not only an amazing collection (cf. Hausmann, Die Sammlung Herbulot, Paris, in: Jahresbericht 2000 der Generaldirektion der Staatlichen Naturwissenschaftlichen Sammlungen Bayerns, 2001: 27-30), which ranks among the finest in the world, and a wealth of scientific publications but also, and perhaps most of all, the memory of a charming, wise, and reliable good friend. We will miss him much. RiP!

De toutes les belles choses
Qui vous manquent en hiver
Qu'aimez-vous mieux? – Moi les roses;
– Moi, l'aspect d'un beau pré vert;

– Moi, la moisson blondissante,
Chevelure des sillons;
– Moi, le rossignol qui chante;
– Et moi, les beaux papillons.

Gérard de Nerval

(poem taken from the book of prayers of the funeral cerimony, Paris, Saint-Bruno d'Issy-les-Moulineaux, 25.1.2006)

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About *Aenictosoma doenitzi* Schaufuss, 1891

(Coleoptera, Cerambycidae, Scydmaenidae)

Francesco Vitali

Vitali, F. (2006): About *Aenictosoma doenitzi* Schaufuss, 1891 (Coleoptera, Cerambycidae, Scydmaenidae). – Spixiana **29/2:** 99-101

Aenictosoma doenitzi Schaufuss, 1891, a beetle included in the Baltic amber and doubtfully described as a cerambycid, has all typical characters of Scydmaenidae, Mastiginae, Clidicini, to which tribe it is herewith transferred. Hypotheses of its palaeological history are outlined.

Dr. Francesco Vitali, Corso Torino 5/7, I-16129 Genova, Italy

Introduction

Old descriptions of fossil beetles often bring the problem of misconceptions about the ancient Fauna. Some entomologists, diverted by the very quick evolution of Mammalia, also considered the amber Microfauna very different from the current one. Moreover, being unaware of Wegener's theories and the glacial events, they did not research the extant descendants of fossil species in areas where it was more logical to find them. Although eminent coleopterists (Reitter, Wickham, Zang) noticed that most amber Microfauna had close affinities with the recent fauna, some non-specialists described fossil species tending to create absolutely original genera.

Aenictosoma doenitzi Schaufuss, 1891 belongs to this category: originally described as an unusual longhorn beetle (its name means "doubtful body"), it has no cerambycid characters and belongs actually to another, quite different family.

Material and methods

Schaufuss (1891) described *Aenictosoma doenitzi* according to one specimen (n. 87) belonging to Dr. Otto Helm's collection, at that time deposed in the Museum of Danzig (today Gdañsk). Later, Helm himself (1897) and Handlirsch (1907) recorded this species without adding systematic considerations. Korschefsky (1939) provided the drawings of Schaufuss's types that their author did not publish for unknown reasons by then, but *Aenictosoma doenitzi* is not included. Still Spahr's (1981) and Carpenter's treatises (1992) reported this species as cerambycid.

In Danzig Helm's collection is no longer present today (Szadziewski in litt.). Most eastern German collections were transferred to other German Museums during World War II but in Berlin, Hamburg, Göttingen and Stuttgart this collection has not been found (Bechly, Reich, Neumann, Waitschat in litt.). Even if still present somewhere, the type could be no longer recognisable as such. Nonetheless, its accurate description permits a good identification of this species.

In this paper the geological dates agree with the GeoWhen Database of Physics Department, University of California at Berkeley (USA), according to the 2004 time scale endorsed by the International Commission on Stratigraphy.

Discussion

Already to Schaufuss *Aenictosoma doenitzi* looked like a very unusual longhorn beetle: he selected for it the name *Aenictosoma* and doubtfully inserted it within Cerambycidae.

Only at the first reading this species should not evidently belong to this family. Its palpi with "apice acuminato" could let one suppose that this is a representative of the subfamily Lamiinae but other characters take off all doubts.

Its antennae "*geniculatae ... articulo ... 2°-10°*

elongatis, filiformibus ... longitidine decrescentibus, latitudine vix crescentibus" (elbowed, antennomeres II-X elongated, progressively shorter and enlarged toward the apex) are never found within Cerambycidae.

Its 5-jointed tarsi with "*primi quattor decrescentibus, conici ... angulis anticis utrinque acutis*" (tarsomeres I-IV progressively shorter, toothed at each apex) clearly indicate its belonging to a pentamerous family.

Its very long maxillary palpi are very typical: palpomere II long, thin, club-shaped; palpomere III perpendicularly inserted on the II one, slightly shorter than the II one, elongate-conical, enlarged at the apex; palpomere IV shorter and a bit thinner than the II one, acuminate at the apex. They do not remind those of Cerambycidae but those of some terricolous families (Carabidae, Staphylinoidea).

This black species, 7.3 mm long, is also characterised by constricted neck, globose thorax, very small scutellum, deeply striated and convex elytra, club-shaped femora and abdomen with 6 ventrites. This character set does not correspond to any known cerambycid genus.

The general habitus suggested to Schaufuss a feeble resemblance with the genus *Moluris* (Tenebrionidae, Pimeliinae). Nonetheless, for unknown reasons he preferred to insert it among Thomson's "Metaulacnemiten" Cerambycidae (Lamiinae, Dorcadionini, Parmenini, etc.).

On the contrary, all characters suggest its likeness to the Scydmaenidae (antlike stone beetles). The not-clubbed antennae indicate relations to the subfamily Mastiginae, while big size, elytral punctuation and elongate palpomere III suggest its relations to the tribe Clidicini.

The lack of the type does not allow to exactly locate the genus; nonetheless, the original description allows to draw some systematic considerations.

The lack of the bisetose cuticular projection on the maxillary palpomere II separates it from *Leptochromus* Motschulsky, 1855. Bigger size, elongate antennomeres II-X and elliptic maxillary palpomere IV separates it from *Palaeoleptochromus* O'Keefe, Pike & Poinar, 1997. The elongate shape of the antennomeres II-X and of the maxillary palpomere III separates it from *Clidicus* Laporte, 1832. Deeply striate elytra and elongate antennomeres II-X separates it from *Papusus* Casey, 1897. The longer scape (as long as the antennomeres II-IV together) separates it from *Palaeomastigus* Schaufuss, 1890.

Therefore, *Aenictosoma doenitzi* is here transferred to the Scydmaenidae Mastiginae Clidicini, near the genus *Leptochromus*. Nevertheless, other characters are too doubtful or not precise enough to allow further considerations. It is interesting to note that Schaufuss (1890) himself described one *Clidicus* and one *Palaeomastigus*-species from Baltic amber belonging to Helm's collection. Curiously, he did not notice the resemblance with these genera. Actually, Schaufuss himself revealed that he did not know the European *Mastigus*-species (= *Palaeostigus* Newton, 1998) but only the South-African ones. Moreover, *Aenictosoma* is difficulty classifiable in the systematics proposed by Schaufuss (1884, 1890) since he was not aware that some Mastiginae-genera could have an acuminate palpomere IV.

Already Schaufuss (1890) reported the presence of fossil Clidicini in Baltic amber through the description of *Clidicus balticus*. Although current entomologists have not checked if this (lost?) species effectively belongs to this genus, it is probable. According to O'Keefe (2002), *Clidicus* has been displaced from Europe to South-eastern Asia, where it is today widespread, during Late Eocene to Early Oligocene (37-28 Myr BP).

According to this author, the differentiation of American and Eurasian Clidicini occurred during Cretaceous or Tertiary. However, the presence of Clidicini-genera closely related to *Leptochromus* in Europe during Eocene (56-34 Myr BP) seems to be probable.

Recent distribution of Clidicini in America seems to correspond more with a Vancouverian areal than with an Alleghenian one, as one should expect. Nevertheless, the recent areal of *Leptochromus* (Central and northern South America) could be interpreted as a tropical refuge, relict of an Alleghenian palaeotropical areal. In fact, the presence of *L. palaeomexicanus* O'Keefe, 2002 in México during the Late Oligocene-Early Miocene (28-16 Myr BP) suggests that this genus was displaced from Alleghenian before this epoch. Likely, this fact occurred as consequence of the climatic cooling of the Early Oligocene (34-28 Myr BP).

In conclusion, *Aenictosoma doenitzi* was a Clidicini-species that lived in Baltic forests during Eocene. It was closely related to the American *Leptochromus*, a genus diverged from it during Cretaceous or Early Tertiary. As consequence of the Early Oligocene climatic cooling, it was displaced toward south-eastern Asia with *Clidicus* and many other Baltic genera. But, differently from this genus, it became extinct in following epochs.

Zusammenfassung

Aenictosoma doenitzi Schaufuss, 1891, ein baltisches, ursprünglich als Bockkäfer beschriebenes Fossil, weist alle typischen Merkmale der Familie Scydmaenidae, Unterfamilie Mastiginae, Tribus Clidicini auf, wohin es hiermit gestellt wird. Die vermutliche Entstehungs-und Verbreitungsgeschichte dieser fossilen Art wird diskutiert.

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The author thanks for the collaboration Dr. Günter Bechly, Staatliches Museum für Naturkunde Stuttgart (Germany), Ph. D. Steve W. Lingafelter, National Museum of Natural History, Washington (U.S.A.), Dr. Christian Neumann, Museum für Naturkunde, Humboldt-Universität, Berlin (Germany), Dr. Mike Reich, Geowissenschaftliches Zentrum der Universität Göttingen (Germany), Prof. Dr. hab. Ryszard Szadziewski, Museum of Amber Inclusions, University of Gdańsk (Poland), and Dr. Wolfgang Weitschat, Geologisch-Paläontologisches Institut, Universität Hamburg (Germany).

References

Carpenter, F. M. 1992. Treatise on Invertebrate Paleontology. Part R: Arthropoda 4. Volume 4: Superclass Hexapoda: 279-655. – Geological Society of America and University of Kansas. Boulder, Colorado and Lawrence, Kansas.

Handlirsch, A. 1907. Die fossilen Insekten und die Phylogenie der rezenten Formen. Ein Handbuch für Paläontologen und Zoologen. 1430 pp. – W. Engelmann Verlag, Leipzig

Helm, O. 1897. Thierische Einschlüsse im Succinit. Bericht über die 19. Wanderversammlung des westpreußischen botanisch-zoologischen Vereins zu Karthaus. – Schr. naturforsch. Ges. Danzig N.F. **9** (2): 88-89

Korschefsky, R. 1939. Abbildungen und Bemerkungen zu vier Schaufuß'schen Coleopteren aus dem deutschen Bernstein. – Arb. morph. taxon. Ent. **6** (1): 11-12 + 1 Tab.

Newton, A. F. & H. Franz 1998. World catalogue of the genera of Scydmaenidae. – Kol. Rundsch. 68: 137-165

O'Keefe, S. T. 2002. Revision of the Neotropical genus *Leptochromus* Motschulsky (Coleoptera: Scydmaenidae). – Syst. Ent. **27**: 211-234

– – , T. Pike & G. Poinar 1997. *Palaeoleptochromus schaufussi* (gen. nov., sp. nov.), a new antlike stone beetle (Coleoptera: Scydmaenidae) from Canadian Cretaceous amber. – Can. Ent. **129** (3): 379-385

Schaufuss, L. W. 1884. Die Scydmeniden Nord-Ost-Africa's, der Sunda-Inseln und Neu Guinea in Museo Civico di Storia Naturale zu Genua. – Ann. Mus. Civ. St. Nat. (Ser. 2, Vol. 1) **XXI**: 1-40 (387-426)

– – 1890. Die Scydmeniden des baltischen Bernsteins. – Numquam otiosus **III** (7-8): 561-586

– – 1891. Preußens Bernstein-Käfer. I. – Berliner ent. Z. **36** (1): 53-64

Spahr, U. 1981. Systematischer Katalog der Bernstein- und Kopal-Käfer (Coleoptera). – Stuttgarter Beitr. Naturk. (Ser. B.) **80**: 1-107

7. Lehane, M. J.: The Biology of Blood-Sucking in Insects, 2nd ed., Cambridge University Press, Cambridge, 2005. 321 pp. ISBN 0-521-54395-9 (paperback).

Man kennt zur Zeit etwa 14000 Arten von blutsaugenden Insekten, von denen etwa 300 bis 400 genauer untersucht sind. Aber diese Arten sind von ungeheuer großer Bedeutung für die Menschen, die sie einerseits direkt belästigen und ihnen Schmerzen verursachen, andererseits, da sie schwere und gefährliche Krankheiten übertragen. In dem vorliegenden Band, dessen erste Auflage 1991 erschienen war, ist die Biologie dieser bedeutsamen Insekten zusammengestellt. Dabei wurde der ursprüngliche Text gründlich überarbeitet und auf den neuesten Stand gebracht. Das Werk gliedert sich nach den Themen, die für blutsaugende Insekten typisch sind, wie zum Beispiel das Auffinden der Wirte, Besonderheiten der Verdauung, Wirt-Insekt Beziehungen und Übertragung von Parasiten. Daß immer wieder von Moskitos und Tsetse-Fliegen die Rede ist, liegt nicht an einer einseitigen Betrachtungsweise, sondern einfach daran, daß über wenige Arten besonders viel geforscht wurde. Das Werk bemüht sich aber, wo immer möglich, grundsätzliche Probleme und Themen aufzuzeigen, es ist sehr gut und flüssig zu lesen, aber dennoch von wissenschaftlicher Qualität. Von allgemeinem Interesse sind zum Beispiel die Ausführungen über die Evolution der Insekten zur blutsaugenden Lebensweise, denn dieser Evolutionsschritt hat zweifelsohne mehrfach (mindestens 6 mal) unabhängig voneinander stattgefunden. In einem abschließenden Kapitel, das man auch als eigenständigen Review oder als hervorragende Einleitung lesen kann, werden alle Taxa blutsaugender Insekten systematisch zusammengefaßt und ihre Bedeutung und Biologie wird kurz zusammengestellt. Das vorliegende Werk kann man sowohl Entomologen als auch medizinisch Interessierten uneingeschränkt empfehlen. K. Schönitzer

8. Otte, D. & P. D. Brock: Phasmida Species File. Catalogue of Stick and Leaf Insects of the World. – Insect Diversity Association, Academy of Natural Sciences, Philadelphia, 2005. 414 pp. 210 × 280 mm, ringbound. ISBN 1-929014-08-2.

Since almost two decades the species of the insect order Phasmatodea, the stick insects and walking leaves, find the interest of more and more enthusiasts. Many of them start engaging in taxonomic work, resulting in a considerable number of publications. But only two major publications, 2001 Bragg's "Phasmids of Borneo" and 2004 Zompro's "Revision of the genera of the Areolatae" dealt with the order. A catalogue, urgently required, was still missing. Otte & Brock tried to fill this gap with the present work. Considering the high price a high quality book-production can be expected, but a ringbound collection of loose leaves is delivered. The cover was damaged after a short use already. This way of binding is unsuitable for the claims on the quality of a book which shall be used constantly. The buyer must be recommended to cut and bind the book in a more suitable way.

On p. 2 the book is called a "second edition". This is not really correct, the so called previous edition did not fulfil the requirements of article 8.6 of the International Rules of Zoological Nomenclature. A consequence is that all taxonomic acts must be dated 2005 and not 2003, as suggested in the introduction. The authors stick to the grammatically incorrect term "Phasmida" instead of the correct term "Phasmatodea". Fortunately, the use of "Phasmida" is decreasing, and hopefully it will not be encouraged again by this book again.

A considerable number of errors is corrected on a separate sheet of paper. This includes a link to a website, where further errors and additions shall be published. At the moment this site is offline. Considering the high price a more thoroughly revision of the manuscript would not only been desirable, but urgently necessary, since the value of such a catalogue is more or less solely defined by the correctness of its contents.

One chapter contains collections of references dealing with the biogeographical regions. The way of selection of these references is not obvious, minor generic revisions stand beside an unpublished thesis and species lists of all groups of insects, while several important works are missing. One of the most important works on nearctic phasmids (Zompro 1998: Revision of Diapheromerinae) is not cited for the Nearctic, and another work dealing solely with this fauna (Helfer 1987: How to know the Grasshoppers, Cockroaches and their allies) can only be found in the section "General".

The sections "Type catalogues", "Taxonomic Arrangement" and "List of genera" appear well-done, but the sense of the prominent rendering of self-creating tribal names as, for example, Necrosciini, the single tribe in the subfamily Necrosciinae, is confusing.

In the section "Taxa above the level of genus" almost all more recent important publications are missing, though some of them are mentioned on the separate leaf.

In the main part "Genera and Species" many spelling mistakes like "dulterina" instead of "adulterina" (S. 228) could have been avoided with a careful review. This is also true for formatting, *Athertonia* is placed as a valid genus under "T", instead of "A". At a closer look it becomes obvious that this is a wrongly formatted synonym. The weakest treatment concerns *Heteronemia*. 23 species are listed in this genus, which actually belong to various genera (*Heteronemia*, *Pseudosermyle*, *Baculum*, etc.) and families (*Heteronemiidae*, *Diapheromeridae*, *Phasmatidae*), almost without exception their actual assignment has been published in major revisory works already.

Systematics of Phasmatodea are changing, and the next years will bring a considerable number of changes. Valuable as it is, this work is still premature, and, considering the high price, it cannot really be recommended. This might change when a second, thoroughly corrected edition will (hopefully) be published. O. Zompro

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Revision of the genera *Agonocheila* Chaudoir and *Minuthodes* Andrewes in New Guinea

(Insecta, Coleoptera, Carabidae, Lebiinae)

Martin Baehr

Baehr, M. (2006): Revision of the genera *Agonocheila* Chaudoir and *Minuthodes* Andrewes in New Guinea (Insecta, Coleoptera, Carabidae, Lebiinae). – Spixiana **29/2:** 103-145

As a second part of revisions of lebiine genera from New Guinea, the New Guinean species of the related genera *Agonocheila* Chaudoir and *Minuthodes* Andrewes are revised. For both genera revised diagnoses are provided. For the New Guinean species of *Agonocheila* two new genera *Cheilagona*, gen. nov. and *Pseudoplatia*, gen. nov. are erected. Some New Guinean species formerly included in *Minuthodes* also belong to the latter new genus. *Cheilagona* includes a few Australian species, whereas *Pseudoplatia* apparently is restricted to New Guinea.

The New Guinean *Agonocheila gressitti* Darlington, *A. rufa* Darlington, and *A. variabilis* Darlington and the two Australian species *Agonocheila stictica* Blackburn and *A. ovalis* Sloane are transferred to the new genus *Cheilagona*, whereas *Agonocheila minuthoides* Darlington, *A. duplicata* Darlington, *A. expansa* Darlington, *A. dorsata* Darlington, *Minuthodes rossi* Darlington, *M. sedlacekorum* Darlington, and *M. subnitens* Darlington are moved to *Pseudoplatia*.*Agonocheila duplicata* Darlington, 1968, is synonymized with *Minuthodes sedlacekorum* Darlington, 1968. As the ranges of both named subspecies of *Minuthodes sexualis* Darlington largely overlap and they were described only on behalf of their different elytral pattern that, however, varies considerably within both nominal taxa, *M. sexualis signata* Darlington is synonymized with the nominate subspecies. Based on differences in body size, shape of pronotum, shape of female terminal abdominal sternite, elytral pattern, and shape of aedeagus, *M. sexualis* is divided into three taxa that are described as species which are sympatric in certain areas.

Following taxa are described as new: *Minuthodes atrata*, *M. rectimargo*, *Cheilagona gressitti planata*, *C. nigropicea*, *Pseudoplatia dorsata minor*, *P. drumonti*, *P. latipennis*, *P. missai*, *P. georgei*, *P. recticollis*, *P. riedeli*, and *P. gerdi*. Revised keys to the New Guinean species of the genera *Minuthodes*, *Cheilagona*, and *Pseudoplatia* are provided. A checklist of all species with notes on distribution is added.

Dr. Martin Baehr, Zoologische Staatssammlung, Münchhausenstr. 21, D-81247 München, Germany; e-mail: martin.baehr@zsm.mwn.de

Introduction

As a second part of revisions of lebiine genera from New Guinea (see Baehr 2004) the species of the related genera *Agonocheila* Chaudoir and *Minuthodes* Andrewes in New Guinea are revised. *Agonocheila* and *Minuthodes* are very similar in shape and external structure and thus are easily confused. Even Darlington (1968) in his famous monography about the carabid beetles of New Guinea gave only very weak distinguishing characters that actually are of little use for a definitive distinction. As a consequence, he not only intermixed both genera, but described two extremely similar species (if they are even separate species!) in different genera. The crucial point is that the genus *Agonocheila* in its present sense is not only numerous in Australia but is also very heterogenous in shape and structure, so that it may be divided in future into certain separate genera. Hence, as a first step to clear up the situation, the genus *Minuthodes* is being more strictly defined herein. Then the genus *Agonocheila* is defined more exactly, in particular with respect to the named New Guinean species. Further division of the Australian *Agonocheila*, however, cannot be done unless the many described and undescribed Australian species are thoroughly revised.

Minuthodes Andrewes (former *Platia* Chaudoir) in its present sense as used by Darlington (1968) and Lorenz (1998) includes 20 species and one additional subspecies and is distributed from Sulawesi and the Moluccas through New Guinea to eastern and northern Australia and to Solomon Islands. Darlington's (1968, p. 95) treatment of the New Guinean fauna includes 9 species and one subspecies, of which only *M. papuana* (Sloane) was known prior to Darlington's paper. For the reasons discussed above, however, three species described by Darlington would belong to *Agonocheila* in its former sense (see below) rather than *Minuthodes* when the revised diagnosis (see below) of *Minuthodes* is applied.

Agonocheila is mainly an Australian genus which, according to the most recent catalogue (Moore et al 1987) in Australia includes 31 described species, though *A. froggatti* (Macleay) and *A. minima* (Macleay) in the meantime were removed to *Minuthodes* Andrewes (Baehr 1990). Certainly, in Australia the genus *Agonocheila* is even far more numerous in terms of species, but any attempt to work on this genus or even to identify species apart from very few well known ones, is of little use until the genus has been thoroughly revised by strict comparison with the types. Apart from Australia, the genus in its former sense extends to New Guinea but apparently not further north. From New Guinea, Darlington described 7 species (Darlington 1968, p. 118).

Material supply for Darlington was quite unsatisfactory which most probably was due to very insufficient sampling efforts, in particular in the western half of New Guinea (Irian Jaya, or present Papua). In the meantime western New Guinea was slightly better explored, mainly through the efforts of certain recent collectors, but knowledge still is far from being satisfactory.

During my work of identification of the fine samplings of A. Riedel (Karlsruhe) and a few other collectors, and of the sample captured by the fogging activities of O. Missa of IRSNB (Brüssels) (see Baehr 2004) I decided to revise the related genera *Agonocheila* Chaudoir and *Minuthodes* Andrewes together, because reasonable identifications are impossible without comparison with the types, in spite of Darlington's keys to both genera (Darlington 1968, pp. 96 and 119). While trying to do identifications, I also recognized the difficulties in distinguishing both genera and furtheron, to define genera on the whole. And indeed, the morphological differences are rather weak and so far it was rather a matter of opinion where to draw the borderline between the genera. As a consequence, in the present paper the genera are more restricted and two additional genera are described to gain a less ambiguous classification.

Material and methods

Altogether, about 360 New Guinean specimens were available for this study of which more than 200, however, belong to the well known and easily identified species *M. papuana* (Sloane) and *M. regularis* Darlington. Most other species of *Minuthodes* and almost all of *Agonocheila* s. l. either seem to be much rarer than these, or they were not yet sampled by appropriate methods.

For comparison I examined material and/or types of almost all extra-New Guinean species of *Minuthodes* and of 26 identified (i.e. compared with the types) and additional 30 unidentified Australian species of *Agonocheila* from my own working collection.

Due to the kindness of the curators mentioned under "Acknowledgements" I was able to compare the types of almost all New Guinean and extra-New Guinean species of *Minuthodes* and of all species of New Guinean *Agonocheila*, except for the type of *M. simplex* Darlington which, however, is easily identified from description.

For the taxonomic treatment standard methods were used. The male genitalia were removed from specimens soaked for a night in a jar under wet atmosphere, then cleaned for a short while in hot KOH.

For examination of the generally fine though taxonomically important punctuation and microreticulation of the surface a high quality stereo microscope with up to 64 × magnification was used, supported by a lamp of high intensity giving natural light that could be focussed. For exact definition of the microsculpture such light is preferable, because fibre-glass optics substantially change the impression of the surface structures.

The habitus photographs were obtained by a digital camera using ProgRes Capture Basic and AutoMontage and subsequently were worked with Corel Photo Paint 10.

Measurements were taken using a stereo microscope with an ocular micrometer. Length has been measured from apex of labrum to apex of elytra. Lengths, therefore, may slightly differ from those of other authors. Length of pronotum was measured along midline.

Characters

Although colour pattern seems very significant in the patterned species, elytral pattern and colouration may vary to a considerable degree, or, on the other hand, may be very similar in related species. Thus, pattern is not always the best way to distinguish between species. In many species degree and structure of microsculpture and pilosity of the surface can be well used as differentiating characters. As size also varies to a considerable degree within species, body shape, structure of surface, and structure of the male genitalia generally yield the best character for distinction of species. Shape and structure of aedeagus and genital ring also are useful for distinction of the genera.

Abbreviations of collections

ANIC	Australian National Insect Collection, Canberra
BMH	B. P. Bishop Museum, Honolulu
CAS	California Academy of Science, San Francisco
CBM	Working collection M. Baehr at Zoologische Staatssammlung, München
DEI	Deutsches Entomologisches Institut, Müncheberg
HNMB	Hungarian National Museum of Natural History, Budapest
IRSNB	Institut Royal des Sciences Naturelles, Bruxelles
MCZ	Museum of Comparative Zoology, Cambridge/Mass.
MNHB	Museum für Naturkunde der Humboldt Universität, Berlin
MNHP	Muséum National d'Histoire Naturelle, Paris
NHM	The Natural History Museum, London
QMB	Queensland Museum, Brisbane

Key to the genera of New Guinean lebiine ground beetles, formerly alluded to the genera *Minuthodes* Andrewes and *Agonocheila* Chaudoir

Note. This key applies to all known species of both mentioned genera, i.e. also the extra New Guinean ones, but it should be noted that the Australian "*Agonocheila*" are so heterogenous that in future they probably will be divided further into certain separate genera. To accommodate this situation, the New Guinean species of "*Agonocheila*" have been divided into two new genera that in future should be applied also to the Australian "*Agonocheila*".

Although shape and structure of the male genitalia are quite characteristic for the three New Guinean genera, this key does not make use of genitalic characters, because few Australian "Agonocheila" were dissected so far, which means that no general statements are possible at present about their male genitalia. Even the few species dissected show a number of quite different types of aedeagi bearing denticulate plates or spines, or not, but all being quite different from the aedeagi of the three genera mentioned below.

1. Head very large with large, semicircular eyes **and** pronotum wide or very wide, cordiform with angulate to acute basal angles **and** anterior lateral pronotal seta situated at or in front of apical third **and** elytra wide, markedly depressed, quadrate **and** pilosity of pronotum and elytra short, regular, and usually depressed [except for the glossy black, conspicuously quadrimaculate *M. multisetosa* Baehr that has erect pronotal pilosity] **and** head impilose [except for *M. multisetosa* Baehr that has a sparsely pilose head]. Sulawesi, Moluccas, New Guinea, New Britain, Solomon Islands, Australia .... *Minuthodes* Andrewes

– Not all these characters together present; head and pronotum always with dense and usually rather elongate, commonly erect pilosity; pilosity of elytra dense, usually more elongate and less depressed; anterior lateral pronotal seta usually situated behind apical third, slightly in front of middle (this latter character state applies to all New Guinean species, but not to all Australian "*Agonocheila*"!) .... 2.

2. Whole surface covered with dense and rather elongate, commonly fairly erect pilosity; margin of pronotum and elytra with dense, elongate fringe of setae; upper surface of tibiae plainly pilose; elytral pattern composed of many interrupted elongate light stripes, or remarkably variegate. New Guinea .... *Pseudoplatia*, gen. nov.

– Surface usually covered with less dense, and shorter, usually depressed pilosity; margin of pronotum and elytra without fringe of setae; upper surface of tibiae not plainly pilose; elytral pattern mostly simple, uni- or biplagiate, or with a light sutural stripe, less commonly more variegate, but never with many interrupted elongate light stripes .... 3.

3. Elytra dorsally and laterally remarkably convex, reversely oviform; pronotum narrow, dorsally convex, barely cordiform and with more or less obtuse basal angles, lateral margin barely explanate. New Guinea, northern Australia .... *Cheilagona*, gen. nov.

– Elytra dorsally depressed, laterally less convex, not reversely oviform; pronotum wide, dorsally more or less depressed, cordiform and with angulate or acute basal angles, lateral margin usually widely explanate. Australia.................. ....*Agonocheila* Chaudoir

Genus *Minuthodes* Andrewes

Andrewes, 1941: 317; Darlington 1968: 95; Moore et al. 1987: 293; Baehr 1990: 34; Lorenz 1998: 334.
Platia Chaudoir, 1869: 155 (non *Platia* Hübner, 1820); Sloane 1917: 433; Cziki 1932: 1361.

Type species: *Platia lineella* Chaudoir, 1869 (fixed by Andrewes 1939: 137).

Diagnosis. Genus of Lebiinae, closely related to the genera *Agonocheila* Chaudoir, *Pseudoplatia* gen. nov., and *Cheilagona*, gen. nov., but recognized and distinguished from these by the large head that usually is little narrower than the pronotum; large, semicircular eyes; wide to very wide and short, usually rather cordiform pronotum that has the anterior marginal setae at or in front of anterior third; short and wide, depressed, rather quadrate elytra bearing two or three more or less well discernible setiferous punctures on 3rd interval but sometimes additional ones on 5th and 7th intervals; absence of any pilosity, or presence of short, regular, depressed pilosity on pronotum and elytra which usually is very sparse on pronotum; not plainly pubescent upper surfaces of meso- and metatibiae; and small aedeagus devoid of any markedly sclerotized plates or rods, but with a small, triangular, finely denticulate plate in orificium.

The genus combines medium sized to small, always markedly depressed species with wide to very wide pronotum, short and wide elytra, impilose, highly glossy to more or less extensively pilose surface. It includes uniformly black or bluish species and species with different elytra patterns that vary from simply bi- or quadrimaculate to a pattern of many complete or much interrupted longitudinal lines, and even to a higly variegated pattern of lines and spots.

Distribution. Sulawesi, Moluccas, New Guinea, Solomon Islands, northern and eastern Australia.

Note. I have examined all types of the genus *Minuthodes* except for *M. simplex* Darlington which was not available though is easily recognized through the combination of uniformly black colour, plain dorsal pubescence, and unarmed elytra.

Key to the Papuan species of the genus *Minuthodes* Andrewes

Note. As some of Darlington's species originally described in *Minuthodes* are herein removed to the new genus *Pseudoplatia*, a reviewed key for the New Guinean *Minuthodes* is given which should replace both Darlington's key (Darlington 1968, p. 96) and Baehr's partial key (Baehr 1998, p. 240). For the benefit of the user, the single species known to occur on Solomon Islands is included that had been overlooked by Darlington (1968). A key to the Australian species is available in Baehr (1994, p. 37) to which only *M. trimaculata* Baehr (Baehr 2001) should be added.

1. Elytra marked with numerous longitudinal yellow lines (Fig. 32). Whole New Guinea, New Britain...*papuana* (Sloane)
– Elytra differently patterned or unicolourous.... .... 2.

2. Elytra uniformly metallic blue-black (Fig. 35). Eastern Papua New Guinea................................ ....*metallica* Darlington
– Elytra either with reddish or yellow spots, or when unicolourous not metallic blue-black... 3.

3. Elytra not plainly pubescent; shining black, immaculate or bimaculate or quadrimaculate, but if maculate at least one pair of spots elongate; females with a subapical tooth or ridge on metafemur (Fig. 4)...4.
– Elytra plainly pubescent; when maculate, spots not elongate; females without a subapical tooth or ridge on metafemur .... 6.

4. Size larger, body length usually > 5 mm; females with a deep, square excision at apex of terminal abdominal sternite (Fig. 5); pronotum with apical angles distinctly produced; elytra always spotted; subhumeral spot, when present, large and more circular (Figs 38, 39); aedeagus rather large **and** with short apex (Fig. 1). Whole New Guinea.................................. *sexualis* Darlington
– Size smaller, body length usually < 5 mm; females without a square excision at apex of terminal abdominal sternite, at most with slight concavity (Fig. 6); pronotum with apical angles barely produced; elytra spottet or not; subhumeral spot, when present, elongate (Figs 40, 41); aedeagus either large but then with longer apex, or short and compact and with very short apex (Figs 2, 3)... 5.

5. Elytra always uniformly black (Fig. 42); size smaller, length <4.5 mm; aedeagus short and compact and with very short apex (Fig. 3). Papua Peninsula, easternmost New Guinea .... *atrata*, spec. nov.
– Elytra usually spotted, rarely uniformly black (Figs 40, 41); size usually larger, length >4.5 mm; aedeagus longer and narrower and with longer apex (Fig. 2). Most of New Guinea, though not yet recorded from Papua Peninsula .... *rectimargo*, spec. nov.
6. Elytra uniformly black, unspotted....................7.
– Elytra bimaculate or quadrimaculate.............. 8.
7. Elytra at apex with an elongate spine opposite 1st stria (Figs 43, 44). Solomon Islands ....*nigra* (Emden)
– Elytra at apex without spine. Goodenough Island east of New Guinea.............. *simplex* Darlington
8. Elytra bimaculate at humerus (Fig. 36); apex of elytra rather deeply emarginate. Western Irian Jaya ....*biplagiata* Baehr
– Elytra quadrimaculate; apex of elytra less deeply emarginate .... 9.
9. Pronotum with several anterior lateral setae; elytra with rows of elongate setae on 3rd, 5th, and 7th intervals (Fig. 37); head and pronotum with rather erect pilosity. Western Irian Jaya ....*multisetosa* Baehr
– Pronotum with a single anterior lateral seta; elytra with three short setae on 3rd interval only; head impilose, pronotum with sparse, depressed pilosity... 10.
10. Commonly smaller species (length 4.0-5.5 mm); elytral spots about circular in outline (Fig. 33); lateral margins of pronotum with indistinct prebasal sinuosity. Whole New Guinea ....*regularis* Darlington
– Generally larger species (length 5.5-5.8 mm); elytral spots irregular in outline (Fig. 34); lateral margins of pronotum with distinct prebasal sinuosity. Only known from near Jayapura (=Hollandia), north-eastern Irian Jaya ....*irregularis* Darlington

Apart from the *M. sexualis*-complex, no new species were detected in the available material, though I have seen large series of *M. papuana* (Sloane) and of *M. regularis* Darlington, collected by O. Missa during his canopy fogging program carried out in 1993 and 1994 at Baiteta, Madang Province, Papua New Guinea. All other species apart from those of the sexualis-complex seem to be extremely rare and no additional specimens have been recorded of *M. irregularis* Darlington, *M. metallica* Darlington, *M. multisetosa* Baehr, *M. nigra* Van Emden, and *M. simplex* Darlington, and only one specimen of *M. biplagiata* Baehr (see below), since their description. The taxonomic status of the very polymorphic *"M. sexualis"* Darlington is discussed below.

Minuthodes biplagiata Baehr, 1998

Fig. 36

Minuthodes biplagiata Baehr, 1998: 236.

New record. 1♀, Irian Jaya, Nabire 70 km W, Yamorlake, Gariau, 134°56'E. 03°43'S, 1.III.1998, leg. A. Weigel (CBM).

Note. This species is recorded only from two localities in western Irian Jaya.

Minuthodes sexualis-complex

Darlington (1968) described two subspecies of *M. sexualis* mainly based on the presence, or absence of the anterior elytral spot, and he stated that the nominate form (unspotted or bimaculate with a single pale stripe in apical half of each elytron) only occurs in Papua New Guinea, exclusively in the Papua Peninsula, whereas the subspecies *signata* Darlington (bimaculate or quadrimaculate, but when bimaculate with a single pale stripe in basal half of each elytron) was described from Huon Peninsula, but was said to range through almost the whole of New Guinea. Darlington also stated that females of both subspecies generally bear a conspicuous, square excision at the terminal abdominal sternum, though he reported a single exception form this rule.

Apart from these differences of elytral pattern, I was unable to find any other differences in those females available to me that bear the mentioned square excision, although they include bimaculate and quadrimaculate specimens. Because I have both, specimens of the bimaculate *sexualis* s. str. form and those of the quadrimaculate *signata* form from the western part of New Guinea, furtheron, because elytral pattern seems to be variable anyway in this complex, and finally, because I was unable to find any other morphological differences between the mentioned specimens, I am sure that the differentiation of Darlington's subspecies is unjustified and therefore, I herewith state that the subspecies *signata* Darlington is synonymous with the nominate subspecies.

However, a number of examined females (unspotted, bimaculate, and quadrimaculate ones) lack the square excision of the terminal abdominal sternum, although they possess the subapical tooth at the metafemur stated to be characteristic for *M. sexualis* (Fig. 4). They also differ from normal *M. sexualis* in certain additional characters, e.g. generally minor size, wider pronotum with wider base and barely produced apical angles, elongate, instead of more circular subbasal elytral spot. Also dissection of a couple of males from different localities and bearing different elytral patterns, or no pattern at all, revealed three types of aedeagi, that differ in certain characters even when being quite similar in their general structure. Therefore, three populations can be recognized that differ in body size, shape of pronotum, elytral pattern, shape of female terminal abdominal sternite, and structure of male genitalia. Because their ranges widely overlap and specimens of two populations apparently are sympatric in certain areas, they are herein described as separate species. Although elytral pattern varies significantly in geographically restricted populations in the maculate species, I refrained from describing additonal infraspecific taxa which can be done only on the basis of additional and more evenly distributed material.

Minuthodes sexualis Darlington, 1968
Figs 1, 4, 5, 23, 38, 39

Minuthodes sexualis sexualis Darlington, 1968: 98; Lorenz 1998: 434.

Minuthodes sexualis signata Darlington, 1968: 98; Lorenz 1998: 434 **(syn. nov.)**.

Examined types. Of *sexualis sexualis*: Holotype: ♀, Dobodura, Papua N.G. Mar-July, 1944 Darlington / *laticeps* Chd. as det. Andr. det Darlington at B.M. 1947-48, Notes p. 36 / M.C.Z. Holotype 31404 / Holotype *Minuthodes sexualis* D. (MCZ). – Paratypes: 1♂, 1♀, Oro Bay, Papua N.G. Dec'43-Jan'44 Darlington / M.C.Z. Paratype 31404 / Paratype *Minuthodes sexualis* Darl. (MCZ).

Of *sexualis signata*: Holotype: ♀, Sambeang, 400M. IV-21-55 / Mongi Watershed, Huon Pen. N. GUINEA, E. O. Wilson / M.C.Z. Holotype 31405 / Holotype *Minuthodes signata* D. (MCZ). – Paratypes: 1♂, 2♀♀, same data / M.C.Z. Paratype 31405 / Paratype *Minuthodes sexualis signata* Darl. (MCZ); 1♀, Butala, Mongi R. IV-22.55 / Mongi Watershed, Huon Pen. N. GUINEA, E. O. Wilson / M.C.Z. Paratype 31405 / Paratype *Minuthodes sexualis signata* Darl. (MCZ); 2♀♀, lower Busu R. Huon Pen. N.G. IV-22.55#, V-12-55# EO Wilson lowl. rainforest / M.C.Z. Paratype 31405 / Paratype *Minuthodes sexualis signata* Darl. (MCZ); 1♂, 4♀♀, N. GUINEA Birò 1898 / Simbang, Huon Golf / M.C.Z. Paratype 31405 / Paratype *Minuthodes sexualis signata* Darl. (MCZ).

Diagnosis. Usually larger, mostly bimaculate, rarely unimaculate species bearing a deep, quadrate excision at apical rim of female terminal abdominal sternum; further distinguished from both, *M. rectimargo*, spec. nov. and *M. atrata*, spec. nov. by slightly narrower pronotum bearing more advanced anterior angles. Males also distinguished from those of *M. rectimargo* by aedeagus bearing a shorter apex, and from *M. atrata* by longer and narrower aedeagus bearing a slightly longer apex.

Supplementary description

Measurements. Length: (4.5)4.8-6.0 mm; width: (2.1)2.3-2.7 mm. Ratios. Width/length of prothorax: 1.92-1.98(2.08) ; width base/apex of prothorax: 0.93-1.0; length/width of elytra: 1.23-1.29; width of elytra/width of prothorax: 1.32-1.40.

Colour (Figs 38, 39). Shining black, elytra always spotted, usually quadrimaculate, but populations from Oro Bay area in Papua New Guinea and from Fakfak Province in western Irian Jaya bimaculate with only the elongate posterior spot present. Anterior spot usually reddish, rather short, gently triangular and posteriorly slightly excised, posterior spot more yellow and elongate, comma-shaped, not or barely extended to adjacent intervals. 2nd-4th antennomeres in parts reddish, basal and apical antennomeres dark.

Male genitalia (Fig. 1). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular, with narrow symmetric apex and short basis. Aedeagus fairly elongate, lower surface evenly concave, apex short, obtuse. Orificium moderately large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts but with a triangular, finely denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia (Figs 5, 23). Terminal abdominal sternite with deep, quadrate excision. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 short, slightly curved, with rather short apex; with two very elongate ventro-lateral ensiform setae, one elongate dorso-median ensiform seta, and a groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. This species varies in elytral pattern and also somewhat in size. Although most populations cover rather large specimens, here and there extraordinarily small ones are found, as for example the one from Maffin Bay. Elytral pattern varies from quadrimaculate with differently shaped anterior spot to bimaculate with the anterior spot lacking. The pronotum usually is narrower than in both related species, but one specimen from Timika has an ex-

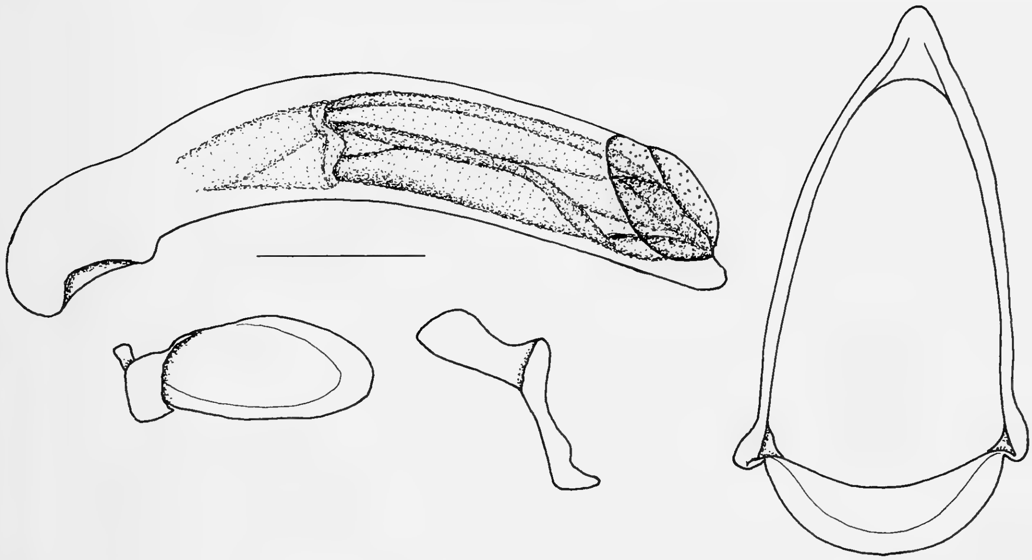


Fig. 1. *Minuthodes sexualis* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

traordinarily wide and short one when measured along midline, because in that specimen the apical margin is exceptionally deeply sinuate.

Distribution. The whole of New Guinea.

New records. Maffin Bay, Dutch N. Guinea, IX-44 E. S. Ross Coll. / *Minuthodes sexualis signata* Darl. (CAS); W-Neuguinea, Cyclops Mts., 4 km nördl. Sentani, 600 m, 8.-13.9.1990/IR7, leg. Balke & Hendrich (CAS); Irian Jaya, Manokwari, Ransiki, Mayuby, Benyas, 300 m, 28.9.1990, leg. A. Riedel (CBM); Irian Jaya, Manokwari, Ransiki, Mayuby, 26.-30.10.1990, leg. A. Riedel (CBM); Irian Jaya, Manokwari, Gn. Meja, 200 m, 21.-24.8.1991, leg. A. Riedel (CBM); Irian Jaya, Fakfak-Pr. 20 km w. Timika, 30 m, 8.-11.1.1996, leg. A. Riedel (CBM); West Papua, Nabire nach Mapia km 117, Unipo, 24.7.1996, leg. Schüle/Stüben (CBM).

Collecting circumstances. Specimens collected by A. Riedel usually were sampled by sieving litter on and under logs in rain forest at low altitudes.

Relationships. With respect to shape of female terminal abdominal sternite, this species probably represents the adelphotaxon of both, *M. rectimargo*, spec. nov. and *M. atrata*, spec. nov.

Minuthodes rectimargo, spec. nov.

Figs 2, 6, 24, 40, 41

Examined types. Holotype: ♂, Irian Jaya, Vogelkop, Testega, 1100-1300 m, 30.3.-12.4.1993, leg. A. Riedel (CBM). – Paratypes: 3♀♀, sama data (CBM, MCZ); 1♂, Irian Jaya, Vogelkop, Testega, 1100-1200 m, 11.4. 1993, leg. A. Riedel (CBM); 1♀, Irian Jaya, Vogelkop, Meydougda, 1200-1400 m, 5.4.1993, leg. A. Riedel (CBM); 2♂♂, Irian Jaya, Manokwari-Pr., Membey, 800-1200 m, 31.8.1991, leg. A. Riedel (CBM); 1♀, Irian Jaya, Manokwari-Pr., Mokwam, Kwau, 1300-1650 m, 17.4.1993, leg. A. Riedel (CBM); 1♂, 4♀♀, Irian Jaya, Panai-Pr., Nabire, Pusppensaat km 54, 500-700 m, 13.-16.8.1991, leg. A. Riedel (CBM, QMB); 2♂♂, Papua NG, Morobe-Pr., Aseki, 1000-1300 m, 13.10.1992, leg. A. Riedel (CBM).

Diagnosis. Medium sized, usually quadrimaculate species devoid of a deep excision at apical rim of female terminal abdominal sternum; further distinguished from *M. sexualis* Darlington by slightly wider pronotum bearing less advanced anterior angles, always longer basal elytral spot but shorter and apically wider posterior spot, and by aedeagus bearing a longer apex; from *M. atrata*, spec. nov. by slightly larger size and longer aedeagus bearing a much longer apex.

Description

Measurements. Length: 4.5-5.0 mm; width: 2.1-2.3 mm. Ratios. Width/length of prothorax: 1.99-2.07; width base/apex of prothorax: 1.02-1.07; length/width of elytra: 1.24-1.32; width of elytra/width of prothorax: 1.38-1.43.

Colour (Figs 40, 41). Shining black, elytra usually spotted, very rarely immaculate, in western part of New Guinea usually quadrimaculate, but a population from Aseki in Papua New Guinea bimaculate with only the remarkably elongate anterior spot present. Anterior spot usually reddish, in

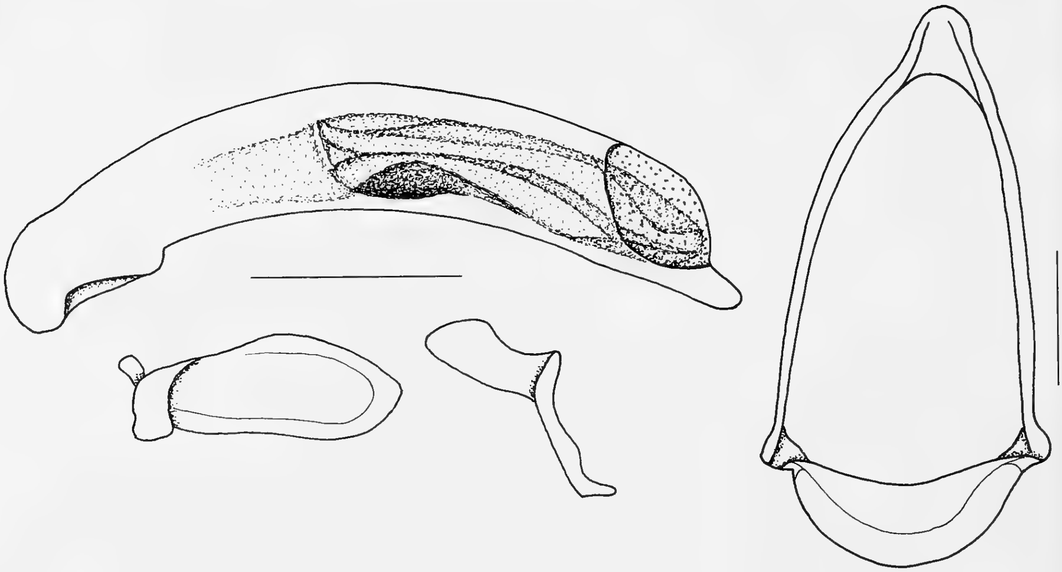


Fig. 2. *Minuthodes rectimargo*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

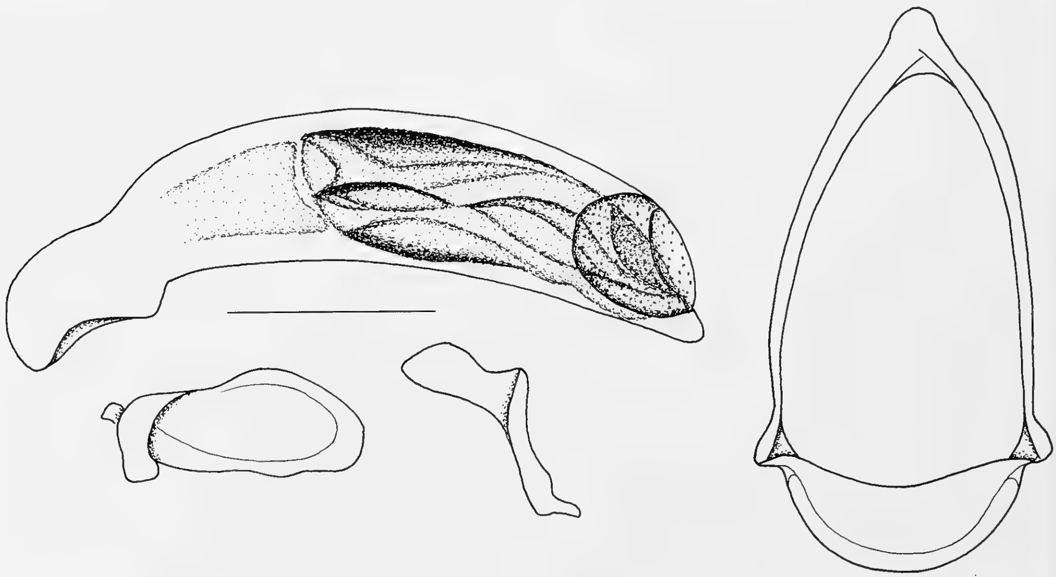


Fig. 3. *Minuthodes atrata*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

quadrimaculate specimens fairly to markedly elongate, gently triangular but posteriorly usually not excised, posterior spot when present more yellow, shorter than in *M. sexualis* and apically more or less extended to adjacent intervals. 2^{nd}-4^{th} antennomeres in parts reddish, basal and apical antennomeres dark.

Head. Very similar to that of *M. sexualis*. Frons sparsely punctate and with some longitudinal sulci near eye. Eyes large, markedly protruding, though head distinctly narrower than prothorax. Antenna short, barely attaining basal angle of pronotum, median antennomeres but slightly longer than wide, densely pilose from apex of 4^{th} antennomere, basal antennomeres sparsely setose. Microreticulation absent from frons and clypeus, present and isodia-

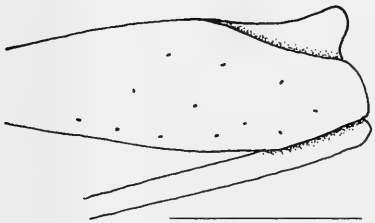
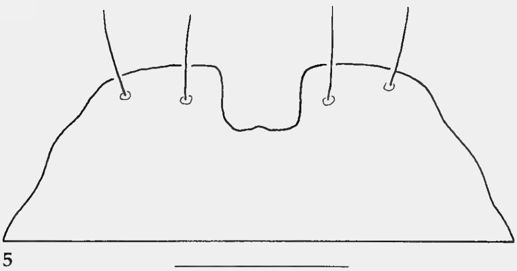


Fig. 4. *Minuthodes sexualis* Darlington. Apex of left female metafemur. Scale: 0.5 mm.



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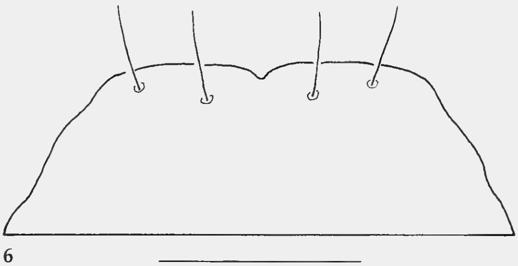

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Figs 5, 6. Female terminal abdominal sternite. **5.** *M. sexualis* Darlington. **6.** *M. rectimargo*, spec. nov. Scales: 0.5 mm.

metric on labrum. Surface highly glossy, impilose.

Pronotum. Very wide, somewhat heart-shaped. Base slightly wider than apex, apical angles rounded off, little produced. Sides almost evenly rounded, widest in anterior third, at anterior lateral seta. At this position margins with a very obtuse angle. Near basal angle with a short but distinct sinuosity. Basal angles rectangular, laterally even faintly projecting. Base laterally straight, in middle gently pedunculate. Base bordered throughout, apex in middle unbordered. Disk in middle somewhat raised. Median line distinct, in middle deeply impressed. Basal grooves fairly deep, oblique, prebasal transverse sulcus distinct. In middle between median line and lateral margin with a large, oblong, moderately deep groove. Anterior marginal seta situated slightly in front of anterior third, at widest diameter of pronotum, posterior marginal seta situated at basal angle. Microreticulation absent, punctuation irregular, fine and sparse on disk, slightly denser laterally and apically. Surface glossy, impilose.

Elytra. Short and wide, widest behind middle, depressed. Humeri evenly rounded, sides gently convex, apex oblique, moderately sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel slightly widened at anterior third. Striae well developed, punctate, intervals slightly convex. Microreticulation absent, intervals with one irregular row of coarse punctures, extremely sparsely pilose, pilosity declined. Three discal pores situated at position of 3rd stria, though pores difficult to detect within the coarse punctuation. Marginal setae very elongate. Lateral margin not serrate, impilose. Surface highly glossy. Posterior wings fully developed.

Lower surface. Very sparsely punctate and shortly pilose. Metepisternum c. twice as long as wide at apex. Terminal abdominal sternum quadrisetose in both sexes.

Legs (see fig. 4). Three basal tarsomeres of male protarsus slightly widened and asymetrically pilose. Female metafemur with a tooth or elongate ridge on upper surface that ends slightly in front of apex.

Male genitalia (Fig. 2). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular, with narrow symmetric apex and short basis. Aedeagus fairly elongate, lower surface evenly concave, apex short, but longer than in related species, obtuse. Orificium moderately large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts but with a triangular, finely denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia (Figs 6, 24). Terminal abdominal sternite only with a short, inconspicuous incision. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 short, slightly curved, with rather short apex; with two elongate ventro-lateral ensiform setae, one elongate dorso-median ensiform seta, and a groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Rather little variation noted in size and proportions. Elytral colour pattern, however varies from uniformly black to bimaculate and quadrimaculate which is most common. Usually the anterior spot is somewhat elongate but oval-shaped, but in the two bimaculate specimens from PNG this spot is very elongate and covers almost the whole anterior half of the elytra. These specimens may well represent a separate taxon, but for any decision additional specimens, in particular males, are required.

Distribution. Central and western Irian Jaya, a single record from eastern central Papua New Guinea, which population actually may represent another taxon (see under variation).

Collecting circumstances. All specimens sieved from litter on logs in rain forest at medium altitude.

Etymology. The name refers to the absence of a deep incision at the female terminal abdominal sternite.

Relationships. With respect to shape of female terminal abdominal sternite more closely related to *M. atrata*, spec. nov. than to *M. sexualis* Darlington and perhaps the adelphotaxon of the former.

Minuthodes atrata, spec. nov.

Figs 3, 25, 42

Examined types. Holotype: ♂, Oro Bay, Papua N.G. Dec'43-Jan'44 Darlington / M.C.Z. Paratype 31404 / Paratype *Minuthodes sexualis* Darl. (MCZ). – Paratypes: 4♂♂, same data / M.C.Z. Paratype 31404 / Paratype *Minuthodes sexualis* Darl. (MCZ, CBM); 1♀, Dobodura, Papua N.G. Mar-July, 1944 Darlington / M.C.Z. Paratype 31404 / Paratype *Minuthodes sexualis* Darl. (MCZ); 1♂, NEW GUINEA: PAPUA; Kokoda-Pitoki, 450 m, III-24-1956 / J. L. Gressitt Collector / M.C.Z. Paratype 31404 / Paratype *Minuthodes sexualis* Darl. (MCZ).

Diagnosis. Small, uniformly black species devoid of a deep excision at apical rim of female terminal abdominal sternum; further distinguished from *M. sexualis* Darlington by slightly wider pronotum bearing less advanced anterior angles, and by shorter and more compact aedeagus; from *M. rectimargo*, spec. nov. by slightly lesser size and by smaller aedeagus bearing a much shorter apex.

Description

Measurements. Length: 4.1-4.5 mm; width: 1.85-2.10 mm. Ratios. Width/length of prothorax: 1.99-2.03; width base/apex of prothorax: 1.01-1.07; length/width of elytra: 1.26-1.31; width of elytra/width of prothorax: 1.38-1.42.

Colour (Fig. 42). Unicolourous black. 2^{nd}-4^{th} antennomeres in parts reddish, basal and apical antennomeres dark.

Head. Very similar to that of *M. sexualis*. Frons sparsely punctate and with some longitudinal sulci near eye. Eyes large, markedly protruding, though head distinctly narrower than prothorax. Antenna short, barely attaining basal angle of pronotum, median antennomeres but slightly longer than wide, densely pilose from apex of 4^{th} antennomere, basal antennomeres sparsely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Surface highly glossy, impilose.

Pronotum. Very wide, somewhat heart-shaped. Base slightly wider than apex, apical angles rounded off, little produced. Sides almost evenly rounded, widest in anterior third, at anterior lateral seta. At this position margins with a very obtuse angle. Near basal angle with a short but distinct sinuosity. Basal angles rectangular, laterally even faintly projecting. Base laterally straight, in middle gently pedunculate. Base bordered throughout, apex in middle unbordered. Disk in middle somewhat raised. Median line distinct, in middle deeply impressed. Basal grooves fairly deep, oblique, prebasal transverse sulcus distinct. In middle between median line and lateral margin with a large, oblong, moderately deep groove. Anterior marginal seta situated slightly in front of anterior third, at widest diameter of pronotum, posterior marginal seta situated at basal angle. Microreticulation absent, punctuation irregular, fine and sparse on disk, slightly denser laterally and apically. Surface glossy, impilose.

Elytra. Short and wide, widest behind middle, depressed. Humeri evenly rounded, sides gently convex, apex oblique, moderately sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel slightly widened at anterior third. Striae well developed, punctate, intervals slightly convex. Microreticulation absent, intervals with one irregular row of coarse punctures, extremely sparsely pilose, pilosity declined. Three discal pores situated at position of 3^{rd} stria, though pores difficult to detect within the coarse punctuation. Marginal setae very elongate. Lateral margin not serrate, impilose. Surface highly glossy. Posterior wings fully developed.

Lower surface. Very sparsely punctate and shortly pilose. Metepisternum c. twice as long as wide at apex. Terminal abdominal sternum quadrisetose in both sexes.

Legs (see fig. 4). Three basal tarsomeres of male protarsus slightly widened and asymetrically pilose. Female metafemur with a tooth or elongate ridge on upper surface that ends slightly in front of apex.

Male genitalia (Fig. 3). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular, with narrow symmetric apex and short basis. Aedeagus short and compact, lower surface evenly concave, apex very short, obtuse. Orificium moderately large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts but with a triangular, finely denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia (Fig. 25). Terminal abdominal sternite only with a short, inconspicuous incision. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with rather moderately elongate apex; with two moderately elongate ventro-lateral ensiform setae, one elongate dorso-median ensiform seta, and a groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Little variation noted.

Distribution. So far only recorded from a restricted area in north-eastern Papua Peninsula between Oro Bay and Kokoda.

Collecting circumstances. Not recorded, probably a lowland form.

Etymology. The name refers to the uniformly dark colouration.

Relationships. See under *M. rectimargo*, spec. nov.

Genus *Cheilagona*, gen. nov.

Diagnosis. Genus of Lebiinae, characterized by the following character states: rather convex body; comparatively narrow, convex, and narrow and not cordiform pronotum; convex, ovate elytra; presence of rather elongate, quite erect pilosity on head and pronotum, and of short and depressed pilosity on elytra; absence of a fringe of elongate setae on the margins of pronotum and elytra; impilose upper surface of tibia; quadrisetose male and female terminal abdominal sternites; absence of a notch near apex of middle tibia in males; denticulate tarsi; widened and squamose 1st-3rd protarsomeres in males; absence of elytral pattern or presence of a circular or rather x-shaped, more or less dismembered, common light spot; large male genitalia; remarkably asymmetric genital ring; large, elongate adeagus commonly with upturned, hook-shaped apex and with denticulate, strongly sclerotized parts within the internal sac; very small female stylomeres bearing two stout ventro-lateral and one elongate dorso-median ensiform setae but no nematiform seta.

Type species. *Agonochila gressitti* Darlington, 1968, by present designation.

Distribution. New Guinea, north-eastern Australia.

Relationships. This genus occupies a rather isolated position within the *Agonocheila*-complex. According to present knowledge of the male genitalia of *Agonocheila* s. str., *Cheilagona* is not too closely related to the latter.

Etymology. The name is an anagram of *Agonocheila*.

Key to the New Guinean species of the genus *Cheilagona*, gen. nov.

Note. This key includes only those species that are known to occur in New Guinea. A few species occur in Australia, e.g. *Agonocheila ovalis* Sloane, *A. stictica* Blackburn, and perhaps additional described and undescribed ones.

1. Elytra without any definite colour pattern .....2.
– Elytra with distinct light colour pattern .... 3.

2. Whole body uniformly reddish (Fig. 48); elytra longer, ratio l/w > 1.35; intervals more depressed, punctuation coarser and denser, intervals between punctures clearly smaller than diameter of punctures, no microreticulation visible between punctures, therefore elytra glossier; aedeagus very large, with hook-shaped apex, internal sac with one elongate and one short, markedly denticulate sclerotized plate (Fig. 9). Eastern Papua New Guinea.... *rufa* (Darlington)
– Colour darker, at least elytra dark piceous, head and pronotum slightly lighter (Fig. 49); elytra shorter, ratio l/w < 1.32; intervals more convex, punctuation less coarse and less dense, intervals between punctures about as large as diameter of punctures, traces of microreticulation visble between punctures, therefore elytra less glossy; aedeagus unknown. Central western Irian Jaya .... *nigropicea*, spec. nov.

3. Elytra with a large spot of variable size and shape in or behind middle that may be rather circular or even somewhat horseshoe-shaped, but has always quite regular margins (Figs 45, 46); aedeagus with hook-shaped apex, internal sac with two elongate, denticulate, sclerotized plates (Fig. 7), or unknown ....4.
– Elytra with a large, very variegated, x-shaped spot in middle that can be more or less dissected into single spots or into two remarkably serrate transverse bands, but margins always very irregular (Fig. 47); aedeagus not with hook-shaped apex, internal sac with one narrow sclerotized rod at bottom, a short spine in middle and a short, strongly denticulate plate at roof (Fig. 8). Whole New Guinea......... *variabilis* (Darlington)

4. Striation of elytra distinct, intervals distinctly convex; punctuation coarser (Fig. 45); range montane, collected so far above 550 m; aedeagus with hook-shaped apex, internal sac with two elongate, denticulate, sclerotized plates and a short one between these at bottom (Fig. 7). Whole New Guinea .... *gressitti gressitti* (Darlington)

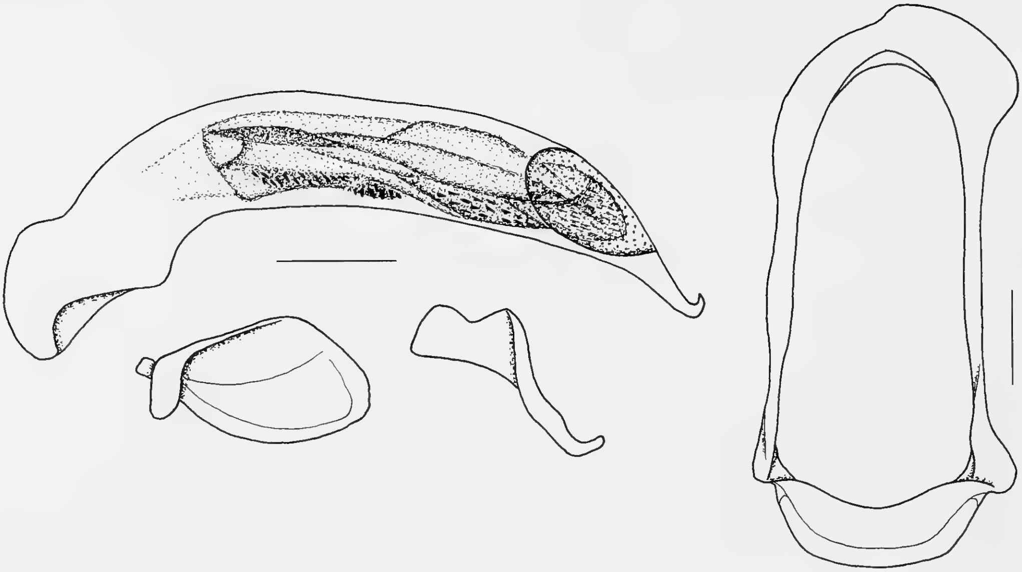


Fig. 7. *Cheilagona gressitti gressitti* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

– Striation of elytra not perceptible, intervals absolutely depressed; punctuation finer (Fig. 46); range planar, collected so far below 200 m; aedeagus unknown. Eastern central Irian Jaya .... *gressitti planata*, subspec. nov.

Cheilagona gressitti (Darlington) (comb. nov.)

This species apparently occurs in two subspecies that are distinguished by the surface structure of their elytra. Apparently the nominate subspecies is montane, whereas the single available specimen of the new subspecies has been captured in lowland.

Relationships. With respect to shape of aedeagus, more closely related to *C. rufa* (Darlington) than to *C. variabilis* (Darlington).

Cheilagona gressitti gressitti (Darlington)
Figs 7, 45

Agonochila gressitti Darlington, 1968: 120; Lorenz 1998: 434.

Examined types. Holotype: ♂, NEW GUINEA. NE. Swart Val: Karubaka 1500 m, XI-20-1958 / J. L. Gressitt Collector / Holotype *Agonochila vulnerata* Darl. / *Agonocheila gressitti* Darlington HOLOTYPE (BMH). / Paratypes: 1♂, 1♀, same data (BMH).

Diagnosis. Distinguished from *C. gressitti planata*, subspec. nov. by distinct striation of elytra and convex intervals; and from the single patterned species *C. variabilis* (Darlington) by circular to reniform, but never variegate elytral spot.

Supplementary description

Measurements. Length: 4.1-4.7 mm; width: 2.05-2.40 mm. Ratios. Width/length of prothorax: 1.54-1.63; width base/apex of prothorax: 1.36-1.42; length/width of elytra: 1.30-1.34; width of elytra/width of prothorax: 1.61-1.69.

Colour (Fig. 45). Upper and lower surfaces piceous to almost black, prothorax in some specimens slightly lighter than elytra. Elytra with light reddish discal spot of different size that may be even reduced to a reniform spot in apical half, though it is never variegate. Margins of elytra reddish, clypeus reddish, labrum, mouth parts, antennae, and legs yellow.

Male genitalia (Fig. 7). Rather large in comparison to body size. Genital ring large, stout, rather parallel, with wide, markedly asymmetric apex and short basis. Aedeagus elongate, lower surface gently concave, apex fairly elongate, markedly upturned and spoon-shaped. Orificium moderately large, almost completely situated on left side. Internal sac with two elongate, coarsely denticulate, sclerotized plates and a short one between them at bottom. Orificium with a triangular, finely denticulate plate. Both parameres short and compact, left one much larger than right one.

Female genitalia. Stylomeres similar to those of *C. variabilis* Darlington.

Variation. Little variation noted, except for the elytral spot that may be reduced to a reniform spot in apical half.

Distribution. Whole New Guinea.

Collecting circumstances. Most specimens probably captured by sieving moss and litter from logs in upland rain forest.

New records. Irian Jaya, Panai-Prov. Epomani, km 145, 550-750 m, 15.-16.1.1996, leg. A. Riedel (CBM); Irian Jaya, Jayawijaya-Pr., Wamena, Angguruk-Tangeam, 1500-1800 m, 28.-29.9.1991, leg. A. Riedel (CBM); Irian Jaya, Jayawijaya-Pr., Angguruk, 1200-1500 m, 23.9.1992, leg. A. Riedel (CBM); Irian Jaya, Jayawijaya-Pr., Emdoman, 800-1200 m, 14.-15.9.1992, leg. A. Riedel (CBM); Irian Jaya, Vogelkop, Meydougda, 1200-1400 m, 5.4.1993, leg. A. Riedel (CBM).

Cheilagona gressitti planata, subspec. nov.

Fig. 46

Examined types. Holotype: ♀, Irian Jaya, Jayawijaya-Pr., Samboca, Upper Kolff R. , 200 m, 10.-14.X.1996, leg. A. Riedel (CBM).

Diagnosis. Distinguished from nominate subspecies by absence of any striation on elytra and absolutely depressed intervals; and from the single patterned species *C. variabilis* (Darlington) by circular, not variegate elytral spot.

Description

Measurements. Length: 4.1 mm; width: 2.05 mm. Ratios. Width/length of prothorax: 1.58; width base/apex of prothorax: 1.38; length/width of elytra: 1.31; width of elytra/width of prothorax: 1.67.

Colour (Fig. 46). Upper and lower surfaces piceous. Elytra with large, yellow, not variegate discal spot. Margins of elytra and pronotum reddish, clypeus reddish, labrum, mouth parts, antennae, and legs yellow.

Head. As in nominate subspecies.

Pronotum. As in nominate subspecies.

Elytra. Shape as in nominate subspecies, but virtually no traces of striae visible, intervals absolutely depressed; punctuation less coarse and less distinct.

Lower surface. As in nominate subspecies.

Legs. As in nominate subspecies.

Male genitalia. Unknown.

Female genitalia. As in nominate subspecies.

Variation. Unknown.

Distribution. Central Irian Jaya, so far collected in lowland. Known only from type locality.

Collecting circumstances. Holotype probably captured by sieving moss and litter from logs in lowland rain forest.

Etymology. The name refers to the occurrence of this subspecies in lowland, in contrast to the nominate subspecies.

Cheilagona variabilis (Darlington) (comb. nov.)

Figs 8, 26, 47

Agonochila variabilis Darlington, 1968: 120; Lorenz 1998: 434.

Examined types. Holotype: ♂, NEW GUINEA (NETH.) WISSELMEEREN: 1530 M. URUPURA, KAMO V. AUG. 11, 1955 / J. L. Gressitt Collector / Holotype *Agonochila variabilis* Darl. (BMH). – Paratypes: 2♀♀, NEW GUINEA: (NW) Wisselmeeren, Enarotadi, 1850 m. 2.-3.VIII.1962, and 1800m, 24.VIII.1962 / J. Sedlacek Collector (BMH).

Diagnosis. Distinguished from both subspecies of the single patterned species *C. gressitti* (Darlington) by somewhat cruciform, highly variegate elytral spot that always bears some dark spots within.

Supplementary description

Measurements. Length: 4.0-4.7 mm; width: 1.9-2.4 mm. Ratios. Width/length of prothorax: 1.57-1.64; width base/apex of prothorax: 1.29-1.34; length/width of elytra: 1.32-1.35; width of elytra/width of prothorax: 1.66-1.75.

Colour (Fig. 47). Upper and lower surfaces piceous to almost black, prothorax in some specimens slightly lighter than elytra. Elytra with light reddish discal spot of different size, but which is always somewhat cruciform and variegate, bearing some dark spots within and very serrate margins. Margins of elytra reddish, clypeus reddish, labrum, mouth parts, antennae, and legs yellow.

Male genitalia (Fig. 8). Rather large in comparison to body size. Genital ring large, stout, rather parallel, with wide, markedly asymmetric apex and short basis. Aedeagus elongate, lower surface barely concave, apex fairly elongate, not upturned but somewhat spoon-shaped. Orificium moderately large, almost completely situated on left side. Internal sac with a narrow, twisted, scleriotized rod at bottom, a sclerotized spine in middle, and a short, coarsely dentate plate at roof. Orificium with a triangular, finely denticulate plate. Both parameres rather short and compact, left one much larger than right one.

Female genitalia (Fig. 26). Stylomeres very small.

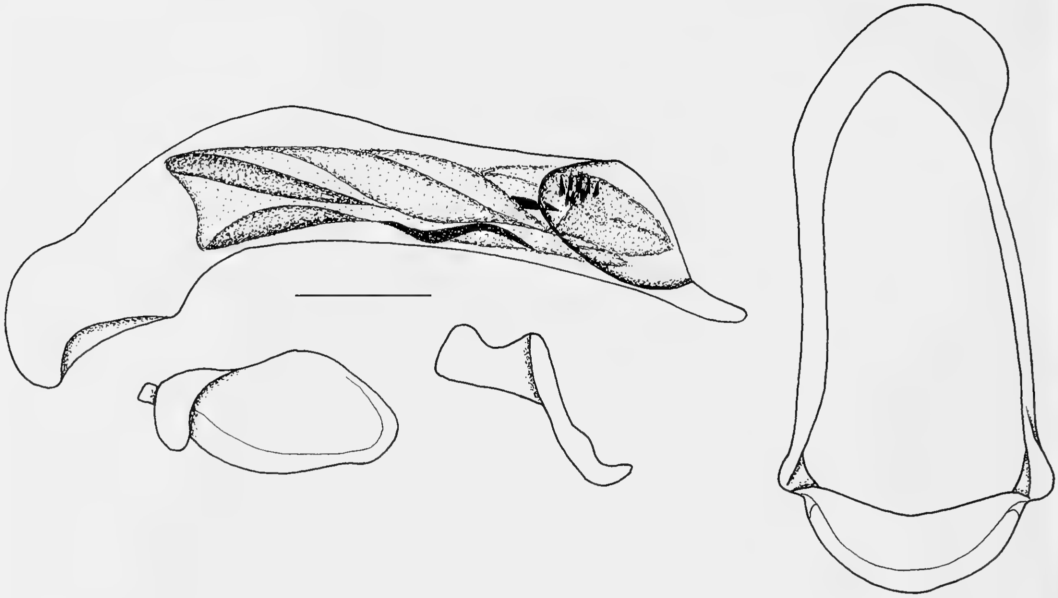


Fig. 8. *Cheilagona variabilis* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, rather acute apex; with two stout ventrolateral ensiform setae, one elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Apart from some variation in size, some variation of elytral pattern noted, as the elytral spot may be more or less dismembered.

Distribution. Whole New Guinea.

Collecting circumstances. Most specimens probably captured by sieving moss and litter from logs in upland rain forest.

New records. N. Guinea: NE Kaindi-Nami, 1700 m, 22.8.68 / J. Sedlacek Collector / *Agonochila variabilis* Darlington, Det. G. E. Ball 1989 (BMH); New Guinea Wau, 1750 m, 13.X.1965 / J. Sedlacek Collector (BMH); N. Guinea: NE Wau, Morobe-Distr. Mt. Missim, 1800 m, 22.IV.1966 / Gressitt, Wilkes Malaise Trap (BMH); N. Guinea: NE Bulolo R, 130 m, 17.8.69 / A. B. Micz Collector (BMH); NEW GUINEA: (NE) Karimui, South of Goroka, 1000 m, 7.6.1961 / J. L. & M. Gressitt Collectors (BMH); Papua NG, Morobe-Pr. Saureri, 10 km s. Garaina, 1550-1700 m, 27.3.1995, A. Riedel (CBM); Papua NG, Morobe-Pr. Aseki, Oiwa, 1600-1700 m and 1700-1800 m, 10.-11.4.1998 and 11.-12.4.1998, A. Riedel (CBM); PNG, Morobe Pr. Wau, Mt. Kaindi, 1550 m, 7.10.1992, leg. A. Riedel (CBM); Papua NG, Morobe-Pr. Aseki, 1000-1300 m, 13.10.1992, leg. A. Riedel (CBM); Papua NG, Morobe-Pr. Aiewa nr. Podu, s. Aseki, 1500-1700 m, 14.4.1998, leg. A. Riedel (CBM); Papua NIle. Guinée W. G. Ullrich / IV 79 PNG/WHProv. Bayer/Rokina (CBM); Irian Jaya, Jayawijaya Pt. Angguruk, 1200-1550 m, 23.9. 1992, leg. A. Riedel (CBM); IRIAN JAYA, Jayawijaya-Prov. leg. A. Riedel, 1993 / Bime, 1600-1900 m, 11.IX. (CBM); IRIAN JAYA, Jayawijaya-Prov. leg. A. Riedel, 1996 / Bommela, ca. 1700-1950 m, 4.X. (CBM); Irian Jaya, Panai-Pr., Epomani, Ugida, km 179, 1350-1400 m, 19.-20.1.1996, leg. A. Riedel (CBM); Irian Jaya, Manokwari Pr., Anggi, Gn. Disbehey, 2000-2150 m, 29.8.1991, leg. A. Riedel (CBM); Irian Jaya, Manokwari Pr., Anggi, Gn. Kobrey, 2000-2300 m, 28.8.1991, leg. A. Riedel (CBM).

Relationships. With respect to shape of aedeagus, less closely related to both, *C. gressitti* (Darlington) and *C. rufa* (Darlington).

Cheilagona rufa (Darlington) (comb. nov.)

Figs 9, 48

Agonochila rufa Darlington, 1968: 120; Lorenz 1998: 434.

Examined types. Holotype: ♀, NEW GUINEA (PAPUA) Bisianumu, E. of Port Moresby 500 m. Sept. 22. 1955 / J. L. Gressitt Collector / *rufa* / Holotype *Agonochila rufa* Darl. (BMH). – Paratypes: 1♂, NEW GUINEA: PAPUA, Keparra-Sangi, nr. Kokoda, 500 m. III-26-1956 / Sago Palm / J. L. Gressitt Collector / Paratype *Agonochila rufa Darl. (BMH).*

Diagnosis. Easily recognized from the patterned species by unicolourous red surface. Distinguished

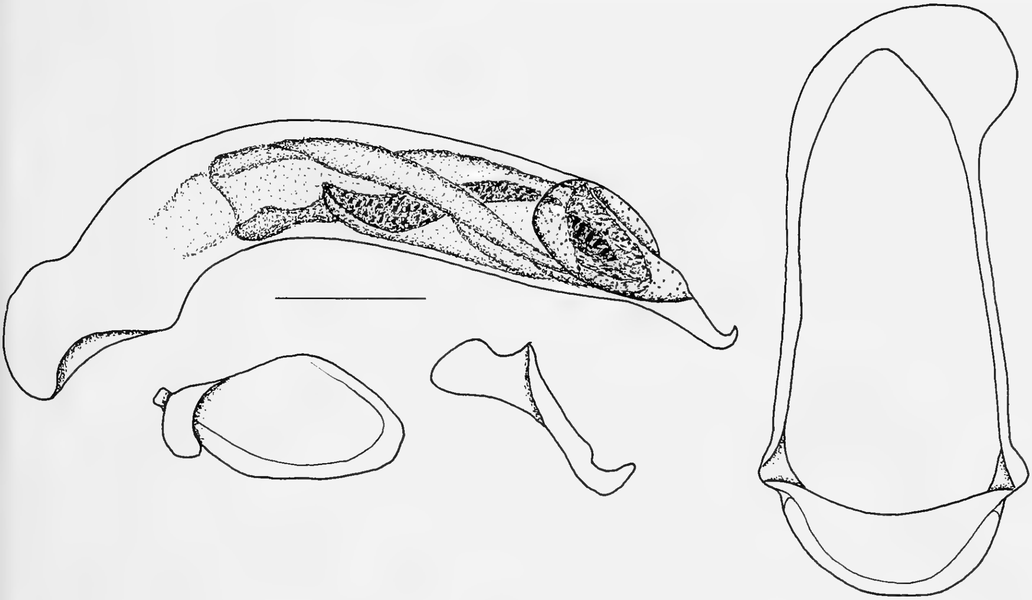


Fig. 9. *Cheilagona rufa* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.5 mm.

from *C. nigropicea*, spec. nov. by lighter colour, narrower prothorax with narrower base, longer elytra with more depressed intervals, absence of microreticulation on elytra, and coarser and denser punctuation.

Supplementary description

Measurements. Length: 4.0-4.8 mm; width: 2.05-2.40 mm. Ratios. Width/length of prothorax: 1.54-1.60; width base/apex of prothorax: 1.37-1.40; length/width of elytra: 1.36-1.40; width of elytra/width of prothorax: 1.63-1.70.

Colour (Fig. 48). Upper and lower surfaces uniformly reddish, antennae, mouth parts, and legs yellow.

Male genitalia (Fig. 9). Very large in comparison to body size. Genital ring large, elongate, rather parallel, with wide, remarkedly asymmetric apex and short basis. Aedeagus elongate, lower surface gently bisinuate, apex fairly elongate, markedly upturned and spoon-shaped. Orificium moderately large, almost completely situated on left side. Internal sac with one elongate and one short, coarsely denticulate, sclerotized plate. Orificium with a triangular, finely denticulate plate. Both parameres short and compact, left one much larger than right one.

Female genitalia. Similar to those of *C. nigropicea*, spec. nov.

Variation. Little variation noted, apart from some differences of body size.

Distribution. So far recorded only from eastern Papua New Guinea.

Collecting circumstances. Unknown.

New records. 1♂, NG. Bulolo R 700 m, 20.8.1970 / J. Sedlacek Collector (BMH); 1♂, Managalase Plateau, Northern District, Papua, Nov. 1972, R. Hornabrook (CBM).

Relationships. Probably nearest related to the likewise unicolourous *C. nigropicea*, spec. nov.

Cheilagona nigropicea, spec. nov.

Figs 27, 49

Types. Holotype: ♀, Irian Jaya, Panai-Pr. Epomnai, Ugida, km 179, 1350-1400 m, 19.-20.1.1996, leg. A. Riedel (CBM). – Paratype: 1♀, same data (CBM).

Diagnosis. Easily recognized from the patterned species by unicolourous piceous surface. Distinguished from *C. rufa* (Darlington) by darker colour, wider prothorax with wider base, shorter elytra with more convex intervals, presence of traces of microreticulation on elytra, and less coarse and less dense punctuation.

Description

Measurements. Length: 4.4-4.6 mm; width: 2.2-2.3 mm. Ratios. Width/length of prothorax: 1.66-1.67; width base/apex of prothorax: 1.44-1.48; length/

width of elytra: 1.31-1.32; width of elytra/width of prothorax: 1.65.

Colour (Fig. 49). Upper and lower surfaces uniformly piceous, only margins of pronotum and elytra reddish. Labrum light reddish, antennae, mouth parts, and legs yellow.

Head. Moderately wide, narrower than pronotum. Frons in middle with a deep, punctiform groove. No longitudinal furrows medially of eyes. Eyes large, markedly protruding. Clypeo-frontal suture deep. Clypeus in middle depressed, anterior margin straight. Labrum elongate, apex convex, 6-setose, lateral margins with additional hairs. Mandible with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, labial palpus apparently impilose, maxillary palpus with sparse and very fine pilosity. Mentum with sharp, unidentate tooth. Antenna short, surpassing basal angle of pronotum by about two antennomeres, median antennomeres slightly longer than wide, densely pilose from apex of 4th antennomere, basal antennomeres sparsely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Frons and clypeus irregularly punctate and with rather elongate, more or less erect pilosity, surface highly glossy.

Pronotum. Moderately wide, not cordiform, dorsally rather convex. Base much wider than apex, apex almost straight, anterior angles not produced, evenly rounded. Sides almost evenly rounded, widest behind middle, at position of anterior lateral seta. At this position margin with a very obtuse angle. Margin not sinuate in front of basal angles which are angulate but not rectangular. Posterior marginal seta situated at basal angle. Base gently convex though not pedunculate. Both, base and apex bordered throughout. Lateral channel narrow, distinctly separated from the convex disk. Median line gently impressed. Basal grooves fairly deep, oblique, prebasal transverse sulcus indistinct. Microreticulation absent, punctuation irregular, fine and rather sparse. Surface glossy, with moderately dense, rather elongate, erect, yellow pilosity, margins impilose.

Elytra. Rather short and wide, oviform, widest behind middle, dorsally very convex. Humeri rounded, sides evenly convex, apex oblique, gently sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, punctate, intervals distinctly convex. Superficial traces of about isodiametric microreticulation present, whole surface densely punctate and pilose. Pilosity dense, yellow, rather short, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the very short setae hardly discernible within the dense punctuation and pilosity. Marginal setae of moderate size. Lateral margin impilose. Surface glossy. Posterior wings fully developed.

Lower surface. Episterna and epimera of pro- and mesothorx impunctate and impilose, rest of lower surface rather sparsely punctate and pilose, pilosity more or less erect. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum of female 4-setose.

Legs. Of moderate size, pilose, though upper surfaces of tibiae not plainly pilose. Claws large, with four medium sized denticles. Structure of male protarsus unknown.

Male genitalia. Unknown.

Female genitalia (Fig. 27). Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate apex; with two stout ventro-lateral ensiform setae, one very elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Little variation recognized.

Distribution. Western Irian Jaya. Known only from type locality.

Collecting circumstances. Probably sieved from fallen logs in rain forest.

Etymology. The name refers to the dark colouration.

Relationships. Probably nearest related to the likewise unicolourous *C. rufa* (Darlington).

Cheilagona stictica (Blackburn) (comb. nov.)

Agonocheila stictica Blackburn, 1895: 201; Moore et al. 1987: 291.

Note. This species from northern Queensland clearly belongs in *Cheilagona*. The identity of the newly recorded specimens was confirmed by comparison with the types in BMNH.

New records. Australien Qld. Atherton, 2.1.1982, M. Baehr (CBM).

Cheilagona ovalis (Sloane) (comb. nov.)

Agonochila ovalis Sloane, 1923: 39; Moore et al. 1987: 291.

Note. This species from northern Queensland is rather similar to *C. variabilis* (Darlington) from New Guinea and clearly belongs in *Cheilagona*. The identity of the newly recorded specimen of this species was confirmed by comparison with the type in BMNH.

New records. Australien Qld. Atherton, 2.1.1982, M. Baehr (CBM).

Genus *Pseudoplatia*, gen. nov.

Diagnosis. Genus of Lebiinae, mainly characterized by the following character states: rather depressed body; more or less wide, depressed, and mostly distinctly cordiform pronotum; depressed, moderately ovate, but not quadrate elytra; presence of rather elongate and partly erect pilosity on head, pronotum, and elytra; presence of a dense fringe of elongate setae on the margins of pronotum and elytra; plainly pilose upper surface of tibia; quadrisetose male and female terminal abdominal sternites; presence of a notch near apex of middle tibia in males; usually much variegated elytral pattern of one, two, or most commonly three transverse rows of light spots, very rarely elytra with a large, irregular, common spot in middle; small aedeagus with elongate apex, without any strongly sclerotized plates or rods, and with a remarkably elongate orificium.

Type species. *Minuthodes sedlacekorum* Darlington, by present designation.

Distribution. New Guinea.

Relationships. This genus probably takes an intermediate position between *Minuthodes* in its restricted sense and the Australian *Agonocheila*. For more exact definition, however, better knowledge of the systematics of the latter genus would be needed.

Etymology. The name refers to the close relationship of this genus to previous *Platia* which is the older, preoccupied name of *Minuthodes*.

Key to the species of the genus *Pseudoplatia*, gen. nov.

1. Elytra without a pattern of many interrupted light longitudinal lines (Figs 50-52) .... 2.
– Elytra with a pattern of many interrupted light longitudinal lines (Figs 53-63) .... 4.

2. Elytra with two irregular transverse fasciae behind middle that may be expanded to the humeri to form a very irregularly margined, anteriomedially deeply incised light spot that may cover almost the whole disk, but has always a small, transverse, black patch within in posterior part (Fig. 50); aedeagus with moderately elongate apex (Fig. 10). Papua New Guinea to eastern central Irian Jaya .... *expansa* (Darlington)
– Elytra with a fairly regular common postmedian fascia or a large patch that may be slightly incised anteriorly, but never has a black patch within (Figs 51, 52); aedeagus with remarkably short and stout apex (Fig. 11), or unknown .... 3.

3. Size large, length >6 mm; pronotum wider, ratio w/l>1.8, with less suddenly upturned lateral margins; elytral pattern variable, but the light spot larger (Fig. 51); aedeagus see fig. 11. Papua New Guinea to eastern central Irian Jaya at high altitude (>2000 m) .... *dorsata dorsata* (Darlington)
– Size smaller, length 5.4 mm; pronotum narrower, ratio w/l 1.75, with remarkably upturned lateral margins; elytra with a rather small and narrow, common light patch in apical half (Fig. 52); aedeagus unknown. Eastern central Papua New Guinea at low altitude (800 m) .... *dorsata minor*, subspec. nov.

4. Intervals of elytra distinctly microreticulate, quite dull; pronotum narrower, in middle rather convex, lateral margins narrow, barely explanate, ratio w/l<1.6 (Fig. 53); body size small, length <4.5 mm; aedeagus with comparatively short apex and short orificium (Fig. 12). Eastern central Papua New Guinea .... *minuthoides* (Darlington)
– Intervals of elytra not or feebly microreticulate, quite glossy; pronotum wider, in middle far less convex, lateral margins wide, markedly explanate, ratio w/l>1.65; body size variable, but usually larger; aedeagus with longer apex and longer orificium (Figs 13-22) .... 5.

5. Striae of elytra deeply punctate, punctures in striae decidedly coarser than punctures on intervals; rather small species, body length <4.8 mm (Fig. 54); aedeagus with comparatively short apex (Fig. 13). Eastern central Papua New Guinea .... *sedlacekorum* (Darlington)
– Striae of elytra more feebly punctate, punctures in striae not coarser than punctures on intervals; either larger species, body length >4.8 mm, usually >5 mm, or small species with body length 4.5-4.8 mm, but then punctures on intervals coarse and mostly transversely confluent; aedeagus usually with slightly longer apex (Figs 14-22) .... 6.

6. Small species, body length 4.5-4.8 mm; punctures on intervals coarse and mostly transversely confluent **and** pronotum moderately wide, ratio w/l<1.83 **and** light colour prevailing on elytra over dark spots (Fig. 55); aedeagus with comparatively short orificium, apex at tip slightly curved up (Fig. 14). Eastern central Papua New Guinea ....*drumonti*, spec. nov.
– Larger species, body length >4.8 mm, usually >5.0 mm; punctures on intervals variable, but far less confluent; **either** pronotum wide, ratio w/l>1.85 **or** dark colour prevailing on elytra over light spots (Figs 56-63); aedeagus usually with very elongate orificum and with more or less straight apex (Figs 15-22).......................... 7.
7. Large species, length usually >6.5 mm; microreticulation perceptible between punctures on intervals, surface less glossy...........................12.
– Smaller species, length <5.8 mm; microreticulation on intervals absent, surface very glossy ... 8.
8. Punctuation of elytral intervals fine, dense, and regular, 4-5 punctures pro interval (Fig. 59); aedeagus rather curved and with remarkably elongate right paramere but short and compact left paramere (Fig. 18). Eastern Irian Jaya .... *georgei*, spec. nov.
– Punctuation of elytral intervals coarser, less dense, and quite irregular, 2-3, rarely 4 punctures pro interval (Figs 56-58, 60); aedeagus usually less curved and with longer left paramere (Figs 15-17, 19). Western Irian Jaya, Papua New Guinea .... 9.
9. Elytra longer and more parallel, ratio l/w 1.39, **and** pronotum near base distinctly sinuate (Fig. 60); lower surface of aedeagus near apex slightly bisinuate (Fig. 19). Japen Island, Irian Jaya ... . *subnitens* (Darlington)
– Elytra shorter and less parallel, ratio l/w<1.35, usually less; if ratio >1.32, pronotum near base not sinuate **and** species from Papua New Guinea (Figs 56-58); lower surface of aedeagus near apex not bisinuate (Figs 15-17)...................... 10.
10. Elytra shorter and laterally more convex, ratio l/w<1.32; pronotum distinctly sinuate near basal angles (Figs 56, 57), not microreticulate; aedeagus with elongate apex, right paramere longer (Figs 15, 16). Western Irian Jaya..........11.
– Elytra longer and laterally less convex, ratio l/w 1.35; pronotum not sinuate near basal angles (Fig. 58), with traces of microreticulation; apex of aedeagus unknown, right paramere rather short and compact (Fig. 17). Northern Papua New Guinea .... *recticollis*, spec. nov.
11. Light colour on elytra prevailing over dark spots (Fig. 56); pronotum wider, ratio w/l>1.85 and with distinctly upturned lateral margin; elytra slightly longer, ratio l/w>1.3; aedeagus with absolutely straight apex (Fig. 15) .... *riedeli*, spec. nov.
– Dark colour on elytra prevailing over light spots (Fig. 57); pronotum narrower, ratio w/l<1.83, with rather deplanate lateral margins; elytra slightly shorter, ratio l/w 1.26; aedeagus with tip of apex slightly upturned (Fig. 16) .... *gerdi*, spec. nov.
12. Light spots on elytra small and yellow; light margin of pronotum and elytra wider, distinct; elytra laterally more convex; punctuation of elytra finer and sparser, diameter of punctures smaller than distance between them (Fig. 63); aedeagus see fig. 22. Western Irian Jaya............ .... *latipennis*, spec. nov.
– Light spots on elytra larger and reddish; light margin of pronotum and elytra narrower, rather indistinct; elytra laterally less convex; punctuation of elytra coarser and denser, diameter of punctures larger than distance between them (Fig. 61, 62); aedeagus see figs 20, 21 .... 13.
13. Pronotum narrower, ratio w/l<1.68; elytra slightly longer, ratio l/w>1.38; microreticulation on elytra barely perceptible, surface glossier (Fig. 62); lower surface of aedeagus near apex slightly bisinuate (Fig. 21). Central Papua New Guinea ....*missai*, spec. nov.
– Pronotum wider, ratio w/l 1.75; elytra slightly shorter, ratio l/w 1.34; microreticulation on elytra superficial though well perceptible, surface duller (Fig. 61); lower surface of aedeagus regularly concave (Fig. 22). Northern Irian Jaya .... *rossi* (Darlington)

Pseudoplatia expansa (Darlington) (comb. nov.)

Figs 10, 50

Agonochila expansa Darlington, 1968: 121; Lorenz 1998: 434.

Examined types. Holotype: ♀, NEW GUINEA: NE. Finisterre Range, Saidor: Kiambavi Vill. VIII-1-18-'58/ J. L. Gressitt Collector BISHOP / Holotype *Agonochila expansa* Darl. (BMH).

Diagnosis. Distinguished from almost all other species, except for *P. dorsata* (Darlington) by the colour pattern of the elytra that does not consist of many longitudinal spots; from the latter species distinguished by elytra bearing two markedly ser-

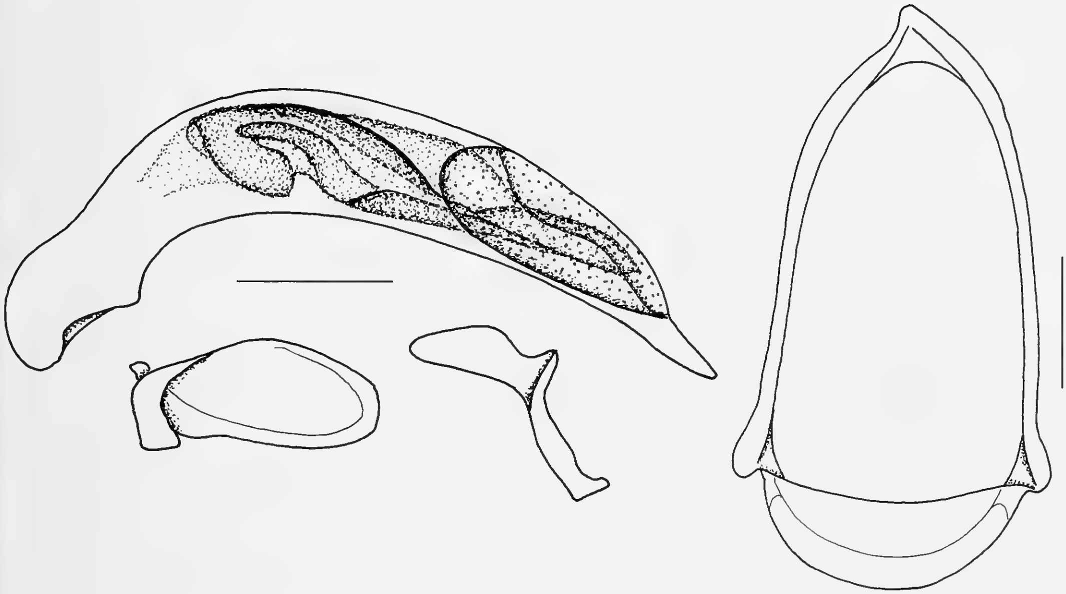


Fig. 10. *Pseudoplatia expansa* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

rate, transverse bands that may be confluent to a large light spot, but always bear two dark maculae at suture.

Supplementary description

Measurements. Length: 4.7-5.7 mm; width: 2.3-2.7 mm. Ratios. Width/length of prothorax: 1.80-1.88; width base/apex of prothorax: 1.11-1.16; length/width of elytra: 1.30-1.36; width of elytra/width of prothorax: 1.48-1.60.

Colour (Fig. 50). Upper and lower surfaces dark piceous to almost black. Elytra with two markedly serrate, transverse bands in posterior half that may be confluent to a large light spot that covers almost the whole of the elytra, but always bears two dark maculae at suture. Labrum slightly lighter than head, mouth parts and antennae yellow, legs dark, but knees and tarsi reddish.

Male genitalia (Fig. 10). Rather small in comparison to body size. Genital ring of moderate size, rather narrow, fairly symmetric, with narrow symmetric apex and short and wide basis. Aedeagus rather elongate, lower surface gently concave, apex elongate, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres elongate, left one much larger than right one.

Female genitalia. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Apart from the light elytral spot that much varies in size and shape, little variation noted.

Distribution. Papua New Guinea and eastern Irian Jaya.

New records. 1♂, NEW GUINEA: NE. East Highlands, Kainantu, 1500 m, 20.1.1966 / J. & M. Sedlacek M. V. Light trap (BMH); 1♂, N. Guinea: NE. Garaina, 800 m, 16.I.1958 / J. & M. Sedlacek Collectors (BMH); 1♂, 1♀, NEW GUINEA: SE. Woitape, 1550 m, 2-3.XI.65 / J. Sedlacek Collector (BMH); 1♂, Papua Nlle. Guinèe, W. G. Ullrich / XI 79 PNG/EHProv. Umg. Kainantu Onerunka (CBM); 1♂, IRIAN JAYA, Jayawijaya-Prov. leg. A. Riedel, 1993 / N. Bime, 2000-2070 m, 21.IX (CBM); 1♀, Irian Jaya, Jayawijaya Pr. Bommela, 1750 m, 30.8.-1.9. 1992, leg. A. Riedel (CBM). 1♀, Papua N.G., Morobe Prov., leg. A. Riedel, Aseki, Oiwa, 1600-1700 m, 11.-13. III.1998 (CBM).

Relationships. With respect to the colour pattern of the elytra most closely related to *P. dorsata* (Darlington). In spite of the different elytral pattern, both mentioned species belong in the main body of the genus.

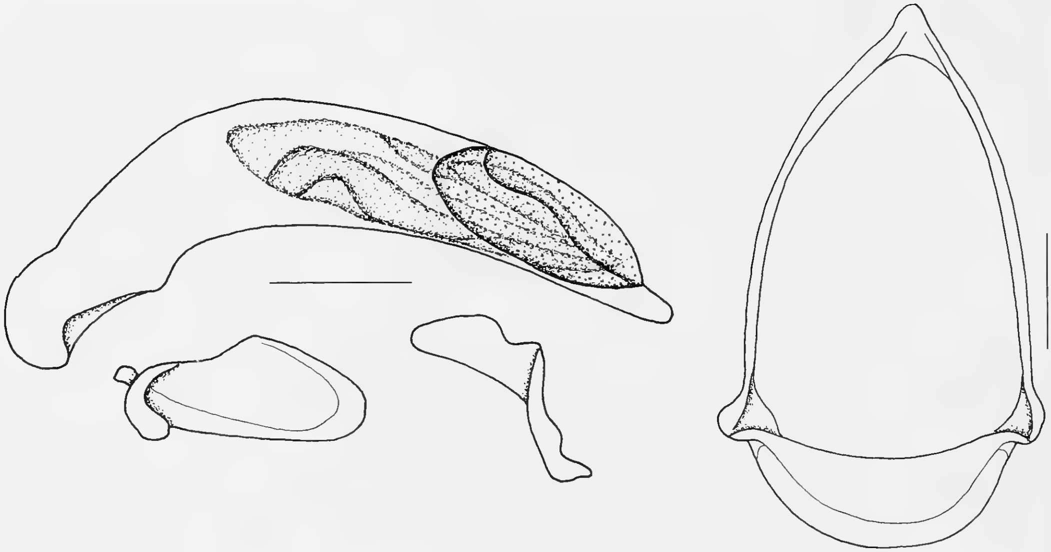


Fig. 11. *Pseudoplatia dorsata dorsata* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Pseudoplatia dorsata (Darlington) (comb. nov.)

This species apparently occurs in two different subspecies.

Pseudoplatia dorsata dorsata (Darlington)
Figs 11, 51

Agonochila dorsata Darlington, 1968: 121; Lorenz 1998: 434.

Examined types. Holotype: ♂, NEW GUINEA: NE. Kepilam, 2450 m, 21.VI.1963 / J. Sedlacek Collector BISHOP / Holotype *Agonochila dorsata* Darl. (BMH). – Paratypes: 2♀♀, same data (BMH).

Diagnosis. Distinguished from almost all other species, except for *P. expansa* (Darlington) by colour pattern of the elytra that does not consist of many longitudinal spots; from the latter species distinguished by the more or less extended, but always complete elytral spot that never bears any dark maculae within. Distinguished from *P. dorsata minor*, subspec. nov. by larger size and wider prothorax with less markedly upturned lateral margins.

Supplementary description

Measurements. Length: 6.1-6.5 mm; width: 2.9-3.1 mm. Ratios. Width/length of prothorax: 1.80-1.86; width base/apex of prothorax: 1.11-1.14; length/width of elytra: 1.36-1.39; width of elytra/width of prothorax: 1.58-1.63.

Colour (Fig. 51). Upper and lower surfaces dark piceous to almost black. Elytra with a rather large discal spot that may more or less extended, but never bears any dark maculae within. Labrum slightly lighter than head, mouth parts and antennae yellow, legs dark, but knees and tarsi reddish.

Male genitalia (Fig. 11). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus moderately elongate, lower surface gently concave, apex comparatively short, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and likewise without a denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Apart from the light elytral spot that much varies in size and shape, little variation noted.

Distribution. Papua New Guinea and eastern Irian Jaya. All records so far from quite high altitude.

New records. 1♀, NEW GUINEA: Kainantu, 2100-2240 m, 8.I.1965 / J. &. M. Sedlacek Collectors BISHOP MUSEUM / *Agonochila dorsata* Darlington det. G. E. Ball, 1989 (BMNH); 1♂, Irian Jaya, Jayawijaya Pr. Bommela, 1750 m, 30.8.-1.9.1992, leg. A. Riedel (CBM).

Relationships. With respect to colour pattern of the elytra, most closely related to *P. expansa* (Darlington). In spite of the different elytral pattern, both mentioned species belong in the main body of the genus.

Pseudoplatia dorsata minor, subspec. nov.

Fig. 52

Types. Holotype: ♀, N. Guinea: NE Garaina, 800 m, 16.I.1968 / J. & M. Sedlacek Collectors BISHOP / *Agonochila dorsata* Darlington Det. G. E. Ball 1989 (BMH).

Diagnosis. Distinguished from nominate form by lesser size and narrower prothorax with remarkedly upturned lateral margins.

Description

Measurements. Length: 5.4 mm; width: 2.5 mm. Ratios. Width/length of prothorax: 1.75; width base/apex of prothorax: 1.10; length/width of elytra: 1.35; width of elytra/width of prothorax: 1.60.

Colour (Fig. 52). As in nominate subspecies, but elytral spot even smaller and restricted to five inner intervals and apical half of elytra.

Head. As in nominate subspecies.

Prothorax. As in nominate subspecies, but narrower and with slightly narrower base. Lateral margins even more upturned, hence marginal channel deeper.

Elytra. As in nominate subspecies, but slightly shorter.

Lower surface. As in nominate subspecies.

Legs. As in nominate subspecies.

Male genitalia. Unknown.

Female genitalia. As in nominate subspecies.

Variation. Unknown.

Distribution. Eastern central Papua New Guinea, at rather low altitude. Known only from type locality.

Collecting circumstances. Unknown.

Etymology. The name refers to the lesser size as compared with the nominate subspecies.

Note. According to the collecting circumstances of the holotype, this may be the lowland form of *P. dorsata*.

Pseudoplatia minuthoides (Darlington) (comb. nov.)

Figs 12, 28, 53

Agonochila minuthoides Darlington, 1968: 119; Lorenz 1998: 434.

Examined types. Holotype: ♂, Didiman Ck., Lae, N.G. III-27-55' EO Wilson lowl. rainfor. / M.C.Z. Holotype 31418 / Holotype *Agonochila minuthoides* Darl. (MCZ). – Paratype: 1♂, NEW GUINEA (NE) Busu R., E. of Lae 100 m, Sept. 14, 1955 / J. L. Gressitt Collector / Paratype *Agonocheila minuthoides* Darl. (BMH).

Diagnosis. Small, rather convex species with elytral pattern of many longitudinal lines, distinguished from all other species by less protruding eyes, narrower, dorsally more convex pronotum without definitely explanate lateral margins, distinct microreticulation of intervals, and short apex of the aedeagus.

Supplementary description

Measurements. Length: 3.8-4.5 mm; width: 1.90-2.15 mm. Ratios. Width/length of prothorax: 1.52-1.58; width base/apex of prothorax: 1,21-1.24; length/width of elytra: 1.28-1.31; width of elytra/width of prothorax: 1.63-1.70.

Colour (Fig. 53). Upper and lower surfaces brown to piceous, margins of pronotum and elytra reddish. Elytra with a variegate pattern of numerous light, short longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibia slightly darker than femora.

Male genitalia (Fig. 12). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus rather elongate, lower surface gently concave, apex comparatively short, obtuse. Orificium large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia (Fig. 28). Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Due to scarce material, little variation noted.

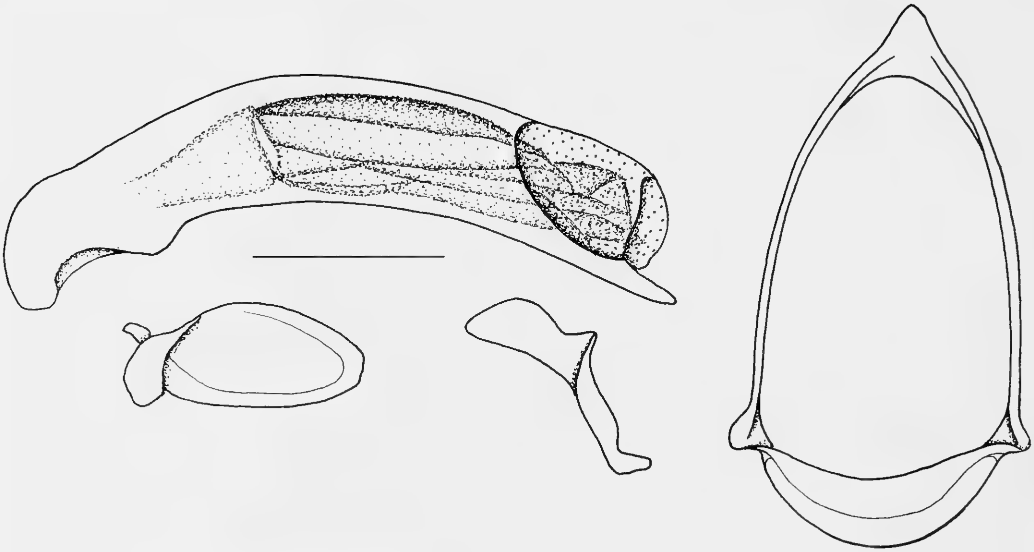


Fig. 12. *Pseudoplatia minuthoides* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Distribution. Central northern Papua New Guinea.

New records. 1♀, Canopy mission P.N.G. Madang province, Baiteta, FOG T10, 24.III.1994, Leg. Olivier Missa (CBM); 1♀, PAPUA NEW GUINEA, Madang Province, 16 km WNW of Sapi Forest Reserve, 160 m, 5°10'S, 145°26'E, 8 Apr. 1989, Stop #89-67B / D. H. Kavanaugh, G. E. Ball & N. D. Penny colls. (CAS).

Relationships. In spite of its variegate elytral pattern, this is probably the adelphotaxon of all other species and altogether the most basic species of the genus.

Pseudoplatia sedlacekorum (Darlington) (comb. nov.)

Figs 13, 54

Minuthodes sedlacekorum Darlington, 1968: 97; Lorenz 1998: 434.
Agonochila duplicata Darlington, 1968: 119; Lorenz 1998: 434 (**syn. nov.**).

Examined types. Of *sedlacekorum:* Holotype: ♂, NEW GUINEA: (NE) Wau, Morobe Distr 1050 m, 14.XI.1961 / J. & M. Sedlacek Collectors / Holotype *Minuthodes sedlacekorum* Darl. (BMH).

Of *duplicata*: Holotype: ♂, N. Guinea Birò 1899 / Sattelberg Huon-Golf. / Holotype *Agonochila duplicata* Darl. (HNMB).

Note. The unique type of *P. duplicata* agrees in all important external and genital characters with the type of *P. sedlacekorum*, except that it is slightly smaller and has a narrower, laterally slightly less sinuate pronotum.

Diagnosis. Small, rather depressed species with elytral pattern of many longitudinal lines, distinguished from all other species except for *P. minuthoides* (Darlington) by considerably larger punctures on elytral striae than on intervals; and from the latter species by more protruding eyes, wider, dorsally more depressed pronotum with definitely explanate lateral margins, and absence of microreticulation on the elytra.

Supplementary description

Measurements. Length: 4.4-4.8 mm; width: 2.15-2.3 mm. Ratios. Width/length of prothorax: 1.74-1.83; width base/apex of prothorax: 1.19-1.21; length/width of elytra: 1.30-1.35; width of elytra/width of prothorax: 1.51-1.53.

Colour (Fig. 54). Upper surfaces of head and prothorax and lower surface reddish to light brown, surface of elytra more or less dark piceous. Margins of pronotum and elytra indistinctly reddish. Elytra with a variegate pattern of numerous yellow to light reddish, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Usually a larger part of the elytra is light than dark, in particular in the basal half. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibia slightly darker than femora.

Male genitalia (Fig. 13). Rather small in com-

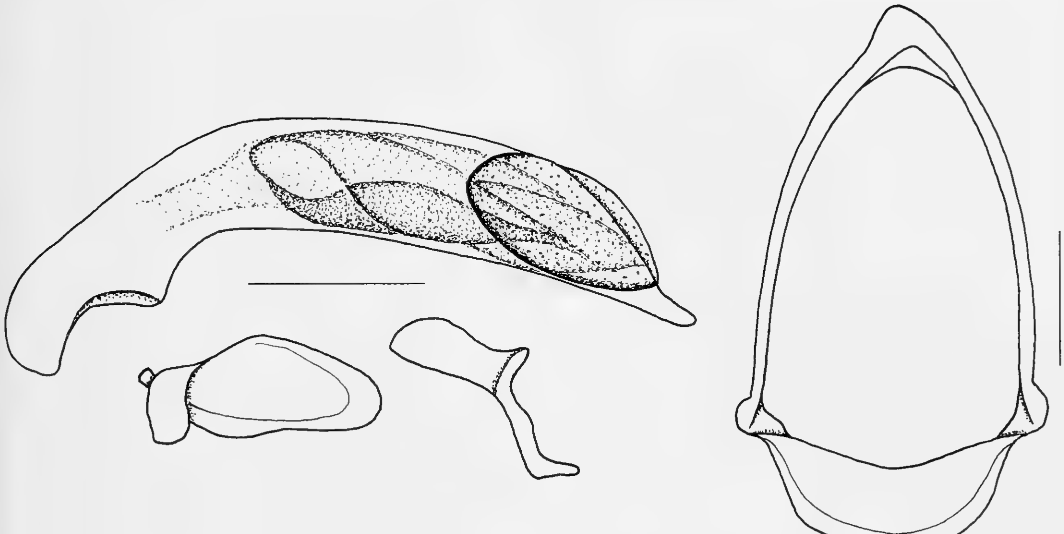


Fig. 13. *Pseudoplatia sedlacekorum* (Darlington). Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

parison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus rather elongate, lower surface barely concave, apex comparatively short, obtuse. Orificium large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres elongate, left one much larger than right one.

Female genitalia. Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. In the holotype of *Agonocheila duplicata* Darlington the pronotum is slightly less sinuate posteriorly and thus the basal angles are slightly more obtuse.

Distribution. Central eastern and northern Papua New Guinea.

New records. 1♀, same data as holotype of *P. sedlacekorum* (BMH); 1♂, PAPUA NEW GUINEA Morobe Pr. Wau. Wau Ecol. Inst. 12-24 July 1983, S. E. & P. M. Miller. 1200 m. Second. Montane Forest (CAS).

Collecting circumstances. The few specimens collected in montane forests of median altitude.

Relationships. Very similar to *P. drumonti*, spec. nov. Both species together may form the adelphotaxon of all other species except for *P. minuthoides* (Darlington).

Pseudoplatia drumonti, spec. nov.

Figs 14, 29, 55

Types. Holotype: ♂, Canopy mission P.N.G. Madang province, Baiteta, FOG T4, 6.IV.1993, Leg. Olivier Missa (IRSNB). – Paratypes: 5♂♂, 4♀♀, same locality and collector: FOG T9, 1.VI.1994; FOG T3, 31.III.1993; FOG M2, 30.III.1993 (CBM, IRSNB).

Diagnosis. Distinguished from most species of *Pseudoplatia* by combination of rather small size and wide, depressed pronotum bearing explanate margins; distinguished from most similar *P. sedlacekorum* (Darlington) by punctuation of intervals coarse and about as large as that of striae, margins of pronotum more decidedly sinuate near basal angles, and aedeagus with slightly longer and at tip gently upturned apex.

Description

Measurements. Length: 4.6-4.8 mm; width: 2.25-2.35 mm. Ratios. Width/length of prothorax: 1.79-1.83; width base/apex of prothorax: 1.16-1.20; length/width of elytra: 1.25-1.30; width of elytra/width of prothorax: 1.42-1.45.

Colour (Fig. 55). Upper and lower surfaces piceous, head usually even slightly darker. Margins

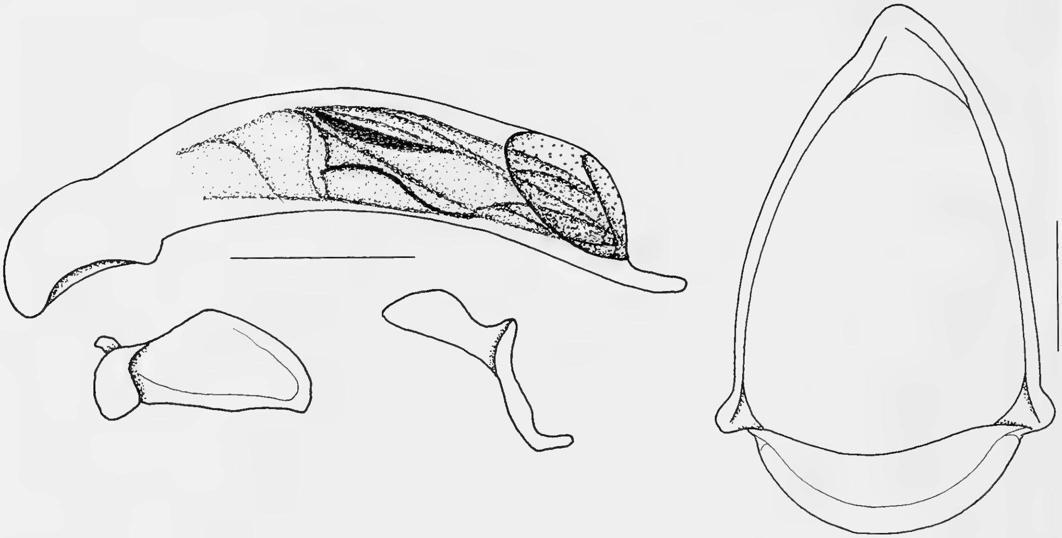


Fig. 14. *Pseudoplatia drumonti*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

of pronotum and elytra more or less widely reddish. Elytra with a variegate pattern of numerous yellow to light reddish, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Usually light and dark colour on elytra is about equally distributed. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibia slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices obtuse, both palpi finely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, barely surpassing basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Frons and clypeus densely, irregularly, and rather coarsely punctate and with rather elongate, more or less erect pilosity, surface glossy.

Pronotum. Wide, faintly cordiform, dorsally depressed. Base much wider than apex, apex concave, anterior angles produced but evenly rounded. Sides anteriorly evenly rounded, widest slightly in front of middle, at position of anterior lateral seta. At this position margin with a very obtuse angle. Margin faintly sinuate in front of basal angles which are distinct but slightly obtuse and not rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Both, base and apex bordered throughout. Lateral channel wide, depressed, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves fairly deep, oblique, prebasal transverse sulcus shallow. Apical transverse sulcus distinct though interrupted in middle. Microreticulation absent, punctuation dense, somewhat confluent, moderately fine. Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Short and wide, rather quadrate, little widened behind middle, dorsally depressed. Humeri rounded, sides gently convex, apex oblique, gently sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals perceptibly convex. Microreticulation absent, whole surface densely and coarsely punctate, punctures irregularly confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface very glossy. Posterior wings fully developed.

Lower surface. Lower surface of head, prosternum, and surfaces of meso- and metathorax and of abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, <1.5 × as long as wide at apex. Terminal abdominal sternum in both sexes quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with three minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically and densely squamose.

Male genitalia (Fig. 14). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus rather elongate, lower surface gently concave, apex fairly elongate, slightly curved up, obtuse. Orificium moderately large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres rather elongate, left one much larger than right one.

Female genitalia (Fig. 29). Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Very little variation noted.

Distribution. Eastern central Papua New Guinea. Known only from type locality.

Collecting circumstances. Fogged from trunk or lower canopy of standing trees of the species *Dracontomelon dao* and *Pometia pinnata* in lowland rain forest close to the coast.

Etymology. The name honours A. Drumont of IRSNB who kindly made available to me the most interesting Baiteta sample of New Guinean carabids.

Relationships. See under *P. sedlacekorum* (Darlington).

Pseudoplatia riedeli, spec. nov.

Figs 15, 30, 56

Types. Holotype: ♂, Irian Jaya, Vogelkop, Testega,1100-1300 m, 30.3.-12.4.1993, leg. A. Riedel (CBM). – Paratypes: 1♀, same data (CBM); 1♀, Irian Jaya, Vogelkop, Meydougda,1200-1400 m, 5.4.1993, leg. A. Riedel (CBM); 1♀, Irian Jaya, Panai-Pr., Epomani, Ugida, km 179, 1350-1400 m, 19.-20.1.1996, leg. A. Riedel (CBM).

Diagnosis. Characterized, at the same time, by moderate size, not microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from most similar *P. georgei*, spec. nov. by less dense punctuation of elytra, and from *P. gerdi*, spec. nov. by much more extended light elytral colouration and straight apex of aedeagus.

Description

Measurements. Length: 4.8-5.5 mm; width: 2.35-2.75 mm. Ratios. Width/length of prothorax: 1.85-1.88; width base/apex of prothorax: 1.16-1.20; length/width of elytra: 1.30-1.32; width of elytra/width of prothorax: 1.47-1.54.

Colour (Fig. 56). Upper and lower surfaces piceous to almost black. Pronotum and elytra with very narrow and inconspicuous reddish margin. Elytra with a variegate pattern of numerous yellow to light reddish, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Distribution of light colour on elytra more extended than dark colour. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibiae slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, barely surpassing basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons densely, irregularly, and coarsely punctate and with rather elongate, more or less erect pilosity, posterior part of head with finer punctures. Surface glossy.

Pronotum. Wide, slightly cordiform, dorsally depressed. Base much wider than apex, apex very gently concave, anterior angles faintly produced but evenly rounded. Sides anteriorly evenly rounded, widest slightly in front of middle, at position of anterior lateral seta. At this position margin with a very obtuse angle. Margin faintly sinuate in front of basal angles which are distinct but slightly obtuse and not rectangular. Posterior marginal seta situ-

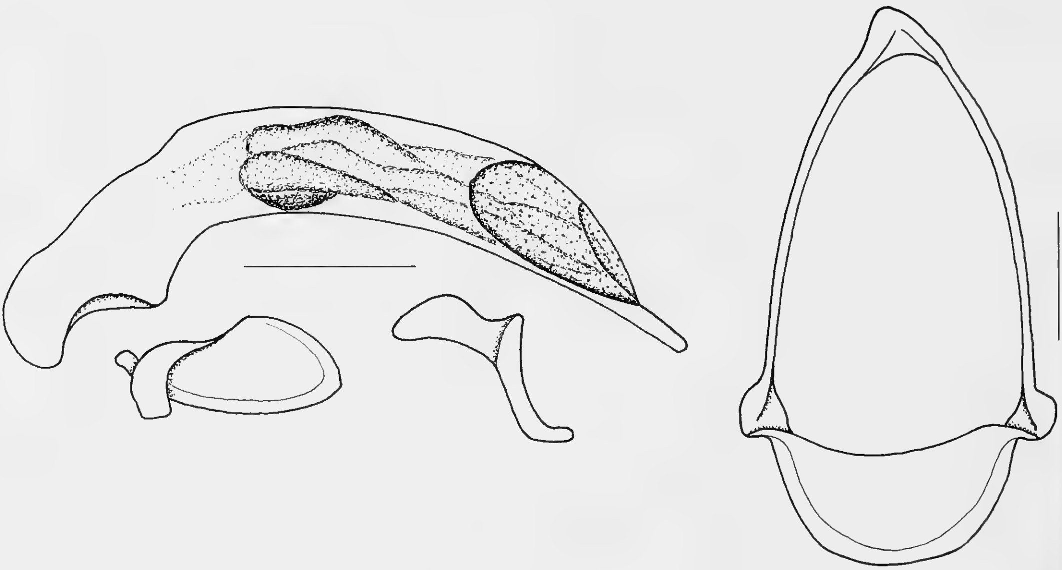


Fig. 15. *Pseudoplatia riedeli*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

ated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather deep, oblique, prebasal transverse sulcus fairly deep. Apical transverse sulcus distinct and barely interrupted in middle. Microreticulation absent, punctuation dense, somewhat confluent, on disk moderately fine, on lateral parts coarse and rugose. Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Short and wide, rather quadrate, little widened behind middle, dorsally depressed. Humeri rounded, sides gently convex, apex oblique, fairly sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Microreticulation absent, intervals rather densely and coarsely punctate in 2-3 rows, punctures in parts irregularly confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface very glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax and of abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum in both sexes quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 15). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and moderately short and wide basis. Aedeagus elongate, lower surface gently concave, apex elongate, absolutely straight, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres rather elongate, left one angulate at apex and much larger than right one.

Female genitalia (Fig. 30). Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, rather acute apex; with two fairly stout ventro-lateral ensiform setae, one very elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

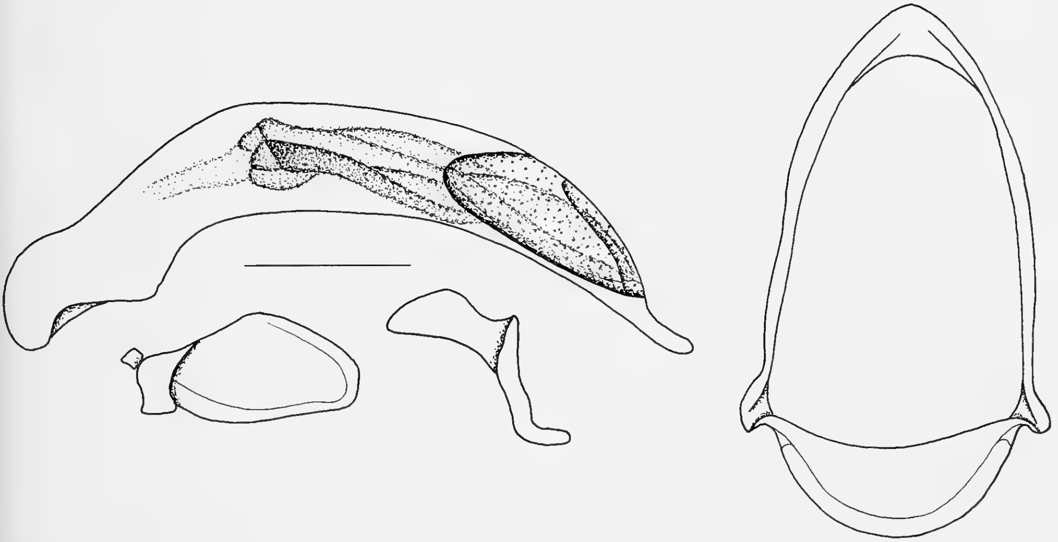


Fig. 16. *Pseudoplatia gerdi*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Variation. Some variation noted in body size and size of the light spots of the elytral colouration.

Distribution. Western Irian Jaya.

Collecting circumstances. Probably sieved from logs in rain forest at median altitude.

Etymology. The name honours A. Riedel, collector of this and of many other important New Guinean carabid species.

Relationships. Very similar to *P. gerdi*, spec. nov. and probably the adelphotaxon of that species.

Pseudoplatia gerdi, spec. nov.

Figs 16, 57

Types. Holotype: ♂, Irian Jaya, Fakfak-Pr., 20 km w. Timika, 30 m, 8.-11.1.1996, leg. A. Riedel (CBM).

Diagnosis. Characterized, at the same time, by moderate size, not microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from most similar *P. georgei*, spec. nov. by less dense punctuation of elytra; and from *P. riedeli*, spec. nov. by much more extensive dark colouration and slightly upturned apex of aedeagus.

Description

Measurements. Length: 5.0 mm; width: 2.4 mm. Ratios. Width/length of prothorax: 1.83; width base/apex of prothorax: 1.21; length/width of elytra: 1.26; width of elytra/width of prothorax: 1.43.

Colour (Fig. 57). Upper and lower surfaces piceous. Pronotum and elytra with inconspicuous reddish margin. Elytra with a variegate pattern of numerous yellow to light reddish, small, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Distribution of dark colour on elytra much more extended than light colour. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibia slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, barely surpassing basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum.

Clypeus and anterior part of frons densely, irregularly, and coarsely punctate and with rather elongate, more or less erect pilosity, posterior part of head with finer punctures. Surface glossy.

Pronotum. Wide, slightly cordiform, dorsally depressed. Base much wider than apex, apex very gently concave, anterior angles faintly produced but evenly rounded. Sides anteriorly evenly rounded, widest slightly in front of middle, at position of anterior lateral seta. At this position margin with a very obtuse angle. Margin barely sinuate in front of basal angles which are distinct but slightly obtuse and not rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather deep, oblique, prebasal transverse sulcus fairly deep. Apical transverse sulcus distinct, but interrupted in middle. Microreticulation absent, punctuation dense, on disk rather fine and regular, on lateral parts coarse and somewhat confluent. Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Short and wide, rather quadrate, little widened behind middle, dorsally depressed. Humeri rounded, sides gently convex, apex oblique, fairly sinuate, sutural angles rounded off, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Microreticulation absent, intervals rather densely and coarsely punctate in about two rows, punctures in parts irregularly confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface very glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax and of abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 16). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus elongate, lower surface gently concave, apex elongate, faintly curved up at tip and to the right side, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres rather elongate, left one transverse at apex and much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. Western Irian Jaya.

Collecting circumstances. Probably sieved from logs in rain forest at low altitude.

Etymology. The name honours Prof. Gerd Müller-Motzfeld, renowned authority of Bembidiini, on behalf of his 65th birthday.

Relationships. See under *P. riedeli*, spec. nov.

Pseudoplatia recticollis, spec. nov.

Figs 17, 58

Types. Holotype: ♂, D. N. Guinea, 850 m, Etappenbg. 28.X.-XI.11, Kais. Augustafl. Exp. Bürgers S. G. (MNHB).

Diagnosis. Characterized, at the same time, by moderate size, not microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum. Distinguished from most similar *P. georgei*, spec. nov. by less dense punctuation of elytra; and from *P. riedeli*, spec. nov., *P. gerdi*, spec. nov., and *P. subnitens* (Darlington) by not sinuate lateral margins of prothorax, slightly longer elytra, and still microreticulate surfaces of head and pronotum.

Description

Measurements. Length: 5.4 mm; width: 2.5 mm. Ratios. Width/length of prothorax: 1.83; width base/apex of prothorax: 1.26; length/width of elytra: 1.35; width of elytra/width of prothorax: 1.43.

Colour (Fig. 58). Upper surface dark piceous, but neck, clypeus, labrum, and lateral margins of pronotum and elytra reddish. Lower surface reddish except for the dark thoracic episterna and epimera. Elytra with a variegate pattern of numerous reddish, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Distribution of light colour on elytra slightly more extended than

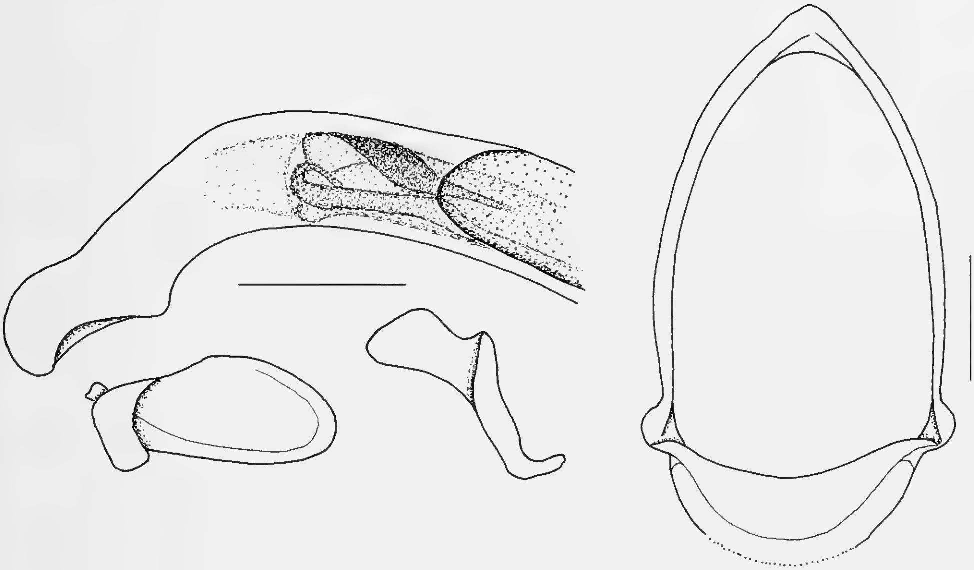


Fig. 17. *Pseudoplatia recticollis*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

dark colour. Mouth parts, antennae, and legs light reddish, tibia slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, barely surpassing basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Superficial traces of microreticulation present on whole surface between punctuation, present and isodiametric on labrum. Clypeus and anterior part of frons densely, irregularly, and coarsely punctate and with rather elongate, more or less erect pilosity, posterior part of head with finer punctures. Surface moderately glossy.

Pronotum. Wide, not cordiform, dorsally rather depressed. Base much wider than apex, apex gently concave, anterior angles slightly produced but evenly rounded. Sides evenly rounded throughout, widest slightly in front of middle, at position of anterior lateral seta. Margin not sinuate in front of basal angles which are distinct but slightly obtuse and not rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, not at all upturned, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves moderately deep, oblique, prebasal transverse sulcus rather shallow. Apical transverse sulcus shallow, barely interrupted in middle. Superficial traces of microreticulation present, punctuation dense though irregular, somewhat confluent, on disk moderately fine, on lateral parts coarse and rugose. Surface moderately glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Comparatively elongate, rather rectangular, barely widened behind middle, dorsally depressed. Humeri rounded, sides almost parallel, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Microreticulation absent, intervals rather densely and coarsely punctate in 2-3 rows, punctures in parts irregularly confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface glossy. Posterior wings fully developed.

Lower surface. Lower surfaces of head, prosternum, meso- and metathorax, and abdomen rather densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, $< 1.5 \times$ as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with three minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 17). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis that is partly destroyed. Aedeagus moderately elongate, lower surface gently concave, apex unknown, because the apical third of aedeagus is destroyed. Orificium very large, almost completely situated on left side. Internal sac apparently rather simply folded, without any sclerotized parts. Both parameres moderately elongate, left one much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. North-western Papua New Guinea. Known only from type locality

Collecting circumstances. Unknown.

Etymology. The name refers to the straight lateral pronotal margins in front of the basal angles.

Relationships. Referring to external characters, in particular the still present microreticulation of head and pronotum, less closely related to all species of the *riedeli*-group (*P. riedeli, P. gerdi, P. subnitens, P. georgei*), but the relationships remain somewhat obscure, because the apical part of the male aedeagus is yet unknown.

Pseudoplatia georgei, spec. nov.

Figs 18, 59

Types. Holotype: ♂, Irian Jaya, Jayawija-Pr., Yalmabi, 1200-1400 m, 8.X.1996, leg. A. Riedel (CBM).

Diagnosis. Characterized, at the same time, by moderate size, not microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum. Distinguished from all similar species by the dense punctuation of elytra.

Description

Measurements. Length: 5.6 mm; width: 2.65 mm. Ratios. Width/length of prothorax: 1.84; width base/apex of prothorax: 1.23; length/width of elytra: 1.37; width of elytra/width of prothorax: 1.43.

Colour (Fig. 59). Upper surface almost black, but neck and lateral margins of pronotum and elytra indistinctly reddish. Lower surface reddish to light piceous. Elytra with a variegate pattern of numerous short, yellow, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Distribution of dark colour on elytra slightly more extended than light colour. Labrum reddish, mouth parts, antennae, and legs yellow to light reddish, tibiae slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, barely surpassing basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons densely, irregularly, coarsely punctate and with rather elongate, more or less erect pilosity, posterior part of head with finer punctures. Surface glossy.

Pronotum. Wide, barely cordiform, dorsally depressed. Base much wider than apex, apex very gently concave, anterior angles faintly produced but evenly rounded. Sides anteriorly evenly rounded, widest about at middle, at position of anterior lateral seta. Margin barely sinuate in front of basal angles which are distinct but slightly obtuse and not rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, slightly upturned, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather deep, oblique, prebasal transverse sulcus fairly deep. Apical transverse sulcus distinct, but interrupted in middle. Microreticulation absent, punctuation dense, on disk rather fine and regular, on lateral parts coarse and somewhat confluent.

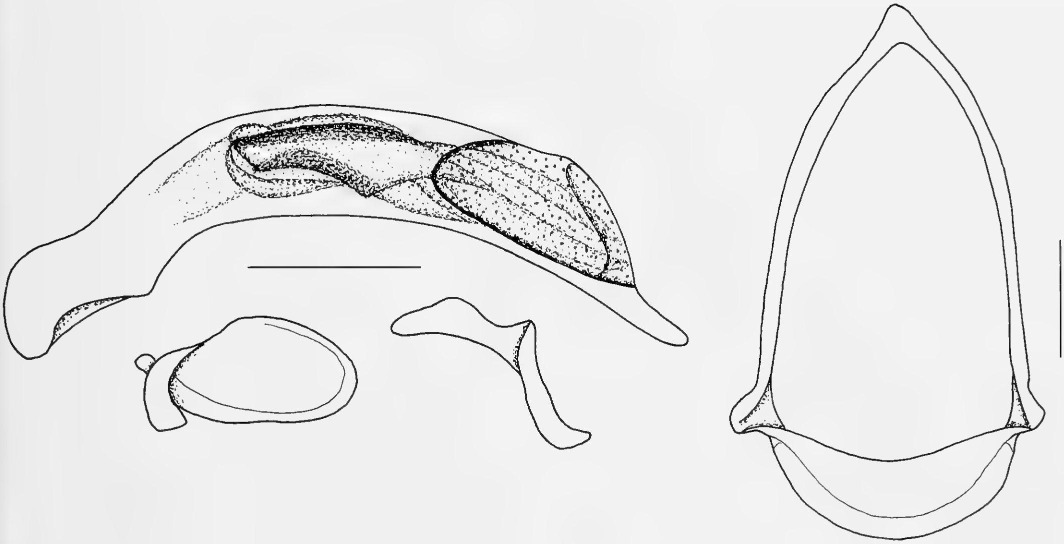


Fig. 18. *Pseudoplatia georgei*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Comparatively elongate, rather rectangular, not widened behind middle, dorsally depressed. Humeri rounded, sides gently convex, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Microreticulation absent, intervals densely and moderately coarsely punctate in 4-5 rows, punctures rather regular, barely confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface very glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax, and of abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with four minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia. (Fig. 18). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and short and wide basis. Aedeagus elongate, lower surface regularly concave, apex elongate, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Right paramere elongate, left one rather short, though much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. Eastern central Irian Jaya. Known only from type locality.

Collecting circumstances. Probably sieved from logs in rain forest.

Etymology. The name honours Prof. George Ball, outstanding authority of carabid beetles, on behalf of his 80th birthday.

Relationships. Closely related to *P. riedeli*, spec. nov. and *P. gerdi*, spec. nov., and perhaps the adelphotaxon of both species.

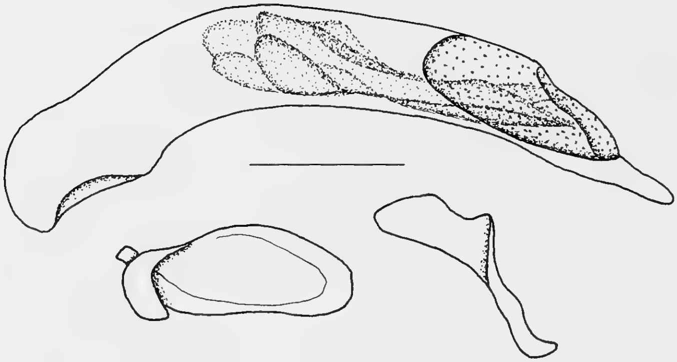


Fig. 19. *Pseudoplatia subnitens* (Darlington). Male genitalia: Aedeagus and parameres. Scale: 0.25 mm.

Pseudoplatia subnitens (Darlington) (comb. nov.)

Figs 19, 60

Minuthodes subnitens Darlington, 1968: 97; Lorenz 1998: 434.

Examined types. Holotype: ♂, DUTCH NEW GUINEA Japen I., Mt. Baduri. 1000 ft., viii.1938. L. E. Cheesman. B.M. 1938-593. / Holotype *Minuthodes subnitens* Darl. (BMNH).

Diagnosis. Characterized, at the same time, by fairly large size, not microreticulate surface or elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from *P. punctatipennis*, spec. nov. by less dense punctuation of elytra, and from all other similar species by combination of elongate elytra **and** distinctly sinuate pronotum.

Description

Measurements. Length: 5.75 mm; width: 2.7 mm. Ratios. Width/length of prothorax: 1.86; width base/apex of prothorax: 1.22; length/width of elytra: 1.39; width of elytra/width of prothorax: 1.45.

Colour (Fig. 60). Upper surface almost black, but neck and lateral margins of pronotum and elytra very indistinctly reddish. Lower surface piceous. Elytra with a variegate pattern of numerous light reddish, longitudinal stripes which form three indistinct, oblique, irregularly v-shaped bands. Distribution of light colour on elytra slightly more extended than dark colour. Labrum reddish, mouth parts, antennae, and legs light reddish, tibiae slightly darker than femora.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, surpassing basal angle of pronotum by one antennomere, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons with dense, rather regular, moderately coarse punctuation and with rather elongate, more or less erect pilosity, posterior part of head with slightly finer punctures. Surface glossy.

Pronotum. Wide, slightly cordiform, dorsally depressed. Base much wider than apex, apex gently concave, anterior angles slightly produced but evenly rounded. Sides anteriorly evenly rounded, widest about at middle, at position of anterior lateral seta. Margin distinctly sinuate in front of basal angles which are quite angulate and almost rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, faintly upturned, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather deep, oblique, prebasal transverse sulcus fairly deep. Apical transverse sulcus distinct, but interrupted in middle. Microreticulation absent, punctuation dense, on disk rather fine and regular, on lateral parts coarse and somewhat confluent. Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Comparatively elongate, rather rectangular, not widened behind middle, dorsally depressed. Humeri rounded, sides gently convex, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Microreticulation absent, intervals coarsely and moderately densely punctate in about two rows, punctures rather regular, barely confluent, about as coarse as punctures of striae. Pilosity rather dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface very glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax, and abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect. Metepisternum comparatively short, <1.5× as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 19). Rather small in comparison to body size. Genital ring lacking in holotype. Aedeagus rather elongate, lower surface gently concave in basal two thirds, then gently bisinuate, apex rather elongate, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres fairly elongate, left one much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. Japen Island, Irian Jaya. Known only from type locality.

Collecting circumstances. Unknown.

New records. None.

Relationships. Probably the adelphotaxon of *P. georgei*, spec. nov., and *P. riedeli*, spec. nov. and *P. gerdi*, spec. nov.

Pseudoplatia rossi (Darlington) (comb. nov.)

Figs 20, 61

Minuthodes rossi Darlington, 1968: 97; Lorenz 1998: 434.

Types. Holotype: ♂, Maffin Bay, Dutch N. Guinea, IX.44 E. S. Ross Coll. / Holotype *Minuthodes rossi* D. (CAS type Nr. 11212).

Diagnosis. Characterized, at the same time, by large size, microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from *P. latipennis*, spec. nov. by laterally less convex elytra and longer light elytral spots, and by narrower prothorax; and from *P. missai*, spec. nov. by wider prothorax with wider base, and slightly shorter elytra.

Description

Measurements. Length: 6.6 mm; width: 3.05 mm. Ratios. Width/length of prothorax: 1.75; width base/apex of prothorax: 1.21; length/width of elytra: 1.34; width of elytra/width of prothorax: 1.40.

Colour (Fig. 61). Upper surface piceous, but neck, clypeus, labrum, the wide lateral margins of pronotum and the narrow margins of elytra dark reddish, pronotum also in middle of apex and base dark reddish. Lower surface of head, thorax, and abdomen reddish, except for episterna and epimera. Elytra with a variegate pattern of numerous reddish, more or less elongate spots which form three indistinct, oblique, irregularly v-shaped bands. Distribution of light colour on elytra about as extended as dark colour. Mouth parts, antennae, and legs reddish, femora light reddish.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, surpassing basal angle of pronotum by one antennomere, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons with dense, rather regular, moderately coarse punctuation and with elongate, more or less erect pilosity, posterior part of head with slightly finer punctures. Surface glossy.

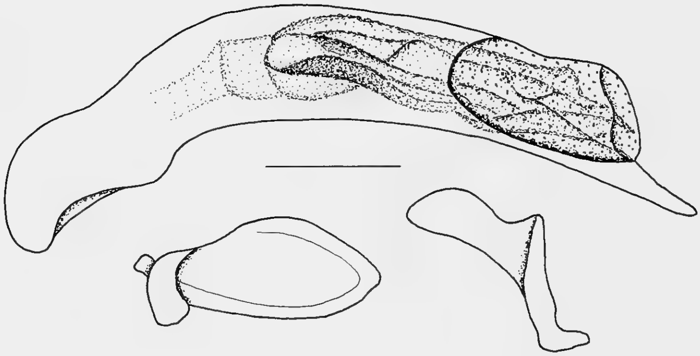


Fig. 20. *Pseudoplatia rossi* (Darlington). Male genitalia: Aedeagus and parameres. Scale: 0.25 mm.

Pronotum. Wide, slightly cordiform, dorsally depressed. Base much wider than apex, apex gently concave, anterior angles slightly produced but evenly rounded. Sides anteriorly evenly rounded, widest about at middle, at position of anterior lateral seta. Lateral margin faintly sinuate in front of basal angles which are slightly obtuse but almost rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, but barely upturned, disk very gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather shallow, oblique, prebasal transverse sulcus shallow. Apical transverse sulcus very shallow, slightly interrupted in middle. Microreticulation absent, punctuation very dense, on disk rather fine and but slightly confluent, on lateral parts coarser and more rugose. Surface glossy, with dense, elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Moderately elongate, rather rectangular, not widened behind middle, dorsally depressed. Humeri rounded, sides almost parallel, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Traces of microreticulation present, intervals coarsely and moderately densely punctate in 2-3 rows, punctures rather regular, barely confluent, about as coarse as punctures of striae. Pilosity rather dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax, and abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect, on abdomen declined. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 20). Rather small in comparison to body size. Genital ring lacking in holotype. Aedeagus rather elongate, lower surface very gently concave, apex elongate, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres fairly elongate, left one with acute apex, much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. Central northern Irian Jaya. Known only from type locality.

Collecting circumstances. Unknown.

New records. None.

Relationships. Closely related to *P. missai*, spec. nov. with which *P. rossi* probably forms the adelphotaxon of *P. latipennis*, spec. nov.

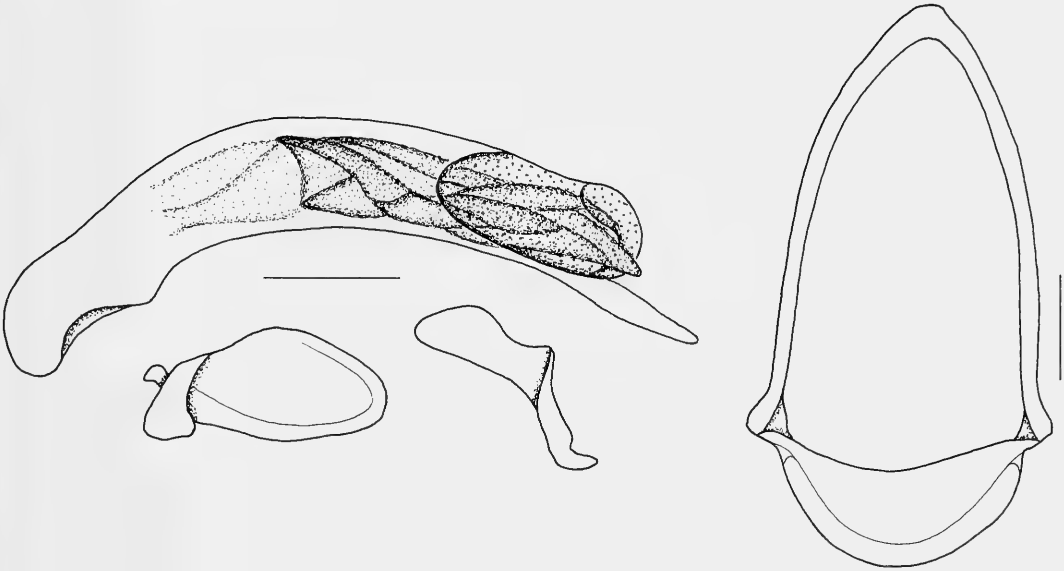


Fig. 21. *Pseudoplatia missai*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

Pseudoplatia missai, spec. nov.

Figs 21, 31, 62

Types. Holotype: ♂, Canopy mission P.N.G. Madang province, Baiteta, FOG M10, 29. VI.1994, Leg. Olivier Missa (IRSNB). – Paratypes: 21♂♂, 21♀♀, same locality and same collector: FOG M1, 22.VI.1993; FOG M4, 22.IV.1993; FOG M6, 18.V.1993; FOG M10, 14.VI.1994; FOG M10, 29.VI.1994; FOG T1, 19.III.1993; FOG T2, 24.VI.1994; FOG T3, 31.III. 1993; FOG T4, 6.IV.1993; FOG T9, 1.VI.1993; FOG T9, 8.VI.1993; FOG T10, 24.III.1994; FOG T11, 20.IV.1994; FOG T12, 8.VI.1994 (CBM, RSNB).

Diagnosis. Characterized, at the same time, by large size, microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from both, *P. latipennis*, spec. nov. and *P. rossi* (Darlington) by narrower prothorax with narrower base; in addition distinguished from *P. latipennis* by laterally less convex elytra and larger light elytral spots; and from *P. rossi* by slightly longer elytra.

Description

Measurements. Length: (6.1)6.5-6.9 mm; width: (2.8)3.1-3.2 mm. Ratios. Width/length of prothorax: 1.66-1.68; width base/apex of prothorax: 1.13-1.18; length/width of elytra: 1.38-1.41; width of elytra/width of prothorax: 1.44-1.50.

Colour (Fig. 62). Upper and lower surfaces dark piceous to almost black, in some specimens neck, clypeus, labrum, the wide lateral margins of pronotum and the narrow margins of elytra dark reddish, pronotum also in middle of apex and base dark reddish. Lower surface usually piceous to almost black. Elytra with a variegate pattern of numerous reddish, more or less elongate spots which form three indistinct, oblique, irregularly v-shaped bands. Distribution of light colour on elytra about as extended as dark colour. Mouth parts, antennae, and legs reddish, femora light reddish.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, not attaining basal angle of pronotum, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons with dense, rather regular, coarse punctuation and with elongate, more or less erect pilosity, posterior part of head with slightly finer punctures. Surface glossy.

Pronotum. Moderately wide, slightly cordiform, though more quadrate than in other species, dorsally depressed. Base much wider than apex, apex gently concave, anterior angles slightly produced but evenly rounded. Sides anteriorly evenly rounded, widest about at middle, at position of anterior lateral seta. Margin more or less distinctly sinuate in front of basal angles which are rather obtuse but almost rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts rather widely explanate, not upturned, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather shallow, oblique, prebasal transverse sukcus barely indicated. Apical transverse sulcus shallow, slightly interrupted in middle. Microreticulation absent, punctuation very dense, on disk moderately fine and rather regular, on lateral parts coarser and somewhat confluent. Surface glossy, with dense, rather elongate, more or less erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Comparatively elongate, rather rectangular, very gently widened behind middle, dorsally rather depressed. Humeri rounded, sides very gently convex, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Traces of microreticulation present, intervals densely and coarsely punctate in about three rows, punctures rather regular, barely confluent, about as coarse as punctures of striae. Pilosity rather dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface fairly glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax, and abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect, on abdomen declined. Metepisternum comparatively short, c.1.5 × as long as wide at apex. Terminal abdominal sternum in both sexes quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 21). Rather small in comparison to body size. Genital ring of moderate size, narrow, almost regularly triangular-convex, with narrow symmetric apex and short and rather wide basis. Aedeagus elongate, lower surface gently concave to near apex, apex elongate, obtuse, feebly upturned. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres fairly elongate, left one much larger than right one.

Female genitalia (Fig. 31). Stylomeres very small. Stylomere 1 asetose at apical rim, stylomere 2 moderately elongate, slightly curved, with moderately elongate, fairly acute apex; with two moderately elongate ventro-lateral ensiform setae, one extremely elongate dorso-median ensiform seta, and a small groove in apical third, but apparently without a nematiform seta. Lateral plate asetose.

Variation. Some variation noted in size and colouration of elytra. One extraordinarily small specimen has less sinuate lateral margins of pronotum than usual, but similar male genitalia.

Distribution. Eastern central Papua New Guinea. Known only from type locality.

Collecting circumstances. Fogged from trunk or lower canopy of standing trees of the species *Dracontomelon dao* and *Pometia pinnata* in lowland rain forest close to the coast.

Etymology. The name honours O. Missa, the collector of this and of a large number of additional carabid species at Baiteta.

Relationships. See under *P. rossi* (Darlington).

Pseudoplatia latipennis, spec. nov.

Figs 22, 63

Types. Holotype: ♂, 16.-18.7.1996, 22, Schüle/Stüben, West Papua, Fakfak, 2 km östl. des Flughafen, Garten in Sek. Wald (CBM).

Diagnosis. Characterized, at the same time, by large size, microreticulate surface of elytra, spotted elytra, and wide, explanate pronotum with distinctly sinuate lateral margins. Distinguished from both *P. rossi* (Darlington) and *P. missai*, spec. nov. by laterally much more convex elytra, smaller light elytral spots, and wider prothorax.

Description

Measurements. Length: 6.7 mm; width: 3.2mm. Ratios. Width/length of prothorax: 1.83; width base/apex of prothorax: 1.20; length/width of elytra: 1.31; width of elytra/width of prothorax: 1.39.

Colour (Fig. 63). Upper surface piceous, but

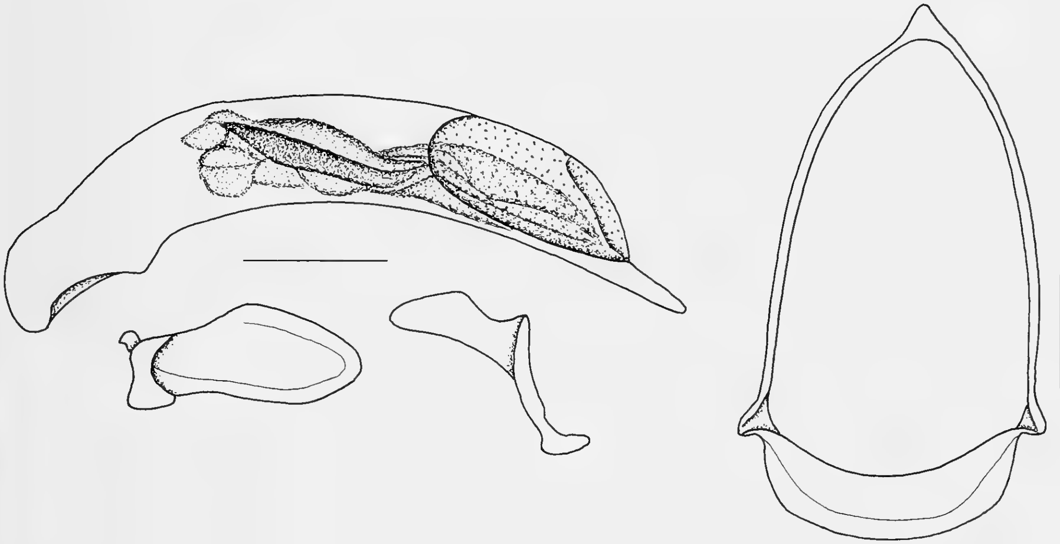


Fig. 22. *Pseudoplatia latipennis*, spec. nov. Male genitalia: Aedeagus, parameres, and genital ring. Scales: 0.25 mm.

neck, clypeus, labrum, and wide lateral margins of pronotum and elytra reddish, pronotum also in middle of apex and base reddish. Lower surface of head and thorax reddish, except for episterna and epimera, of abdomen piceous. Elytra with a variegate pattern of numerous short, yellow, drop-shaped spots which form three indistinct, oblique, irregularly v-shaped bands. Distribution of dark colour on elytra more extended than light colour. Mouth parts, antennae, and legs light reddish, femora yellow.

Head. Wide, though definitely narrower than pronotum. Frons in anterior part irregularly impressed. No longitudinal furrows medially of eyes but the coarse punctuation of frons more or less longitudinally confluent. Eyes large, markedly protruding. Clypeo-frontal suture deep. Anterior margin of clypeus straight. Labrum elongate, apex in middle straight, 6-setose, lateral margins with additional hairs. Mandibles with some longitudinal furrows on upper surface. Apical palpomeres longer than penultimate palpomeres, apices rather acute, both palpi very sparsely pilose. Mentum with unidentate, at apex obtuse tooth. Antenna short, surpassing basal angle of pronotum by one antennomere, median antennomeres about as long as wide, densely pilose from apex of 4th antennomere, basal antennomeres fairly densely setose. Microreticulation absent from frons and clypeus, present and isodiametric on labrum. Clypeus and anterior part of frons with dense, rather regular, moderately coarse punctuation and with fairly elongate, more or less erect pilosity, posterior part of head with slightly finer punctures. Surface glossy.

Pronotum. Wide, slightly cordiform, dorsally depressed. Base much wider than apex, apex gently concave, anterior angles slightly produced but evenly rounded. Sides anteriorly evenly rounded, widest about at middle, at position of anterior lateral seta. Margin distinctly sinuate in front of basal angles which are slightly obtuse but almost rectangular. Posterior marginal seta situated at basal angle. Base in middle gently convex though not pedunculate. Apex in middle not bordered, base bordered throughout. Lateral channel wide, depressed, lateral parts widely explanate, faintly upturned, disk gently raised. Median line well impressed, almost attaining base and apex. Basal grooves rather deep, oblique, prebasal transverse sulcus fairly deep. Apical transverse sulcus shallow, interrupted in middle. Disk on either side with a fairly deep, circular impression. Traces of microreticulation present, punctuation dense, on disk rather fine and more or less regular, on lateral parts coarser and somewhat confluent. Surface glossy, with dense, rather elongate, rather erect, yellow pilosity. Lateral margin with a dense fringe of elongate setae.

Elytra. Comparatively short, rather quadrate though laterally rounded, not widened behind middle, dorsally depressed. Humeri rounded, sides evenly convex, apex oblique, fairly sinuate, sutural angles rounded, elytra slightly dehiscent at suture. Marginal channel narrow throughout. Striae impressed, irregularly and coarsely punctate, intervals slightly convex. Traces of microreticulation present, intervals coarsely and densely punctate in 3-4 rows, punctures fairly regular, barely confluent, about as coarse as punctures of striae. Pilosity dense, yellow, fairly elongate, somewhat declined. Three discal pores situated in 3rd interval, the basal one near 3rd stria, both posterior ones near 2nd stria, though pores and the short erect setae hardly discernible within the dense punctuation and pilosity. Part of marginal setae very elongate. Lateral margin with a dense fringe of elongate setae. Surface fairly glossy. Posterior wings fully developed.

Lower surface. Lower surface of head barely pilose, lower surfaces of prosternum, meso- and metathorax, and abdomen densely punctate and pilose, only proepisterna and -epimera glabrous, pilosity more or less erect, on abdomen more declined. Metepisternum comparatively short, $<1.5\times$ as long as wide at apex. Terminal abdominal sternum in male quadrisetose.

Legs. Of moderate size, plainly pilose, including upper surfaces of tibiae. Claws large, with 3-4 minute denticles. Three basal tarsomeres of male protarsus slightly widened and asymmetrically squamose.

Male genitalia (Fig. 22). Rather small in comparison to body size. Genital ring of moderate size, almost regularly triangular-convex, with narrow symmetric apex and very short and wide basis. Aedeagus elongate, lower surface evenly concave, apex elongate, obtuse. Orificium very large, almost completely situated on left side. Internal sac rather simply folded, without any sclerotized parts and also without a denticulate plate within orificium. Both parameres elongate, left one much larger than right one.

Female genitalia. Unknown.

Variation. Unknown.

Distribution. Western Irian Jaya. Known only from type locality.

Collecting circumstances. Taken from low vegetation in secondary forest.

Etymology. The name refers to the wide pronotum of this species.

Relationships. Probably the adelphotaxon of *P. rossi* (Darlington) and *P. missai*, spec. nov.

Genus *Agonocheila* Chaudoir

Chaudoir, 1848: 119; 1869: 223; Csiki 1932: 1379; Darlington 1968: 118; Moore et al. 1987: 288; Lorenz 1998: 434.

Type species: *Agonocheila guttata* Chaudoir, 1848 (by monotypy).

Diagnosis. Genus of Lebiinae, very heterogenous in shape and structure. In the restricted sense as designated in the present paper, *Agonocheila* is mainly characterized by the following character states: depressed body; more or less wide, depressed, and mostly distinctly cordiform pronotum; depressed, moderately ovate, but not quadrate elytra; presence of rather short, usually depressed pilosity on head, pronotum, and elytra; absence of a dense fringe of elongate setae on the margins of pronotum and elytra; sparsely pilose or impilose upper surface of tibiae; quadrisetose male and female terminal abdominal sternites; absence of a notch near apex of middle tibia in males; usually rather simple elytral pattern, bimaculate or quadrimaculate or with moderately variegate patches.

Examination of the male genitalia of half a dozen species from different species-groups within Agonocheila revealed quite differently shaped and structured aedeagi which diversity at present renders it impossible to draw any final conclusions about the extra- and intrageneric relationships.

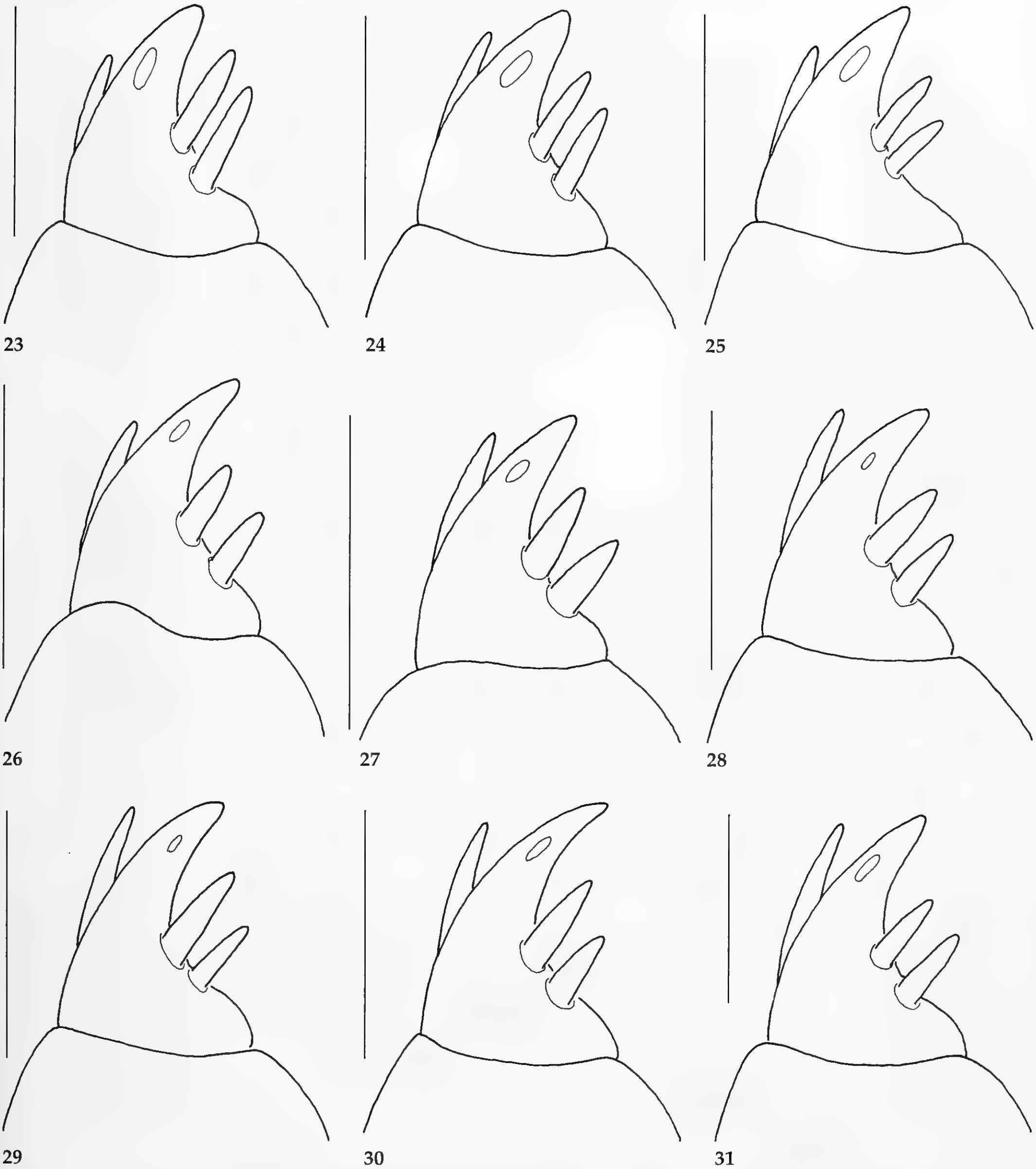
Distribution. The whole of Australia including Tasmania; introduced by man into New Zealand. At the present state of knowledge, not in New Guinea.

Relationships. This genus (or group of genera), together with *Minuthodes*, *Cheilagona*, and *Pseudoplatia*, forms a group of closely related genera though within this group *Agonocheila* probably is next related to *Minuthodes* and *Cheilagona*. However, a systematic examination of the male and female genitalia of the Australian species is needed to corroborate this opinion.

Note. This diagnosis is based on the examination of the type species of *Agonocheila*, *A. guttata* Chaudoir, and has been verified by the examination of 23 described and about 30 additional undeterminated Australian species. A thorough revision of the numerous existing Australian species probably will reveal a number of well characterized species-groups or subgenera, or even additional genera. At present, this is without the scope of this paper.

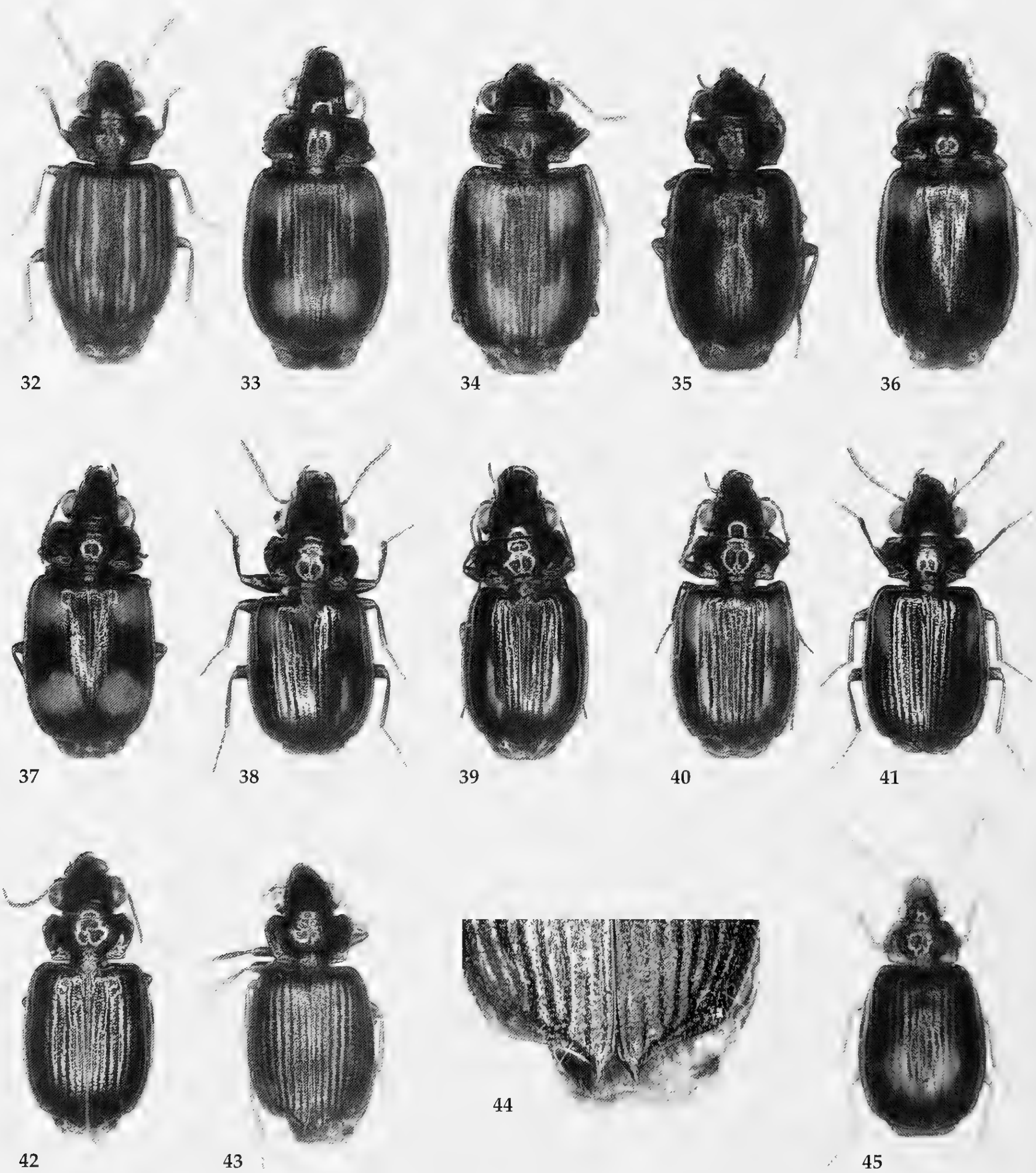
Phylogenetic relations

At present, and without a thorough taxonomic revision of the large number of Australian *Agonocheila* species, any considerations about the phylogenetic relations of the genera mentioned herein is difficult and also premature. This applies in particular, because the adelphotaxon of the whole complex is so far unknown, although the Australian genus *Philophloeus* Chaudoir may represent it. The question becomes even more difficult, because the numerous

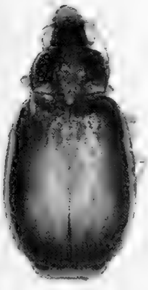


Figs 23-31. Female stylomeres. **23.** *Minuthodes sexualis* (Darlington). **24.** *M. rectimargo*, spec. nov. **25.** *M. atrata*, spec. nov. **26.** *Cheilagona variabilis* (Darlington). **27.** *C. nigropicea*, spec. nov. **28.** *Pseudoplatia minuthoides* (Darlington). **29.** *P. drumonti*, spec. nov. **30.** *P. riedeli*, spec. nov. **31.** *P. missai*, spec. nov. Scales: 0.1 mm.

Australian species of *Philophloeus* and *Agonocheila* are corticolous or subcorticolous animals living mainly on the trunks of standing trees in open, commonly eucalpyt forest, whereas the extra-Australian species of *Minuthodes, Cheilagona* and *Pseudoplatia* apparently are rain forest dwelling species that are said to live on the bark and in moss of fallen logs, but perhaps also more or less up on the trunks and even in the canopy of standing rain forest trees. Of a number of species of these genera, however, not even any collecting circumstances are recorded. Those Australian species of *Cheilagona* known to me, likewise live in rain forest, while some Australian *Minuthodes* occur in open eucalypt forest under bark.



Figs. 32-63. Habitus. **32.** *Minuthodes papuana* (Sloane) (5.1 mm). **33.** *M. regularis* Darlington (4.9 mm). **34.** *M. irregularis* Darlington (5.5 mm). **35.** *M. metallica* Darlington (5.0 mm). **36.** *M. biplagiata* Baehr (5.2 mm). **37.** *M. multisetosa* Baehr (5.3 mm). **38.** *M. sexualis* Darlington (Mapia) (5.8 mm). **39.** *M. sexualis* Darlington (w. Timika) (5.3 mm). **40.** *M. rectimargo*, spec. nov. (Pusppensaat) (4.8 mm). **41.** *M. rectimargo*, spec. nov. (Aseki) (4.7 mm). **42.** *M. atrata*, spec. nov. (4.4 mm). **43.** *M. nigra* (van Emden) (5.5 mm). **44.** *M. nigra* (van Emden), apex of elytra. **45.** *Cheilagona gressitti gressitti* (Darlington) (4.4 mm). **46.** *C. gressitti planata*, subspec. nov. (4.1 mm). **47.** *C. variabilis* (Darlington) (4.5 mm). **48.** *C. rufa* (Darlington) (4.8 mm). **49.** *C. nigropicea*, spec. nov. (4.9 mm). **50.** *P. expansa* (Darlington) (5.5 mm). **51.** *P. dorsata dorsata* (Darlington) (6.2 mm). **52.** *P. dorsata minor*, subspec. nov. (5.4 mm). **53.** *Pseudoplatia minuthoides* (Darlington) (4.2 mm). **54.** *P. sedlacekorum* (Darlington) (4.7 mm). **55.** *P. drumonti*, spec. nov. (4.8 mm). **56.** *P. riedeli*, spec. nov. (5.3 mm). **57.** *P. gerdi*, spec. nov. (5.0 mm). **58.** *P. recticollis*, spec. nov. (5.4 mm). **59.** *P. georgei*, spec. nov. (5.6 mm). **60.** *P. subnitens* (Darlington) (5.75 mm). **61.** *P. rossi* (Darlington) (6.6 mm). **62.** *P. missai*, spec. nov. (6.7 mm). **63.** *P. latipennis*, spec. nov. (6.7 mm).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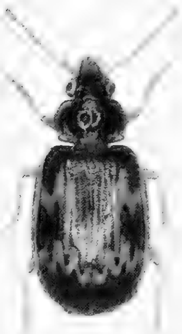
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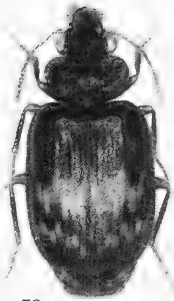
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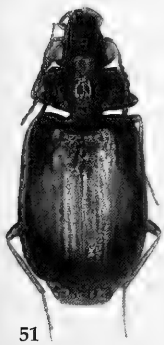
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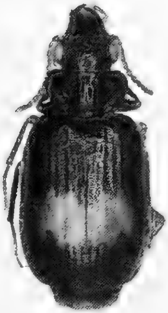
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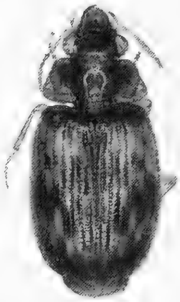
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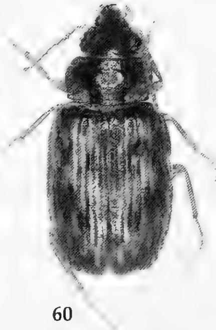
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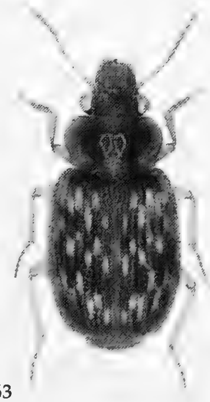
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The question arises, then, which habits is primary and which secondary.

Genus *Minuthodes.* Although this genus is rather homogeneous in body shape as well as in structure of male and female genitalia, in colouration as well as in microstructure of the surface it is quite diverse. Due to its spined elytra, *M. nigra* certainly is a highly evolved species, as is the *sexualis*-complex to which also *M. brachydera* Chaudoir from the Moluccas belongs, in view of the dentate femur of their females. If presence of elytral pattern is thought to be a basic character state, which is quite probable because all related genera likewise bear patterned elytra, the uniformly black or bluish colouration of *M. atrata, M. brachydera, M. simplex, M. metallica,* and *M. nigra* also should represent evolved character states. Some other character states likewise might be regarded apomorphic, e.g. reduction or complete absence of pilosity of surface, multiplication of tactile setae on pronotum and elytra, and development of a complex elytral pattern. If all these suggestions prove right, then species like *M. regularis* Darlington and *M. irregularis* Darlington should represent the basic stock of the whole genus.

This would mean, in other words, that the genus *Minuthodes* has its most basic species in New Guinea, whereas species being apomorphic in one or another way mostly occur at the margins of the genus' range, i.e. on the Moluccas, in northern Australia, on Solomon Islands, but also in New Guinea, although in the latter area they mainly occur in the extreme west or east, respectively. The genus *Minuthodes*, in its restricted sense, thus seems to have originated in New Guinea, and apparently certain stocks later spread to the west, east and south, where, in particular in the drier parts of Australia, several species finally changed their habits through adapting themselves to the life under bark of eucalypts in open sclerophyll forest or woodland.

Genus *Cheilagona.* This genus is very homogenous in body shape and markedly differs in this respect from all related genera. It is rather heterogenous, however, in elytral colour and pattern, as well as in shape and structure of the male aedeagus though not in shape of the male genital ring. Because male genitalia are not known from all species and not even from all taxa occurring in New Guinea, the relationships within the genus are not yet fully settled, but probably the male genitalia of *C. g. gressitti* are less evolved than those of *C. variabilis* and *C. rufa.* The absence of any elytral pattern in both New Guinean *C. rufa* and *C. nigropicea* likewise is an derived character state, because presence of elytral pattern most probably is a basic character in all related genera. Unfortunately, the Australian species of the genus have not been examined for their male genitalia, so their relationships are not yet settled and, as a consequence, suggestions about the biogeographic history of the genus are not possible now, apart from the statement, that uniformly coloured, unpatterned species have not yet been recorded from Australia.

Genus *Pseudoplatia.* Certainly *P. minuthoides* in certain characters of external and genitalic morphology is most plesiomorphic within the whole genus. As this species already possesses the elytral pattern composed of many elongate spots, the aberrant patterns of *P. dorsata* and *P. expansa* may be apomorphic in comparison with the spotted elytral pattern of the other species. All other species, however, are extremely similar with respect to shape, structure of surface, colour pattern, and even morphology of male and female genitalia, and thus, they presumably are very closely related and may have differentiated quite recently.

Such large number of closely related taxa is characteristic for New Guinea the fauna of which island is comparatively young but has achieved a surprisingly great taxonomic diversity that probably is due to the rugged montane landscape, remarkable orogenic events in rather recent times, and the composition of this island from a number of previously separated terranes of different origins.

None of the mentioned genera has any species in the Oriental Region proper, if the occurrence of two species of *Minuthodes* on Sulawesi and the Moluccas is regarded due to their quite recent immigration from the Papuan Subregion. For *Minuthodes* and *Pseudoplatia*, at least, the Papuan subregion seems to represent the centre of distribution, whereas *Cheilagona* is also represented in northern Australia but without our knowing, how many Australian species actually belong to that genus and where the original stock of this genus may have originated. Although a few *Minuthodes* species exist in Australia, New Guinea bears the highest species diversity and also the presumptive most basal species of the whole genus.

Most probably the whole complex originated from rain forest living species and all adaptations to life on and under bark in drier environments then would be secondary. But this does not answer the question in which region this complex originated which could be solved only by a complete cladistic survey of the whole complex of pericaline Lebiinae or at least of those that range through the Oriental and Australian regions.

Acknowledgements

For loan of types and material I am very grateful to following curators and collectors: Mr. M. Brendell (London), Dr. T. Deuve (Paris), Mr. A. Drumont (Bruxelles), Mr. B. Jäger (Berlin), Dr. D. H. Kavanaugh (San Francisco), Dr. I. Löbl (Génève), Dr. O. Merkl (Budapest), Dr. G. B. Monteith (Brisbane), Dr. P. D. Perkins (Cambridge/Mass.), Dr. A. Riedel (Karlsruhe), Dr. G. A. Samuelson (Honolulu), Mrs. C. Taylor (London), Dr. M. Uhlig (Berlin), M. T. Weir (Canberra), Dr. L. Zerche (Münchberg).

Checklist of the New Guinean species of the genera *Minuthodes* Andrewes, *Cheilagona*, gen. nov., and *Pseudoplatia*, gen. nov. (PNG: Papua New Guinea, IJ: Province of Papua, former Irian Jaya)

Genus *Minuthodes* Andrewes	
atrata, spec. nov.	e. PNG
biplagiata Baehr	w. IJ
irregularis Darlington	ne IJ
metallica Darlington	e. PNG
multisetosa Baehr	w. IJ
nigra (Van Emden)	Solomon Islands: Tulaghi Is.
papuana (Sloane)	whole New Guinea, New Britain
rectimargo, spec. nov.	whole New Guinea
regularis Darlington	whole New Guinea
sexualis Darlington	whole New Guinea
simplex Darlington	e. PNG: Goodenough Is.
Genus *Cheilagona*, gen. nov.	
gressitti gressitti (Darlington)	whole New Guinea
gressitti planata, subspec. nov.	ce. IJ
nigropicea, spec. nov.	w. IJ
rufa (Darlington)	e. PNG
variabilis (Darlington)	whole New Guinea
Genus *Pseudoplatia*, gen. nov.	
dorsata dorsata (Darlington)	PNG, ce. IJ
dorsata minor, subspec. nov.	ce. PNG
drumonti, spec. nov.	ce. PNG
expansa (Darlingon)	PNG, ce. IJ
georgei, spec. nov.	e. IJ
gerdi, spec. nov.	w. IJ
latipennis, spec. nov.	w. IJ
minuthoides (Darlington)	ce. PNG
missai, spec. nov.	ce. PNG
recticollis, spec. nov.	n. PNG
riedeli, spec. nov.	w. IJ
rossi (Darlington)	n. IJ
sedlacekorum (Darlington)	ce. PNG
subnitens (Darlington)	n. IJ: Japen Is.

References

Andrewes, H. E. 1939. Papers on Oriental Carabidae. XXXV. On the types of some Indian genera. – Ann. Mag. Nat Hist. (11) **3**: 128-139

-- 1941. Papers on the Oriental Carabidae XXXVII. – Ann. Mag. Nat. Hist. (11) **7**: 307-317

Baehr, M. 1990. A review of the Australian species of *Minuthodes* Andrewes, with the description of two new species (Coleoptera, Carabidae, Lebiinae). – Spixiana **13**: 33-41

-- 1994. A new species of *Minuthodes* Andrewes from Australia (Insecta, Coleoptera, Carabidae, Lebiinae). – Spixiana **17**: 37-41

-- 1998. Two new species of *Minuthodes* Andrewes from New Guinea (Insecta, Coleoptera, Carabidae, Lebiinae). – Spixiana **21**: 235-240

-- 2001. A new species of the genus *Minuthodes* Andrewes from north Queensland, Australia (Insecta, Coleoptera, Carabidae, Lebiinae). – Spixiana **24**: 171-175

-- 2004. The genus *Lebia* Latreille in the Australian-Papuan Region (Insecta, Coleoptera, Carabidae, Lebiinae). – Spixiana **27**: 205-246

Chaudoir, M. de. 1848. Mémoire sur la famille des Carabiques. 1e partie. – Bull. Soc. Imp. Nat. Moscou 21: 3-134 119

-- 1869. Mémoir sur les Thyréopérides. – Ann. Soc. ent. Belg. 12: 113-162

Csiki, E. 1932. Coleopterorum Catalogus. Vol. III. Carabidae III: Pars 124, Harpalinae VII: 1279-1598. – W. Junk, Berlin

Darlington, P. J. Jr. 1968. The Carabid beetles of New Guinea. Part III. Harpalinae continued. Perigonini to Pseudomorphini. – Bull. Mus. Comp. Zool. **139**: 1-253

Emden, F. van 1937. Einige Carabidae von den Salomo- und Sta.-Cruz-Inseln, den Neuen Hebriden sowie Neu-Guinea. – Stett. Ent. Z. **98**: 34-45

Lorenz, W. 1998. Systematic List of extant Ground Beetles of the World (Insecta Coleoptera "Geadephaga": Trachypachidae and Carabidae incl. Paussinae, Cicindelinae. Rhysodidae). – Tutzing, printed by the author. 502 pp.

Moore, B. P., T. A. Weir & J. E. Pyke 1987. Rhysodidae and Carabidae. In: Zoological Catalogue of Australia, **4**: 17-320. – Australian Government Publishing Service, Canberra

Sloane, T. G. 1917. Carabidae from tropical Australia (New genera and species, notes and synonymy, and synoptic tables. Tribes Scaritini, Harpalini, Odacanthini, Lebiini, and Helluonini). – Proc. Linn. Soc. New South Wales 42: 406-438

9. Daccordi, M. & P. M. Giachino (eds.): Results of the Zoological Missions to Australia of the Regional Museum of Natural Sciences of Turin, Italy. II. – Monografie XLII. Museo Regionale di Scienze Naturali, Torino, 2005. 643 pp., numerous figs. ISBN 88-86041-63-2.

The second volume of the series of results of the recent travels of a number of Italian entomologists to Australia again includes a number of descriptions of species, and some revisions of smaller or larger supraspecific taxa. According to the fields of activity of the authors, this second volume again covers mainly papers on a few families of Coleoptera with a single paper referring to Hymenoptera. And within Coleoptera almost exclusively papers on Carabidae, Staphylinidae, and Chrysomelidae are included, with one additional revisional paper on a genus of Hydrophilidae. Even when covering almost 650 printed pages, the volume includes mainly papers on rather small taxa, in terms of numbers of included species. This clearly demonstrates the extremely inadequate knowledge that we possess about the Australian entomofauna, at least as Coleoptera and Hymenoptera are concerned.

Although some of the papers include many descriptions of new genera and species, I guess most important those papers that try a complete revision of the mentioned supraspecific taxon, rather than those which only describe new species without inserting these in the framework of the whole genus or tribe. Accordingly the revisions of the Australian Anillina (Carabidae), of the genus *Laccobius* (Hydrophilidae), and both papers on Staphylinidae would be of major importance, while the type revisions of a small number of species of the carabid genus *Carenum* which should serve as the first part of a general revision of this very large genus, and the not only taxonomic but also biogeographic study about the Australian *Bembidion* (Carabidae) differ from the other papers in some respects and are also very interesting.

Unfortunately, here and there it becomes evident that the volume has been prepared very rapidly, probably too rapidly. Some authors probably did not take enough time to include in their papers the ample material present in the various Australian museums, hence their treatments are not complete in view of distribution of species, probably also in view of taxonomy. In certain papers also a linguistic revision by a native English speaker would have well improved the written text. The reason for these shortcomings may have been the pressure of the authors by the fund-giving authorities to produce results of their expeditions very soon, but this was not beneficial to the volume.

Altogether the volume combines a comparatively small but very interesting amount of information about an entomofauna which is badly in need of much more revisionary work. But the multitude of new taxa collected by the authors during the last few years also demonstrate the great importance of additional and, in particular, systematic exploring and collecting work in Australia to gain a more reliable or even complete knowledge of the unique arthropod fauna of this continent.

M. Baehr

10. Ebert, G. (Hrsg.): Die Schmetterlinge Baden-Württembergs, Bd. 10, Ergänzungsband. – Ulmer-Verlag, Stuttgart, 2005. 426 S., 83 Farbfotos, 46 SW-Fotos, 7 Verbreitungskarten, 6 Graphiken, hardback. ISBN 3-8001-4383-6.

Es ist vollbracht! Der zehnte und letzte Band der Buchreihe "Die Schmetterlinge Baden-Württembergs" ist erschienen! Welch Ausnahmeleistung, zu der man dem Herausgeber Günter Ebert und seinem überaus kompetenten, breit gefächerten Autorenteam nur gratulieren kann! Vollkommen zu Recht wurde G. Ebert für dieses Standardwerk, das international kein Pendant auf vergleichbarem Niveau findet, in den letzten Jahren vielfach geehrt und ausgezeichnet.

Auf den ersten 92 Seiten werden Korrekturen und Ergänzungen zu den anderen 9 Bänden vorgestellt, wobei eine Reihe von besonders interessanten Themen, z.B. die Faunendynamik bestimmter Arten, in separaten Kapiteln behandelt wird. Daran schließt sich eine Erörterung darüber an, wie die Ergebnisse des Grundlagenwerkes Schmetterlinge im Artenschutzprogramm Baden-Württemberg umgesetzt wird und weiter umgesetzt werden kann. Auf den nächsten 30 Seiten folgt eine Darstellung der Bestandssituation und der Gefährdung der Großschmetterlinge Baden-Württembergs. Höchst interessant ist auch die Zusammenstellung der Geschichte der lepidopterologisch-faunistischen Forschung in diesem Bundesland. Das Buch wird mit einem kurzen Nachwort und einer Unterschrift des Herausgebers (S. 195-196) abgeschlossen.

So weit so gut, möchte man meinen. – Weit gefehlt! Im Anhang bekommt der Leser noch einige 'Leckerbissen' nachgeliefert, z.B. auf über 70 Seiten eine komplette Liste mit typischen Lebensräumen für alle in Baden-Württemberg nachgewiesenen Großschmetterlinge, eine fast 100seitige Liste von Nahrungspflanzen und den auf ihnen nachgewiesenen Faltern (Blütenbesuch) und Raupen (Futterpflanze). Das umfangreiche Sach- und Schlagwortverzeichnis zu den Bänden 1-10 (57 Seiten) schließt das Buch nun endgültig ab.

Das Buch ist viel mehr als nur ein kleiner Ergänzungs- und Korrekturband, dessen Kauf man sich auch sparen kann (was angesichts des geringen Preises jedoch nicht viel Ersparnis bringen würde). Vor allem die beiden überaus umfangreichen Tabellen des Anhanges sind für die Arbeit mit Schmetterlingen in Mitteleuropa eine unverzichtbare Informationsquelle.

A. Hausmann

SPIXIANA	29	2	147–152	München, 01. Juli 2006	ISSN 0341-8391

Hisonotus candombe, a new species from the río Uruguay basin in the República Oriental del Uruguay

(Siluriformes, Loricariidae, Otothyrini)

Jorge R. Casciotta, M. de las Mercedes Azpelicueta, Adriana E. Almirón & Thomas Litz

Casciotta, J., M. de las M. Azpelicueta, A. Almirón & T. Litz (2006): *Hisonotus candombe*, a new species from the río Uruguay basin in the República Oriental del Uruguay (Siluriformes, Loricariidae, Otothyrini). – Spixiana **29/2:** 147-152

Hisonotus candombe, spec. nov. is described from arroyos Palomas and Catalán Grande, río Uruguay basin, in the República Oriental del Uruguay. *Hisonotus candombe* is distinguished by the following combination of characters: presence of heavy serrae along complete posterior pectoral spine margin, presence of narrow odontodes free area along anterior margin of snout, 5 anal-fin branched rays, lateral line canal incomplete and discontinuous with an anterior field bearing 2-7 pores and posterior field with 8-19 pores.

Dr. Jorge R. Casciotta (investigador CIC), Dra. M. de las Mercedes Azpelicueta, Dra. Adriana E. Almirón; División Zoología Vertebrados, Museo de La Plata, Paseo del Bosque, 1900 La Plata, Argentina; e-mail: jrcas@museo.fcnym.unlp.edu.ar

Dr. Thomas Litz, Krumpfhalde 47, D-88448 Attenweiler, Germany; e-mail: TCLitz@aol.com

Introduction

Since the original description of *Hisonotus* by Eigenmann & Eigenmann (1889), many species of this genus have been considered as species of the genera *Otocinclus* or *Microlepidogaster*. Subsequently, Schaefer (1998) redefined the genus *Hisonotus* based on the absence of plates anterior to nostrils and the presence of rostral plates with large odontodes and proposed the inclusion of several species of *Microlepidogaster* and *Otocinclus* within the genus *Hisonotus*.

In southern South America, about 13 species of the genus were found in the rivers Paraguay, Paraná, Uruguay, and Río de la Plata, and Los Patos System. Only two of them are present in the Uruguay river basin, *H.* ringueleti Aquino et al., 2001 and *H. maculipinnis* (Regan, 1912).

The objective of the present contribution is the description of a new species of *Hisonotus* from the río Uruguay basin in the República Oriental del Uruguay.

Methods

Specimens were cleared and counterstained following Taylor & Van Dyke (1985). Measurements were taken as straight line distances using digital callipers following Boeseman (1968). Counts include holotype and 11 paratypes; values of the holotype are indicated by an asterisk. Vertebrae count includes those ones corresponding to the Weberian apparatus and the caudal centrum (CU1+PU1) as one element. Institutional abbreviations are as listed in Leviton et al. (1985) with the addition of Asociación Ictiológica, La Plata, Argentina (AI) and Facultad de Ciencias, Universidad de la República, Montevideo, República Oriental del Uruguay (ZVC-P).

Hisonotus candombe, spec. nov.
Figs 1-3, Tab. 1

Types. Holotype: ZVC-P 5595, 29.9 mm SL, República Oriental del Uruguay, Departamento Salto, río Uruguay basin, arroyo Palomas (31°04'43"S–57°37'26W), coll: P. Laurino et al., 17 March 2003. - Paratypes: ZSM 32062,

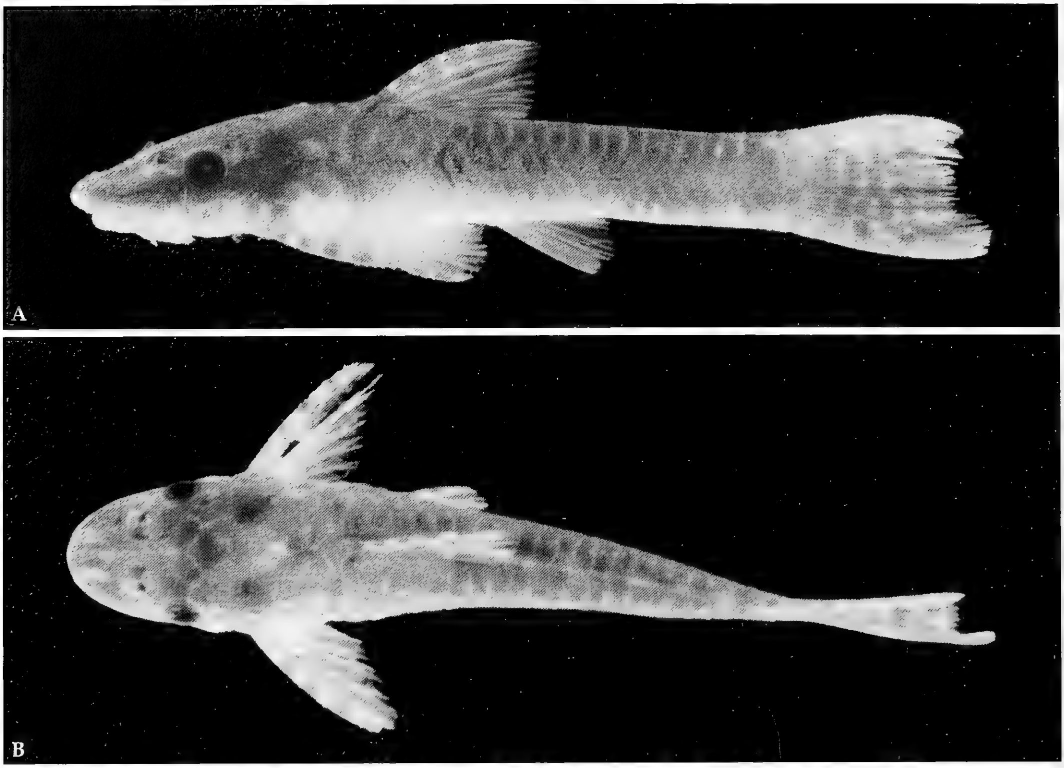

Fig. 1. *Hisonotus candombe,* spec. nov. Holotype, 29.9 mm SL, República Oriental del Uruguay, Departamento Salto, río Uruguay basin, arroyo Palomas. **A.** lateral view. **B.** dorsal view.

3 ex., 23.4-27.4 mm SL, same collecting data as holotype. AI 164, 1 ex., 27.2 mm SL, same collecting data as holotype. MHNG 2662.86, 2 ex. 26.0-26.3 mm SL, same collecting data as holotype. AI 187, 4 ex., 22.8-30.0 mm SL, República Oriental del Uruguay, Departamento Artigas, río Uruguay basin, arroyo Catalán Grande (30°50'35"S – 56°14'30"W), coll: P. Laurino et al., 16 August, 2002.

Diagnosis. *Hisonotus candombe*, spec. nov. is diagnosed by the following combination of characters: presence of heavy serrae along complete posterior pectoral spine margin, presence of narrow odontode free area along anterior margin of snout, 5 anal-fin branched rays, lateral line canal incomplete and discontinuous with an anterior field bearing 2-7 pores and posterior field with 8-19 pores.

Description

Morphometrics of holotype and 11 paratypes are presented in Tab. 1. Body slightly elongate, head depressed (Fig. 1A). Greatest body depth at dorsal fin origin. Dorsal profile of head from snout tip to orbital level slightly concave, straight over supraoccipital. Snout tip rounded in dorsal view (Fig. 1B). Rostral median plate with notch. Naked area anterior to anterior nares. Head slightly wider than trunk. Eyes placed dorsolaterally, horizontal eye diameter longer than suborbital depth and as large as nare diameter. Iris diverticulum present, about one third of pupil diameter. Three infraorbitals surrounding orbit, fourth infraorbital expanded ventrally. Margins and surface of lips covered with papillae. Maxillary barbels short. Jaw teeth bifid; teeth slender with their major cusp slightly expanded and rounded tip, and a minor cusp pointed. Absence of accessory teeth on premaxilla and dentary. One series of teeth, 6-15 (mode 12) on premaxilla and 6-13 (mode 8) on dentary. Pterotic-supracleithrum bearing openings. The preopercular sensory canals directed toward pterotic-supracleithrum.

Body covered by dermal plates except some areas on ventral region. Abdominal area with two series of lateral plates and some ones distributed in middle region. Lateral and anterior rostral plates reflected ventrally. Five lateral series of plates on trunk. Plates of dorsal series continuous; mid-dorsal series continuous and incomplete; median series discontinuous and complete with 22-24 (mode 23*); mid-ventral series complete and continuous; ventral series continuous and incomplete. Lateral line discontinuous with one gap, anterior field with 2-7 (3*, mode 6), and posterior field with 8-19 (12*,mode 15) pores. First lateral line plate small, second one placed on rib of sixth vertebra. Anal fin preceded by 3 or 4 pairs of ventral plates and one unpair plate. Coracoid and cleithrum exposed ventrally, excluded arrector fossae area. Two pairs and one unpaired predorsal plates.

Odontodes covering head, trunk, and fin rays. Head and trunk odontodes uniformely distributed. Odontodes usually small on body and pelvic spines, large ones on pectoral spine. A tuft of large odontodes at posterior supraoccipital tip. Large odontodes along anterior margin of snout biserially arranged, dorsad and ventrad series separated by a naked area.

Dorsal fin with one spine and 7* (one specimen with 8) branched rays, its origin placed posterior to vertical through pelvic-fin origin. Dorsal fin moved posteriorly behind seventh vertebra. First dorsal-fin proximal radial articulated with eighth vertebra. Adipose fin absent. Pectoral fin with one spine bearing heavy serrae along its posterior margin (Fig. 2), and 5 to 6 branched rays (10* ex. with 5; 2 ex. with 6); distal tip of pectoral fin surpassing more than 50 % of pelvic-fin length. Pectoral-fin axillary slit present. Pelvic fin with one spine and 5 branched rays, surpassing scarcely anal-fin origin in males. Presence of small fleshy flap on pelvic fin in males. Anal fin with one spine and 5 branched rays. Caudal fin with fourteen branched rays.

Color in alcohol: Ground color of dorsum and flanks of body pale brown, ventral surface of head and trunk whitish. Narrow light stripe from snout tip to eye and from eye to lateral tip of postemporo-supracleithrum. Dorsum of body, upper third of flanks, and head light, with reddish brown dots. A light area on each flank, extending from supraoccipital margin to middle caudal peduncle. Dorsum between last dorsal-fin ray insertion and base of caudal-fin rays with a narrow whitish line. Head with three whitish dots, one on tuft and remaining ones on lateral posterior tip of postemporo-supracleithrum. Also, a light dot on first dorsal spine. Preopercle, opercle, and cleithrum whitish.

Pectoral, pelvic, anal, and dorsal fins whitish, with dots forming series of darker bands, somewhat diffuse on pelvic fin. Caudal fin pale brown with about 4 or 5 dark vertical stripes; light areas on 4 or 5 uppermost and 2 lowermost caudal-fin rays.

Color in life: ground color of dorsum and flanks bright green, ventral surface of head and trunk pale yellowish. Narrow light stripes from snout tip to eye and from eye to lateral tip of postemporo-supracleithrum. Dorsum of body, upper third of flanks, and head light, with dark reddish brown dots. Pectoral-fin spine and externalmost caudal-fin rays stripped with brown and whitish bands. Caudal fin brown with about 4 or 5 dark vertical stripes; translucent areas on upper and lower caudal-fin lobes.

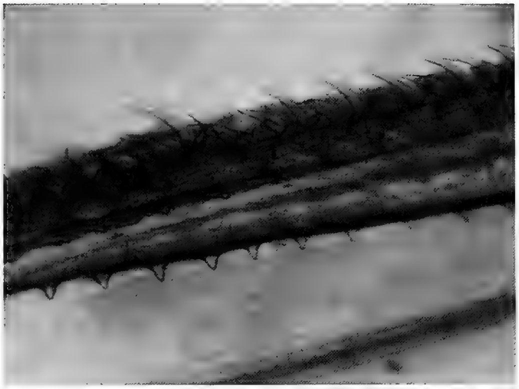

Fig. 2. *Hisonotus candombe,* spec. nov. Pectoral spine showing the serrae on the posterior margin of the spine (×50).

Sexual dimorphism. Pelvic-fin spines of males longer than that of females (18.3-21.7 vs. 16.4-18.0 % SL; 7 females and 5 males). Distal tip of pelvic fins surpassing anal-fin origin in males. Males with flap

Tab. 1. Morphometric data of the holotype and 11 paratypes of *Hisonotus candombe*. H. holotype.

	H	Range	Mean	SD
Standard length (mm)	29.9	22.8-30.0		
Percents of SL				
Predorsal distance	43.5	42.7-48.2	45.3	1.71
Head length	34.8	34.8-38.2	36.8	1.15
Cleithral width	22.1	21.9-24.7	22.9	0.84
Dorsal-fin spine length	23.7	23.7-28.1	26.2	1.61
Trunk length	15.7	15.0-18.7	16.8	1.19
Pectoral-fin spine length	24.1	24.1-29.3	26.5	1.77
Pelvic-fin spine length	16.4	16.4-21.7	18.1	1.50
Abdominal length	20.1	19.5-23.5	21.3	1.29
Caudal peduncle length	33.4	29.3-34.0	31.9	1.50
Caudal peduncle depth	13.0	13.0-14.9	13.9	0.65
Head depth	16.4	16.4-19.7	17.7	1.06
Snout length	16.7	16.7-18.9	17.8	0.71
Horizontal eye diameter	5.7	5.4- 7.0	6.4	0.48
Interorbital width	13.4	12.5-14.8	13.8	0.68
Percents of HL				
Head depth	47.1	43.7-54.2	48.3	2.90
Snout length	48.1	45.0-51.8	48.3	1.94
Horizontal eye diameter	16.3	15.0-19.3	17.4	1.18
Interorbital width	38.5	34.0-41.1	37.4	1.83
Cleithral width	63.5	60.6-64.8	62.1	1.39

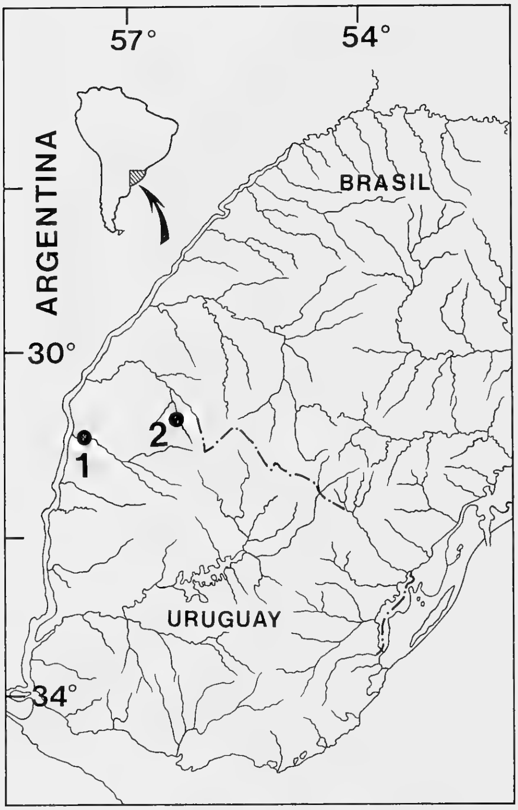

Fig. 3. *Hisonotus candombe* spec. nov.; localities: 1: arroyo Palomas (type locality), 2: arroyo Catalán Grande; río Uruguay basin, República Oriental del Uruguay.

on first branched ray of pelvic fin. Abdominal region of males naked, females with few plates on midline. Genital papilla of males longer, slender and more acute than that of females. Preanal region without median plates in males.

Etymology. The specific epithet *candombe* is a spanish word that refers to the African derived rhythm that was popularized in the nineteenth century by black slaves in the República Oriental del Uruguay.

Distribution and habitat. This species is known from the arroyos Palomas, Departamento Salto, and Catalán Grande, Departamento Artigas, both streams belong to the río Uruguay basin (Fig. 3). The type locality is a small, shallow creek with muddy soil and clear, slow-flowing water (Fig. 4). *Hisonotus candombe* was only collected inbetween aquatic plants as *Ludwigia* sp. and *Potamogeton* sp., and on leaves of terrestrial plants hanging into the water. Near the place where specimens were collected other creeks have rocky bottom, loose stones and rapid current water. Moderate amounts of grass and other vegetation were present in the margins. The arroyo Catalán Grande is a creek with regions of rapid and slow flowing water, with loose stones, and gravel at the bottom; dense vegetation is present in the margins. *Hisonotus candombe* was collected here within *Echinodorus uruguayensis*, densely growing on some places.

The environmental variables in the arroyo Catalán Grande were: air temperature 18-20 °C; water temperature 11.5-17 °C; pH 7.2; conductivity 160-200 µS/cm. In the arroyo Palomas, the same variables measured were: air temperature 24 °C; water temperature 24 °C; pH 7.7; conductivity 300 µS/cm.

Behaviour in aquarium. *Hisonotus candombe* is reported to behave just as most Hypoptopomatinae species wich have been known in aquaria for many years. It is a peacefull species that usually hangs on *Echinodorus* sp., *Sagittaria* sp., or similar aquarium plants. The bright green color of the body vanished after about a half year changing to greyish brown.

Remarks. Six species of *Hisonotus* have been described from the southern area of the Río de La Plata basin and Lagoa dos Patos system, *H. laevior*, *H. leptochilus*, *H. nigricauda*, *H. maculipinnis*, *H. ringueleti*, and *H. taimensis*.

Hisonotus candombe is differentiated from all those species, excluded *H. ringueleti*, in having an odontode free area along the anterior margin of the snout. Also, *H. candombe* differs from *H. taimensis*, *H. leptochilus*, and *H. laevior* by the lower number of lateral plates (22-24 vs. 26-31 in *H. taimensis* and 28 plates in *H. leptochilus* and *H. laevior*).

Hisonotus candombe shares with *H. ringueleti* the odontode free area along the anterior margin of the snout and posterior margin of the pectoral spine serrated. However, *H. candombe* differs from *H. ringueleti* in having larger pectoral spine serrae distributed all along the posterior margin. In *H. ringueleti* the serrae are smaller and placed on distal two thirds of posterior margin of pectoral spine. *Hisonotus candombe* has five branched anal-fin rays and males with smaller flap on pelvic fin whereas *H. ringueleti* bears 4 anal-fin rays and a well developed flap.

Comparative material examined (SL in mm). *Hisonotus* sp. A: AI 171, 3 ex., 21.0-32.2 (C&S), República Oriental del Uruguay, Departamento Canelones, Río de la Plata basin, arroyo Tropa Vieja. *Hisonotus candombe* sp. n.: AI 177, 1 ex., 29.7 (C&S), República Oriental del Uruguay, Departamento Salto, río Uruguay basin, arroyo Palomas. *Hisonotus maculipinnis* (Regan, 1912): AI 122, 1 ex., 27.5 (C&S), Argentina, Corrientes province, río Paraná, Ita Ibaté. AI 123, 5 ex., 23.4-27.0, Argentina, Corrientes province, río Paraná basin, Esteros del Iberá, Rincón del Diablo, Laguna Yacaré. *Hisonotus nigricauda* (Bouleng-

Fig. 4. Arroyo Palomas, type locality of *Hisonotus candombe* spec. nov.

er, 1891): AI 178, 6 ex., 30.0-38.0, Brazil, Rio Grande do Sul, São Leopoldo, Yacuí, rio dos Sinos. *Hisonotus* sp. B, AI 120, 1 ex., 23.3, Argentina, Misiones, río Uruguay basin, arroyo Oveja Negra. *Hisonotus* sp. C: MHNG 2408.025, 10 ex., 17.8-29.0, Paraguay, route 2, arroyo Pirayu. *Hisonotus ringueleti* Aquino, Schaefer & Miquelarena, 2001: AI 179, 1 ex., 36.4, República Oriental del Uruguay, Departamento Artigas, río Uruguay basin, arroyo Lenguazo. *Hypoptopoma inexspectatum* (Holmberg, 1893): AI 119, 1 ex., 35.0, Argentina, Corrientes province, río Paraná, Puerto Abra. *Otocinclus flexilis* Cope, 1894: AI 117, 2 ex., 36.0-36.5, Argentina, Entre Ríos province, arroyo Ñancay. *Otocinclus vestitus* Cope, 1872: AI 118, 3 ex., 26.0-30.4, Argentina, Corrientes province, río Paraná, Puerto Abra. *Otocinclus vittatus* Regan, 1904: AI 121, 1 ex., C&S, 27.0, Argentina, Corrientes province, río Paraná, Ita Ibaté. AI 127, 1 ex., 26.2, Argentina, Buenos Aires province, Río de la Plata basin, arroyo El Pescado. *Epactionotus yasi* Almirón, Azpelicueta & Casciotta, 2004: MACN-ict 8649, 1 ex., 32.0, Argentina, Misiones province, río Iguazú basin, arroyo Lobo. *Epactionotus aky* Azpelicueta, Casciotta, Almirón & Körber, 2004: AI 124, holotype, 30.5, Argentina, Misiones province, río Uruguay basin, Arroyo Garibaldi.

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References

Boeseman, M. 1968. The genus *Hypostomus* Lacépède, 1803, and its Surinam representatives (Siluriformes, Loricariidae). – Zool. Verh. **99**: 3-89

Eigenmann, C. H. & R. S. Eigenmann, 1889. Preliminary notes on South America Nematognathi. – Proc. Calif. Acad. Sci. ser 2, **2**: 28-56

Leviton, A. E., R. H. Gibbs, Jr., E. Heal & C. E. Dawson 1985. Standards in herpetology and ichthyology: Part I. Standard symbolic codes for institutional resource collections in herpetology and ichthyology. – Copeia **1985** (3): 802-832

Reis, R. E. & S. A Schaefer 1998. New cascudinhos from southern Brazil: Systematics, endemism, and relationships (Siluriformes, Loricariidae, Hypoptopomatinae). – Amer. Mus. Nov. (3254): 1-25

Schaefer, S. A. 1998. Conflict and resolution: impact of new taxa on phylogenetic studies of the neotropical cascudinhos (Siluroidei: Loricariidae). In: Malabarba L. R., R. E. Reis, R. P. Vari, Z. M. S. Lucena & C. A. S. Lucena (eds): Phylogeny and Classification of neotropical fishes. – EDIPUCRS, Porto Alegre 1998: 375-400.

Taylor, W. R. & G. C. Van Dyke 1985. Revised procedures for staining and clearing small fishes and other vertebrates for bone and cartilage study. – Cybium **9** (2): 107-119

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Type catalogue of amphibians in the Zoologische Staatssammlung München

Frank Glaw & Michael Franzen

Glaw, F. & M. Franzen (2006): Type catalogue of amphibians in the Zoologische Staatssammlung München. – Spixiana **29/2:** 153-192

We provide a first complete list of the present and lost amphibian type specimens of the Zoologische Staatssammlung München (ZSM) and discuss various problems involved. The collection currently houses primary types of 61 taxa (45 holotypes, eight lectotypes, three neotypes, and five taxa based on syntype series), 41 of them currently considered as valid. Furthermore, 72 taxa are exclusively represented by secondary types (paratypes, paralectotypes), resulting in type material of 133 taxa.

The ZSM collection strongly suffered from losses during World War II. Primary type specimens of approximately 65 amphibian taxa have been obviously destroyed during that time.

The historical focus of the collection was South America and was primarily based on material collected by Spix and Martius during their expedition to Brazil from 1817 to 1820. 50 amphibian taxa are based on material collected during this expedition, but currently specimens of only 14 taxa are still present in Munich. Subsequently, herpetological research in South America was continued during the first half of the 20th century by L. Müller und W. Hellmich, who designated type material of 24 anuran taxa in the ZSM, 11 of them still represented by primary types. Recently, the focus of the taxonomic work on amphibians has shifted to Madagascar. This has resulted in the presence of 19 holotypes and additional 50 taxa represented by paratypes from that country.

An extensive search in the herpetological collection resulted in the rediscovery of type material of *Caecilia annulata* Wagler, 1824 and *Hyla lateristriga* Spix, 1824, which formerly was presumed to be lost.

Frank Glaw, Michael Franzen, Zoologische Staatssammlung, Münchhausenstr. 21, 81247 München, Germany; e-mail: Frank.Glaw@zsm.mwn.de.

Introduction

The Zoologische Staatssammlung München (ZSM) is one of the major natural history museums in Germany. The first important herpetological collections were obtained by an expedition of Johann Baptiste Ritter von Spix to Brazil during the years 1817-1820. A short history of the herpetological collection is given by Gruber (1992) and Glaw & Fuchs (2001).

During World War II large parts of the collection including many type specimens have been destroyed. After the war there was significant uncertainty about the survival of the type specimens. This led to the situation that several types were considered or assumed to be lost although being extant whereas other types considered present were actually lost (e. g. Frost 1985). In 1983 Hoogmoed & Gruber published a detailed catalogue of the type specimens of the Spix collection (species described by Spix and Wagler). This work removed much of the uncertainties which hindered the taxonomic research of Brazilan species.

However, the types of the other amphibian and reptile taxa of the ZSM were never reviewed and their status (extant or lost) remained unknown in many cases. In 1998, we therefore undertook a first attempt to clarify the situation of the herpetological

Fig. 1. The herpetological type material of the ZSM.

types in the ZSM. We removed all type specimens from the main collection and transferred them into a closed area of the collection, and continuously searched for cryptic types. However, it soon became clear that a complete revison of the type material is a time consuming task that could not be finished without additional man power. It was therefore good luck that in 2003 the Global Biodiversity Information Facility (GBIF) started a programme to create a database of the type specimens in German research museums (Glaw & Franzen 2003, 2004, Naumann & van den Elzen 2004). This programme provided the funding to work intensively on the electronic type catalogue and therefore was an important basis for the written type catalogue presented here. The second part, the type catalogue on the reptiles, will be published in a forthcoming paper.

The numbering systems of the herpetological ZSM collection

Until 1997, the herpetological ZSM material was listed in a total of 11 handwritten catalogues. Since 1998, the catalogue is continued as an electronic database (Access). Until 1997 a catalogue number either included a single specimen or a series of specimens (generally) from the same locality and with same collection data. Since 1998 each specimen has an individual catalogue number and bears an individual tag.

Old numbering system. Old numbers consist of a running number, followed by a "/0" (e.g. ZSM 1021/0, the holotype of *Brachycephalus ephippium*). Catalogue I includes ZSM 1/0 to 1824/0 (pp. 172-192, 130-162), catalogue II ZSM 1825/0 to 2753/0 (pp. 155-182), and catalogue III ZSM 3000/0 to 3218/0 (pp. 189-196). In addition, there is a small skeleton collection (catalogue II, page 132) with the numbers ZSM 2506/0a-2536/0a. The material with the old numbering system includes much of the collections of Spix, old specimens without collection dates, and other material collected until 1907. To identify individuals of a series, each specimen is numbered as shown in the following example: ZSM 2710/0 (2 specimens) is now labeled ZSM 2710/0/1 and ZSM 2710/0/2.

Current numbering system. In 1907, a new catalogue was started and a new numbering system was introduced. It consists of a running number, followed by a "/" and the year in which they were catalogued (example ZSM 1/1964, the holotype of *Chthonerpeton hellmichi*). This system is still in use. Catalogue I includes the years 1907-1921, catalogue II the years 1922-1946, catalogue III the years 1947-1967, and catalogue IV the years 1968-1997. To identify individuals of a series catalogued before 1998, each specimen is numbered as shown in the following example: ZSM 54/1914 (2 specimens) is now labeled ZSM 54/1914/1 and ZSM 54/1914/2. In several cases old individual markings indicated by letters are changed to numerals (e.g. ZSM 2691/0 A and ZSM 2691/0 B are changed to ZSM 2691/0/1 and ZSM 2691/0/2).

Sammlung Lorenz Müller. Parallel to the numbering systems outlined above, the collection Lorenz Müller (SLM) was catalogued separately in running numbers. This collection exclusively includes specimens from Europe, Africa north of the Sahara, and western Asia. The Lorenz Müller collection comprises three separate catalogues: Catalogue I includes the numbers 1-1469, catalogue II the numbers 1470-2920, and catalogue III the numbers 2921-5179. Finally, there is a further (fourth) catalogue (Sammlung Lorenz Müller 1962-1973) with the same numbering system that is used for the regular ZSM collection, i.e. a running number followed by "/" and the year in which the specimens were catalogued (e.g. 1/1962). Since this numbering system is easily confused with the regular ZSM numbers, we intend to re-number these specimens (Sammlung Lorenz Müller 1962-1973) in future.

Specimens from the Lorenz Müller collection are indicated by the acronym SLM in parentheses (e. g. ZSM (SLM) 3399). To identify individuals of a series, each specimen is numbered as shown in the following example: ZSM (SLM) 3401 (2 specimens) is now labeled ZSM (SLM) 3401/1 and ZSM (SLM) 3401/2.

The amphibian type specimens of the ZSM collection

In the following accounts families are listed alphabetically within each order. Within each family genus and species names are ordered alphabetically according to their original names. We generally follow the classification of Frost (2004) with recent modifications, especially the work of Faivovich et al. (2005). The informations on each taxon are provided in the following order: (1) original name including author and year of original description, (2) abbreviated reference of the original description, (3) listing of the type specimens, followed by informations on the type localities (literally from the original description if given between quotation marks), collector(s), and collection dates, (4) remarks, (5) present name. If the section "present name" is absent, the original name is still in use.

In many cases, the type material of a given taxon was only partially destroyed during WWII. We therefore decided to present information on extant and lost type material together. Extant type material is <u>underlined</u> to emphasize its presence whereas "(lost)" immediately after a catalogue number indicates its absence.

For taxa described by Spix and Wagler we generally follow the opinions and conclusions of Hoogmoed & Gruber (1983) who provide detailed and convincing discussions on each taxon which are not repeated here. This is especially true for the identity of the type material which sometimes can not be interpreted unambiguously.

Abbreviations

The following institutional abbreviations are used:

BMNH	The Natural History Museum, London
KU	University of Kansas, Museum of Natural History, Lawrence
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge
MNHN	Museum national d'Histoire naturelle, Paris
MRSN	Museo regionale di Scienze Naturali, Torino
MSNG	Museo Civico di Storia Naturale di Genova
MTD	Museum für Tierkunde, Dresden
MVZ	Museum of Vertebrate Zoology, Berkeley
MZUF	Universita di Firenze, Museo Zoologico de la Specola, Firenze
MZUT	Museo Zoologico dell'Universitá di Torino; specimens currently in MRSN
NHRM	Naturhistorisca Riksmuseet, Stockholm
NMBE	Naturhistorisches Museum, Bern
NMW	Naturhistorisches Museum, Wien
SMF	Senckenberg Museum, Frankfurt
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden
UADBA	Université d'Antananarivo, Département de Biologie Animale, Antananarivo
UMMZ	University of Michigan Museum of Zoology, Ann Arbor
ZFMK	Zoologisches Forschungsmuseum Alexander Koenig, Bonn
ZIL	Zoological Institute Leningrad, St. Petersburg
ZIUW	Zoologisches Institut, Universität Wien
ZMA	Zoölogisch Museum, Amsterdam
ZMB	Museum für Naturkunde, Berlin
ZMH	Zoologisches Museum, Hamburg
ZSM	Zoologische Staatssammlung, München

Further abbreviations used:

coll.	collected by
don.	donated by
orig.	original

Order Gymnophiona

Caeciliidae Rafinesque, 1814

Caecilia annulata Wagler, 1824

Serp. Brasil. Spec. Nov. Hist. Nat. Nouv. Serpens.: 74

Paralectotype: <u>ZSM 1323/0</u>, adult, "Habitat numerosa in provincia Bahiae, in paludum vicinitate" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The specimen was presumed to be lost by Hoogmoed & Gruber (1983), but is present in the Munich collection. Hoogmoed & Gruber (1983) designated RMNH 2419 as lectotype.
Present name: *Siphonops annulatus* (Mikan, 1820) fide Frost (2004).

Caecilia elongata Dunn, 1942

Bull. Mus. Comp. Zool. 91: 527

Holotype: One of two specimens originally catalogued as ZSM 1327/0 (lost), adult(s), "Panama", coll. Amon, no date.
Paratype(s): ZSM 1324/0 (lost), two specimens according to the catalogue, one specimen according to the card index, same data as ZSM 1327/0.

Fig. 2. *Caecilia marcusi* Wake, 1984, holotype (ZSM 79/1982).

Present name: *Oscaecilia elongata* (Dunn, 1942) according to Taylor (1968: 605-607), see also Lahanas & Savage (1992) for further remarks.

Caecilia marcusi **Wake, 1984**

Amphibia-Reptilia 5: 215

Holotype: ZSM 79/1982, male, "Villa Tunari, 400 m, via San Antonio on Rio Chapare", Cochabamba, Prov., Bolivia", coll. H. Marcus, collection date unknown, probably early 1940's.
Paratypes: ZSM 82/1982, adult, ZSM 83/1982, adult, same collection data as holotype.
Remarks: The registry number of the holotype was erroneously given as 70/1982 by Duellman (1993: 312) and Frost (2004).

Nectocaecilia ladigesi **Taylor, 1968**

Caecilians of the world: 275

Holotype: ZSM 245/1925, adult, "Bocca do Mojú, Staat Pará, Brasilien" (label data), coll. O. A. Farias, 10.1911.
Remarks: Holotype erroneously mentioned to be housed in ZMH ("ZMH 1925/245") by Frost (1985: 640) and Frost (2004).
Present name: *Typhlonectes compressicauda* (Duméril & Bibron, 1841) according to Wilkinson (1991).

Ichthyophiidae Taylor, 1968

Chthonerpeton hellmichi **Taylor, 1968**

Caecilians of the world: 305

Holotype: ZSM 1/1964 (cited as "ZSM Temporary No. 1-1964" in caption of Fig. 160 of the original description), adult, locality uncertain, according to the original description: "Punta Lara [...] I suspect it is in the vicinity of the Rio de la Plata" and in caption of Fig. 160 "Brasil". According to the card index and jar labels "Punta Lara, Rio La Plata, Argentina". Exact collection date uncertain: one jar label states September 1963, the other November 1963, coll. R. Foerster.
Present name: Uncertain, according to Nussbaum & Wilkinson (1987) presumably a synonym of *C. indistinctum* (Reinhard & Lütken, 1861).

Order Urodela

Plethodontidae Gray, 1850

Spelerpes Dofleini **Werner, 1903**

Abh. K. Bayer. Akademie Wiss. II. Kl. 22: 352

Holotype: ZSM 1288/0 (lost), adult, "Coban, Guatemala" (catalogue and card index), coll. Sapper, no date.

Remarks: McCranie et al. (1996) discussed the identity of the lost holotype and designated a neotype (MVZ 161627).
Present name: *Bolitoglossa dofleini* (Werner, 1903), see McCranie et al. (1996).

Spelerpes palmatus **Werner, 1897**

Zool. Anz. 20: 266

Paralectotypes: ZSM 1272/0 (lost), 2 adults, "Ecuador", coll. M. Wagner, no date.
Remarks: NMW 22862, formerly ZIUW q43 (Häupl et al. 1994) was designated as lectotype by Brame & Wake (1962: 173).
Present name: *Bolitoglossa palmata* fide Brame & Wake (1962: 173-176).

Salamandridae Goldfuss, 1820

Euproctus asper **f.** *castelmouliensis* **Wolterstorff, 1925**

Abh. Ber. Mus. Magdeburg 4: 66

Paralectotype: ZSM (SLM) 3399, female, "Torrent de Castelmouly bei Bagnères de Bigorre, Pyrenaeen, Frankreich" according to the catalogue, collector not indicated, but most probably L. Lantz, don. W. Wolterstorff, 1926.
Remarks: Lectotype designation (SMF 1167) by Mertens (1967: 37).
Present name: *Euproctus asper* (Dugès, 1852) is currently regarded monotypic (see Clergue-Gazeau 1999: 258).

Molge alpestris **var.** *Reiseri* **Werner, 1902**

Verh. Zool.-Bot. Ges. Wien 52: 7

Syntypes: ZSM (SLM) 3401/1-2, 1 male, 1 female, "in einem 1636 m hoch gelegenen, kleinen Gebirgssee: Prokosko jezero (westlich von der bosnischen Ortschaft Fojnica)" (original description), "Vranika-Gebirge, Bosnien" (label data), collector and date not indicated on the label, but probably collected in August 1901 by O. Simony.
Present name: Regarded as a synomym of the nominate subspecies (Roček et al. 2003: 625).

Molge italica **Peracca, 1898**

Boll. Mus. Zool. Anat. Comp. Univ. Torino 13 (317): 1

Paralectotypes: ZSM (SLM) 937/1-3, 2 males, 1 female, "Potenza, Süd-Italien" (label), collector unknown, Peracca don., 04.1898; ZSM (SLM) 942/1-6, 3 males, 3 females, "Potenza, Süd-Italien", coll. Peracca, 1898.

Fig. 3. *Salamandra salamandra almanzoris* Müller & Hellmich, 1935, holotype (ZSM [SLM] 2046). This taxon is one of several fire salamander subspecies from Spain.

Remarks: ZSM (SLM) 873, three specimens labeled "Potenza, Frühjahr 1902, Dr. Peracca" were obviously collected or donated in spring 1902. If they were collected in 1902, they are clearly no paralectotypes. However, if they were donated in 1902 they possibly represent paralectotypes. Gavetti & Andreone (1993: 127) designated MZUT An590.1 as lectotype and noted the existence of further paralectotypes in MZUT, BMNH, NMW and MZUF, but did not mention the ZSM paralectotypes.
Present name: *Triturus italicus* (Peracca, 1898), see Sparreboom (2003).

Fig. 4. *Bufo Ephippium* Spix, 1824 (holotype ZSM 1021/0), now *Brachycephalus ephippium*, is the type species of the genus *Brachycephalus* and was the first described species of the family Brachycephalidae.

Salamandra salamandra almanzoris **Müller & Hellmich, 1935**

Zool. Anz. 112: 49

Holotype: ZSM (SLM) 2046, male, "Laguna Grande de Gredos (2027 m)" (original description, label), coll. W. Hellmich, 04.06.1935.
Paratypes: ZSM (SLM) 2047 (lost, 1 male, 1 female), ZSM (SLM) 2048 (lost, 4 juveniles), same data as holotype.
Present name: Valid subspecies according to Thiesmeier & Grossenbacher (2004: 1076).

Triturus helveticus punctillatus **Schmidtler, 1969**

Abh. Ber. Naturkd. Vorgesch. Magdeburg 11: 221

Paratypes: ZSM 28/1998-33/1998, 6 adults, "Pozo Negro ('Schwarzer Brunnen'), 1770 m, Karsee in der Sierra de la Demanda, s. Fresneda de la Sierra (Burgos)" (original description), coll. J. J. & J. F. Schmidtler, 30.04.1962 and 15.05.1964.
Remarks: The original type series consisted of 30 specimens according to the original description. The holotype (without registry number) was sent to KMM (= Kulturhistorisches Museum Magdeburg = MM), where it was probably lost (J. F. Schmidtler, pers. comm.). The collection date of the holotype ("l. [= legit] 15.5.64") was erroneously interpreted as registry number by Frost (2004). Some of the paratypes, which were still alive when the original description was prepared, should be deposited in the SMF according to Schmidtler (1969). However, G. Köhler (pers. comm.) did not find any specimens in the SMF collection.
Present name: The validity of this taxon is questioned by Schlüpmann & van Gelder (2004: 798).

Order Anura

Brachycephalidae Günther, 1858

Bufo Ephippium **Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 48

Holotype: ZSM 1021/0, adult, "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Brachycephalus ephippium* (Spix, 1824) fide Frost (2004).

Ephippipher Spixii **Cocteau, 1835**

Mag. Zool. Anat. 5: 12

Holotype (according to Hoogmoed & Gruber 1983: 374)**:** ZSM 1021/0, adult, Province of Bahia [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Considered as replacement name for *Bufo Ephippium* Spix, 1824 (see Hoogmoed & Gruber 1983: 374 for comment).
Present name: *Brachycephalus ephippium* (Spix, 1824) fide Frost (2004).

Bufonidae Gray, 1825

Atelopus cruciger vogli **Müller, 1934**

Zool. Anz. 108: 151

Holotype: ZSM 3/1933, adult female, "Obere Wasserfälle des Rio Juey 'Las Peñas', nahe der Hacienda 'La Trinidad', Maracay (700 m), Venezuela" [label], "Schlucht 'Las Peñas' (600 m), unweit von Maracay" [original description], coll. C. Vogl, 1933.
Paratypes: ZSM 285/1933/1-8 (5 males, 3 females, all cleared & stained), ZSM 285/1933/9-317, ZSM

350/1999-464/1999, 432 specimens, same data as holotype.
Remarks: Solano (1969) mentioned only 316 specimens. Lötters et al. (2004) discussed the number of paratypes. Paratype ZSM 285/1933/320 has been exchanged (now ZMA 20335). Paratypes ZSM 285/1933/318-319 have been exchanged with ZFMK. Paratype ZSM 285/1933/317 has been exchanged with NMBE. Rivero (1961: 173) lists UMMZ 92431 (1 specimen) and MCZ 20923-5 (3 specimens) as paratypes. Additional paratypes are mentioned by Cochran (1961: 30). *Atelopus vogli* is considered as extinct (Global amphibian assessment, http://www.globalamphibians.org).
Present name: *Atelopus vogli* according to Lötters et al. (2004).

Bufo acutirostris Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 52

Holotype: ZSM 1147/0, male, "Habitat ad flumen Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo acutirostris* Spix, 1824 (re-established by Hoogmoed 1990). For photographs of the holotype (dorsal and ventral view) see Lötters & Köhler (2000).

Bufo albicans Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 47

Lectotype: ZSM 1140/0 (designated by Hoogmoed & Gruber 1983), subadult, "Habitat ad flumen Nigrum" [Brazil, Rio Negro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Paralectotype RMNH 2191.
Present name: *Bufo marinus* (Linnaeus, 1758) fide Frost (2004).

Bufo bufo gredosicola Müller & Hellmich, 1935

Zool. Anz. 112: 54

Holotype: ZSM (SLM) 2049 (lost), male, "Laguna Grande de Gredos, 2027 m" [Spain], coll. W. Hellmich, 04.06.1935.
Paratypes: ZSM (SLM) 2050 (lost, 7 males), ZSM (SLM) 2051 (lost, 7 males, 1 female), all with the same data as holotype.
Present name: Considered as valid subspecies (Mertens & Wermuth 1960: 46).

Fig. 5. *Atelopus cruciger vogli* Müller, 1934, holotype (ZSM 3/1933). This taxon is now considered a distinct species that has gone extinct.

Bufo dorsalis Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 46

Lectotype: ZSM 1141/0/3 (ZSMH 1141/0 A in Hoogmoed & Gruber 1983), female, "Habitat [...] in Provincia Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotypes: ZSM 1141/0/1-2 (ZSMH 1141/0 B, C in Hoogmoed & Gruber 1983), 1 male, 1 subadult, same data as lectotype.
Remarks: Spix (1824) originally mentioned the existence of five syntypes. Three of them are still extant in the ZSM and RMNH 2189 is a further paralectotype. The fifth specimen has not been located. Frost (2004) erroneously stated that Hoogmoed & Gruber (1983) designated RMNH 2189 as lectotype.
Present name: *Bufo ornatus* Spix, 1824 according to Baldissera et al. (2004).

Bufo globulosus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 49

Holotype: ZSM 41/0 (lost), juvenile?, "Habitat ad flumen Itapicuru" [Brazil, Rio Itapicuru, probably between Caxias (04°50'S, 43°21'W) and Arrarial (02°37'S, 44°41'W) according to Vanzolini 1981], coll.

Fig. 6. *Bufo granulosus major* Müller & Hellmich, 1936, one of the two remaining syntypes (ZSM 202/1929/1).

Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Müller & Hellmich (1936: 7-8) noted that *Bufo granulosus* has priority over *Bufo globulosus* under the Principle of First Revisor. Frost (2004) did not list *Bufo globulosus* in the synonymy of *B. granulosus.*
Present name: *Bufo granulosus* Spix, 1824 fide Hoogmoed & Gruber (1983).

Bufo granulosus **Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 51

Holotype: ZSM 40/0 (lost), "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Müller & Hellmich (1936: 7-8) noted that *Bufo granulosus* has priority over *Bufo globulosus* under the Principle of First Revisor.
Present name: *Bufo granulosus granulosus* Spix, 1824.

Bufo granulosus major **Müller & Hellmich, 1936**

Wiss. Ergebn. Deutsch. Gran Chaco-Exped., Amph. Rept., 1: 12

Syntypes: ZSM 147/1928 (lost, 18 specimens), ZSM 153/1928 (lost, 1 specimen), and ZSM 202/1929/1-2 (originally ZSM 202/1929, 5 specimens, 3 of them lost), "San José de Chiquitos, Prov. Santa Cruz" [Bolivia], coll. Deutsche Chaco Expedition, 10. 1926.
Remarks: The original description does not clearly indicate which of the mentioned specimens are to be considered as type material. We here consider all specimens from the locality "San José de Chiquitos" listed in the table on page 7 as syntypes. This includes ZSM 147/1928, ZSM 153/1928 and 5 individuals without given catalogue number. These latter specimens apparently have the catalogue number ZSM 202/1929 as all collection data are fully identical with the data given in the table on page 7 in Müller & Hellmich (1936). ZSM 202/1929 originally included 5 specimens. We were not able to locate three of these specimens whereas the remaining two are still extant, ZSM 202/1929/1 (adult) and ZSM 202/1929/2 (juvenile).
Present name: *Bufo granulosus major* (Cei 1980: 189-190; De la Riva et al. 2000: 26-27).

Fig. 7. *Bufo proboscideus* Spix, 1824, holotype (ZSM 1145/0).

Bufo kelloggi Taylor, 1936

Univ. Kansas Sci. Bull. 24 (20): 510

Paratypes: ZSM 70/1947/1-2 (E. H. Taylor collection numbers 27, 33), 2 adults, "two miles east of Mazatlán, Sinaloa" [Mexico], coll. E. H. Taylor, 21.07. 1934.
Present name: *Bufo kelloggi* Taylor, 1936 (see Flores-Villela 1993: 15).

Bufo laevissimus Werner, 1897

Sitzungsber. math.-physik. Cl. k. bayer. Akad. Wiss. 27: 212

Syntypes: ZSM 148/1989/1-2 (2 juveniles), "Kamerun" (original description, label), collector unknown, no date; ZSM 1113/0 (lost), adult female, same data as ZSM 148/1989.
Remarks: Frost (2004) erroneously reports a "holotype" to be housed in "ZMH". However, it is clear from the original description that no type or holotype was designated. Therefore we regard all three specimens as syntypes. "ZMH" is most probably an error for ZSM.
Present name: *Bufo superciliaris* Boulenger, 1888 according to Andersson (1905: 26-28).

Bufo Lazarus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 45

Syntypes: ZSM 2513/0 (lost), 2 specimens, "Habitat in sylvis fluvii Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo marinus* (Linnaeus, 1758) fide Frost (2004).

Bufo maculiventris Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 43

Syntypes: Uncatalogued (lost), 4 specimens, "Habitat [...] in sylvis et aquis paludosis ad ripam fluminis Solimoëns" [Brazil, Rio Solimões] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo marinus* (Linnaeus, 1758) fide Frost (2004).

Bufo naricus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 49

Holotype: Uncatalogued (lost), female, "Habitat ad flumen Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981),

Fig. 8. *Bufo pseudoraddei baturae* Stöck, Schmid, Steinlein & Grosse, 1999, holotype (ZSM 103/1998). The Batura toad is hitherto the only known bisexual vertebrate species with populations of exclusively triploid individuals.

coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: Listed under *Bufo margaritifer* (Laurenti, 1768) by Frost (2004), but considered as a nomen dubium by Lötters & Köhler (2000).

Bufo ornatus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 45

Lectotype: ZSM 2691/0/1 (ZSMH 2691/0 A in Hoogmoed & Gruber 1983), subadult, "Habitat in Provincia Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: ZSM 2691/0/2 (ZSMH 2691/0 B in Hoogmoed & Gruber 1983), subadult, same data as lectotype.
Remarks: Spix (1824) originally mentioned the existence of two syntypes. However, Hoogmoed & Gruber (1983) mention three type specimens, the lectotype and two paralectotypes (ZSMH 2691/0 and RMNH 2157). Cochran (1955) considered ZSM 2691/0 as the two syntypes of *B. ornatus*. Hoogmoed & Gruber (1983) did not provide evidence why RMNH 2157 should be considered as one of the type specimens. Frost (2004) erroneously stated that Hoogmoed & Gruber (1983) designated RMNH 2157 as lectotype.
Present name: *Bufo ornatus* Spix, 1824. Until recently considered as a synonym of *Bufo crucifer* Wied, 1821, the species was resurrected by Baldissera et al. (2004).

Bufo polycerus Werner, 1897

Sitzungsber. math.-physik. Cl. k. bayer. Akad. Wiss. 27: 211

Holotype: ZSM 45/0 (lost), female, "Kamerun" (original description & card index) [Cameroon], coll. Zimmerer, no date.
Present name: Synonym of *Bufo tuberosus* (Günther, 1858) according to Parker (1936: 155).

Bufo proboscideus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 52

Holotype: ZSM 1145/0, male, "Habitat ad flumen Solimoens" [Brazil, Rio Solimões] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo proboscideus* Spix, 1824 was re-established by Hoogmoed (1990).

***Bufo pseudoraddei baturae* Stöck, Schmid, Steinlein & Grosse, 1999**

Ital. J. Zool. 66: 221

Holotype: ZSM 103/1998, male, "plain above the right bank of the Hunza river, near the mouth of the Batura glacier, opposite the mouth of the Shimshal river, north of the village of Pasu, 2700 m a.s.l., Karakoram, Pakistan" [original description], coll. M. Stöck & H. Veith, 06.1997.
Paratypes: ZSM 104/1998, male, ZSM 105/1998, young female, ZSM 113/1998, female, same data as holotype; ZSM 101/1998, male, ZSM 102/1998, female, "Sust, from the valley slope above the settlement on the left bank of the Hunza river, 2950 m a.s.l., Karakoram, Pakistan" (original description), coll. M. Stöck, 06.1996.
Remarks: The paratype ZSM 114/1998 (now ZFMK 74229) has been exchanged.

***Bufo semilineatus* Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 51

Holotype: ZSM 1331/0, juvenile, "Habitat ad flumen Itapicuru" [Brazil, Rio Itapicuru, probably between Caxias (04°50'S, 43°21'W) and Arrarial (02°37'S, 44°41'W) according to Vanzolini 1981], coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo crucifer* Wied, 1821 fide Frost (2004) and Baldissera et al. (2004).

***Bufo simus* Schmidt, 1857**

Sitzungsber. Akad. Wiss. Wien, math. naturwiss. Kl. 24: 10

Paralectotype: ZSM 543/1920 (lost), 1 specimen, "Chiriqui, Costarica" (card index), "Neu-Granada" (original description), no information on collector and date in the catalogue, but most probably collected by J. v. Warszewics and received from Kraukau Museum in 1898.
Remarks: The paralectotype was erroneously given as 593/20 by Savage (1972). The type locality was later restricted to "Rio Chiriqui River near Bocas del Toro" [Panama] by Schmidt (1858), but this seems to be also erroneous according to Savage (1972). Lectotype (BMNH 1947.2.21.18) designated by Savage (1972).
Present name: *Bufo simus* Schmidt, 1857 according to Savage (1972).

***Bufo Spixii* Fitzinger, 1826**

Neue Classific. Rept. natürl. Verwandtschaften: 65

Lectotype: ZSM 1343/0 (designated by Hoogmoed & Gruber 1983), male, "Habitat in Provincia Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: *Bufo Spixii* Fitzinger, 1826 is a replacement name for *Bufo scaber*. RMNH 2190 is the paralectotype.
Present name: *Bufo ornatus* Spix, 1824 according to Baldissera et al. (2004).

***Bufo stanlaii* Lötters & Köhler, 2000**

Spixiana 23 (3): 295

Paratype: ZSM 144/1999, adult, "La Hoyada (17° 54'S, 64°08'W), Provincia Florida, Departamento Santa Cruz, Bolivia, 1700 m above sea level", coll. J. Köhler & S. Lötters, 16.11.1998.

***Bufo stellatus* Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 46

Holotype: Not designated although including animal figured on pl. 18, fig. 1 of the original publication (lost); presumably originally in ZSM or RMNH (Frost 2004). "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Bufo crucifer* Wied, 1821 fide Frost (2004) and Baldissera et al. (2004).

***Bufo surdus annulatus* Schmidtler & Schmidtler, 1969**

Salamandra 5: 118

Holotype: ZSM 4/1968, subadult, "5 km nördlich Mekuh, 1400 m ü. M. (70 km südlich Schiras), auf dem nördlichen Fahrtweg zur Straße Schiras-Firuzabad" (original description), coll. J. J. & J. F. Schmidtler, 10.04.1968.
Present name: *Bufo surdus surdus* Boulenger, 1891 according to Stöck et al. (2001).

***Bufo viridis turanensis* Hemmer, Schmidtler & Böhme, 1978**

Zool. Abh. Staatl. Mus. Tierk. Dresden 34: 378

Paratypes: ZSM 34/1998 (originally MTD 11181), male; ZSM 35/1998 (originally MTD 11192), female, "Duschanbe (Stadtrand), Tadshikische SSR/UdSSR" (original description), coll. F. J. Obst, 25.-27.09. 1975.
Remarks: Holotype MTD 11195; further paratypes in MTD, ZFMK and ZIL according to the original description and Böhme & Bischoff (1984).
Present name: *Bufo viridis turanensis* (see Stöck et al. 2001).

Fig. 9. *Phrynidium crucigerum* Lichtenstein & Martens, 1856, neotype (ZSM 93/1947/10). *Atelopus cruciger* is considered as critically endangered.

Fig. 10. *Hyla uranoscopa* Müller, 1924, holotype (ZSM 81/1921), now *Hyalinobatrachium uranoscopum*. This is a representative of the Neotropical Centrolenidae which have a transparent ventral side.

Bufo viridis zugmayeri Eiselt & Schmidtler, 1973

Ann. Naturhist. Mus. Wien 77: 206

Holotype: ZSM 211/1911/2 (given as ZSM 211/11-2 in the original description), female, "Pishin [...], Pakistan" (original description), coll. E. Zugmayer, 22.-26.11.1911.
Paratypes: ZSM 211/1911/1, ZSM 211/1911/3-18 (given as ZSM 211/11-1 & 211/11-3-18 in the original description), 17 adults and subadults, same data as holotype; ZSM 212/1911 (given as ZSM 212-11), 1 female, "Kelat" (original description), coll. E. Zugmayer, 22.-26.11.1911.
Remarks: Holotype erroneously mentioned to be housed in ZMH ("ZMH 211/11-2") by Frost (2004).
Present name: *Bufo (viridis) zugmayeri* (see Stöck et al. 2001) although its status is still under discussion.

Phrynidium crucigerum Lichtenstein & Martens, 1856

Nomenclat. Rept. Amph. Mus. Zool. Berolin.: 41

Neotype: ZSM 93/1947/10, female, "vicinity of Rancho Grande on the road from Maracay to Ocumare de la Costa (approximately 1000 m above sea level), Estado Aragua, Venezuela" [approximately 10°22'01"N, 67°41'01"W according to Lötters et al. 2004], coll. C. Vogl, 11.11.1930.
Remarks: Proposed neotype designation of Lötters & La Marca (2001) was accepted by the ICZN (Anonymus 2002, Opinion 2013).
Present name: *Atelopus cruciger* (see Lötters et al. 2004).

Centrolenidae Taylor, 1951

Hyla (Hylella) uranoscopa Müller, 1924

Zool. Anz. 59: 234

Holotype: ZSM 81/1921, male, "Humboldt (Flußgebiet des Rio Novo), Staat Santa Catharina, S. O. Brasilien" (original description) [= Corupá, Santa Catarina, Brazil according to Bokermann 1966], coll. W. Ehrhardt, 11.1919.
Present name: *Hyalinobatrachium uranoscopum* according to Ruiz-Carranza & Lynch (1991).

Dendrobatidae Cope, 1865

Epipedobates rubriventris Lötters, Debold, Henle, Glaw & Kneller, 1997

Herpetofauna 19 (110): 26

Paratype: ZSM 550/1999 (originally ZFMK 39859), 1 specimen, "El Boqueron del Padre Abad, am Rande der Carretera Central F. Basadre von Tingo María nach Pucallpa [. . .], ca. 1000 m NN, Departamento Ucayali, Perú, coll. K. Henle & A. Ehrl between 09. 1978 and 03.1983.
Remarks: Holotype and numerous paratypes in ZFMK.

Hyla nigerrima Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 36

Paralectotype: ZSM 44/0 (lost), 1 specimen,"Habitat [. . .] juxta pagum Ecgá" [Brazil, near Tefé (03°21'S, 64°42'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: RMNH 1799 was designated as lectotype by Hoogmoed & Gruber (1983).
Present name: *Epipedobates trivittatus* (Spix, 1824) fide Frost (2004).

Hyla trivittata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 35

Paralectotypes: ZSM 43/0, adult, "Habitat in sylvis humidis juxta flumen Teffé" [Brazil, Rio Tefé] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820; ZSM 42/0 (lost), same data as ZSM 43/0.
Remarks: RMNH 1836 was designated as lectotype by Hoogmoed & Gruber (1983). These authors also discuss the original number of involved type specimens.
Present name: *Epipedobates trivittatus* (Spix, 1824) fide Frost (2004).

Hyloxalus vergeli Hellmich, 1940

Zool. Anz. 131: 122

Holotype: ZSM 110/1937, male, "Bachlauf an der Finca El Vergel, nahe Fusagasugá, Ostkord. Kolumb., ca. 1800 m" (original description), coll. W. Hellmich, 15.04.1937.
Paratypes: ZSM 111/1937 (lost), 24 adults, 16 subadults and juveniles, same data as holotype, but collected 15.-18.04.1937 (catalogue).
Present name: *Colostethus vergeli* (Silverstone 1976: 6).

Fig. 11. *Hyloxalus vergeli* Hellmich, 1940, holotype (ZSM 110/1937), now *Colostethus vergeli.*

Hylidae Rafinesque, 1815

Hyla affinis Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 33

Holotype: ZSM 2495/0, male, "Habitat ad ripam fluminis Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Scinax x-signatus x-signatus* (Spix, 1824) according to Hoogmoed & Gruber (1983) and Köhler & Böhme (1996).

Hyla albomarginata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 33

Holotype: ZSM 2370/0 (lost), "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Hypsiboas albomarginatus* (Spix, 1824) according to Faivovich et al. (2005).

Hyla albopunctata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 33

Holotype: Uncatalogued (lost), no locality data given in the original description, but most probably Brazil by implication, coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Neotype (KU 100000) designated by Duellman (1971).
Present name: *Hypsiboas albopunctatus* (Spix, 1824) according to Faivovich et al. (2005).

Hyla auraria Peters, 1873

Mber. Königl. Akad. Wiss. Berlin 1873 (Oktober): 615

Holotype: ZSM 1175/0, presumably female, "angeblich aus Südamerika, ohne nähere Bezeichnung des Fundortes" (original description), "Nord-Amerika" (card index), "Süd-Amerika" (label), collector and collecting date unknown.
Present name: The identity of this species is still unknown (Faivovich et al. 2005) although it is in relatively good state of preservation.

Hyla bipunctata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 36

Syntypes: ZSM 2497/0 (lost), 1 male, 1 female, "Habitat in Provincia Bahiae, foemina mare parum maior" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Dendropsophus bipunctatus* (Spix, 1824) according to Faivovich et al. (2005).

Hyla bufonia Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 42

Holotype: Uncatalogued (lost), "Habitat prope Ecga in sylvis" [Brazil, near Tefé (03°21'S, 64°42'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Trachycephalus venulosus* (Laurenti, 1768) according to Faivovich et al. (2005).

Hyla cinerascens Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 35

Syntypes: ZSM 2498/0 (lost), 2 specimens, "Habitat ad pagum Ecgá prope flumen Teffé" [Brazil, at Tefé near Rio Tefé (approximately 03°21'S, 64°42'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Hyla cinerascens* Spix, 1824 (see Frost 2004) although Hoogmoed & Gruber (1983) suggested to supress this name in favour of the well established name *Hyla granosa* Boulenger, 1882. However, most recently Faivovich et al. (2005) again used the name *granosus* (under the genus name *Hypsiboas*).

Hyla coerulea Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 37

Lectotype: ZSM 2710/0/1 (ZSMH 2710/0 A in Hoogmoed & Gruber 1983), female, "Habitat sub foliis prope pagum Ecgá ad flumen Solimoëns" [Brazil, near Tefé (03°21'S, 64°42'W) at Rio Solimões] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: ZSM 2710/0/2 (ZSMH 2710/0 B in Hoogmoed & Gruber 1983), male, same data as lectotype.
Present name: *Scinax x-signatus x-signatus* (Spix, 1824) according to Hoogmoed & Gruber (1983) and Köhler & Böhme (1996).

Hyla delarivai Köhler & Lötters, 2001

Salamandra 37 (3): 176

Paratypes: ZSM 1/1999, female, ZSM 2/1999, male, "Provincia Chapare, Departamento Cochabamba, Bolivia [...], approximately 24 km south of Paractito on the road via El Palmar to Cochabamba (17°06'28"S, 65°33'52"W), 900-1000 m a.s.l." (original description), coll. J. Köhler & G. Suarez, 19.12.1998; ZSM 3/1999, male, "approximately 6.7 km south of Paractito on the road to El Palmar (17°03'54"S, 65°28'34"W), 500 m a.s.l." (original description), coll. J. Köhler & G. Suarez, 13.12.1998.
Present name: *Dendropsophus delarivai* (Köhler & Lötters, 2001) according to Faivovich et al. (2005).

Hyla ehrhardti Müller, 1924

Zool. Anz. 59: 233

Holotype: ZSM 80/1921, male, "Humboldt (Flußgebiet des Rio Novo), Staat Santa Catharina, S. O. Brasilien" [= Corupá, Santa Catarina, Brazil; according to Bokermann 1966], coll. W. Ehrhardt, 09. 1919.
Remarks: Faivovich et al. (2002) provided a detailed account on *Hyla ehrhardti*.
Present name: *Aplastodiscus ehrhardti* (Müller, 1924) according to Faivovich et al. (2005).

Fig. 12. *Hyla ehrhardti* Müller, 1924, holotype (ZSM 80/1921), now *Aplastodiscus ehrhardti.*

Hyla geographica Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 39

Holotype: ZSM 35/0 (lost), "Habitat in sylvis prope flumen Teffé" [Brazil, Rio Tefé] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Hypsiboas geographicus* (Spix, 1824) according to Faivovich et al. (2005).

Hyla geographica var. sive *semilineata* Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 40

Holotype: ZSM 47/0 (lost), "Habitat in arboribus Provinciae Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Hypsiboas semilineatus* (Spix, 1824) according to Faivovich et al. (2005).

Hyla lateristriga Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 32

Holotype: ZSM 48/2005, no locality data given in the original description, but most probably Brazil by implication, coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Holotype reported to be lost by Müller (1927: 267) and Hoogmoed & Gruber (1983). We found the uncatalogued specimen with a label handwritten by Hellmich "Hyla rubra Daud. – lateristriga Spix, Brasilien Spix" indicating that Spix was its collector. The specimen is in poor condition.
Present name: *Scinax ruber* (Laurenti, 1768) according to Hoogmoed & Gruber (1983) and Köhler & Böhme (1996).

Hyla lindneri Müller & Hellmich, 1936

Wiss. Ergebn. Deutsch. Gran Chaco-Exped., Amph. Rept., 1: 63

Fig. 13. *Hyla lateristriga* Spix, 1824, rediscovered holotype (ZSM 48/2005).

Holotype: ZSM 169/1929a (lost), adult female (snout-vent length 19 mm), "Junca viejo, Gob. Formosa" [Argentina], according to the original description, coll. Deutsche Chaco-Expedition, 01.1926.
Paratype: ZSM 169/1929b (lost), female (snout-vent length 16 mm), same data as holotype.
Present name: *Scinax squalirostris* (Lutz, 1925) according to Cei (1980: 556) and Duellman & Wiens (1992).

Hyla nebulosa Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 39

Syntypes: ZSM 2531/0 (lost), 2 specimens, "Habitat in sylvis prope flumen Teffé" [Brazil, Rio Tefé] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Neotype (4055 of Museu Nacional, Rio de Janeiro, also holotype of *Hyla egleri* Lutz, 1968) designated by Hoogmoed & Gruber (1983).
Present name: *Scinax nebulosus* (Spix, 1824) according to Hoogmoed & Gruber (1983) and Köhler & Böhme (1996).

Hyla papillaris Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 34

Holotype: Uncatalogued (lost), "Habitat sub foliis in sylvis prope Ecgam ad flumen Solimoens" [Brazil, near Tefé (03°21'S, 64°42'W) at Rio Solimões] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The number of type specimens is not indicated in the original description, therefore most probably based on one specimen (holotype) according to Hoogmoed & Gruber (1983: 322). Frost (2004) erroneously listed ZSM 2496/0 as syntypes of *Hyla papillaris*. These specimens, however, actually are the syntypes of *Hyla variolosa* (see below).
Present name: Synonymy with *Hyla punctata* Schneider, 1799 (currently named *Hypsiboas punctatus*: Faivovich et al. 2005) is uncertain (Hoogmoed & Gruber 1983).

Hyla pardalis Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 34

Lectotype: ZSM 2499/0 (lost, 50 mm snout-vent length according to Peters 1872), "Habitat in Provincia Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: ZSM 2499/0 (lost, 60 mm snout-vent length according to Peters 1872), same data as holotype.
Remarks: According to Peters (1872) the two former syntypes included two species. This led to a lectotype designation by implication (see Hoogmoed & Gruber 1983, and Frost 2004). The paralectotype is probably a *Hypsiboas circumdatus* (Hoogmoed & Gruber 1983).
Present name: *Hypsiboas pardalis* (Spix, 1824) according to Faivovich et al. (2005).

Hyla raddiana andina Müller, 1924

Mitt. Zool. Mus. Berlin 11: 77

Holotype: ZSM 5/1922 (lost), adult male, "Caspinchango, Valle Calchaqui (Prov. Catamarca), Argentinien" (original description), coll. Weiser, 1922.
Paratypes: <u>ZSM 18/1922/1-3</u>, 3 adults, "Nacimiento (Catamarca), Argentinien", coll. Weiser, 11.1921; ZSM 21/1922 (lost), 1 specimen, "Caspinchango (Catamarca), Argentinien", coll. Weiser, 03.1921; ZSM 22/1922 (lost), 7 specimens, "Famabalasto (Catamarca), Argentinien", coll. Weiser, 03.1922; ZSM 23/1922 (lost), 3 specimens, "Caspinchango (Catamarca), Argentinien", coll. Weiser, 03.1921.
Remarks: The catalogue, the card index and the jar label of the only remaining series (ZSM 18/1922) list the above mentioned paratypes as "Cotypen". However, they were not mentioned in the original description. All specimens have the same collector, similar collection dates (1921-1922), and were collected in the same general area (Catamarca region). The registration dates and the catalogue entries (presumbably handwritten by Müller) indicate that Müller obviously had these specimens at hand when describing the new taxon. We therefore consider them as paratypes.
Present name: *Hypsiboas andinus* according to Duellman et al. (1997: 19) and Faivovich et al. (2005).

Hyla rosenbergi Boulenger, 1898

Proc. Zool. Soc., London 1898: 123

Syntype: ZSM 1183/0 (lost), adult, "Cacha, N.-W. Ecuador, Coio-Country" (catalogue), coll. W. F. H. Rosenberg, 1896-1897.
Remarks: The type locality is given as Cachabé, Provincia Esmeraldas, Ecuador, in the original description.
Present name: *Hypsiboas rosenbergi* according to Faivovich et al. (2005).

Hyla rueppelli Boettger, 1895

Zool. Anz. 18: 137

Paralectotypes: <u>ZSM 45/1913</u> (originally SMF 1389, 3a), 1 adult, "Nord-Halmahaira" [Indonesia, northern Halmaheira], coll. Kükenthal, 1895; ZSM 22/1907 (lost, originally from SMF, number unknown), 1 specimen, "Halmahera", collection data unknown.
Remarks: Lectotype designation (SMF 2614) by Mertens (1967).
Present name: *Nyctimystes rueppelli* (Boettger, 1895) according to Zweifel (1958).

Hyla stercoracea Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 38

Holotype: Probably ZSM 1044/0 (lost), "Habitat in sylvis fluminis Teffé" [Brazil, Rio Tefé] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: Incertae sedis, possibly a species of *Hyla* sensu lato (Hoogmoed & Gruber 1983).

Hyla strigilata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 38

Holotype: ZSM 2369/0 (lost), "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: For discussion of the type material see Hoogmoed & Gruber (1983: 369).
Present name: *Scinax strigilatus* (Spix, 1824) according to Hoogmoed & Gruber (1983) and Köhler & Böhme (1996).

Hyla trachythorax Müller & Hellmich, 1936

Wiss. Ergebn. Deutsch. Gran Chaco-Exped., Amph. Rept. 1: 77

Syntypes: ZSM 156/1933 (lost), 1 male, 1 female, "Apa-Bergland (San Luis)" [Paraguay], coll. III. Chaco-Expedition, 16.09.-05.11.1931; ZSM 152/1933 (lost, 2 specimens), ZSM 153/1933 (missing, absent from loan since 1972, 7 specimens), "Apa-Bergland, Centurión (San Luis)" [Paraguay], coll. III. Chaco-Expedition, 16.09.-05.11.1931.
Remarks: Frost (2004) listed only ZSM 156/1933 (2 specimens) as syntypes. In contrast, we regard all specimens listed in the table on page 77 of the

Fig. 14. *Hyla vogli* Müller, 1938, holotype (ZSM 671/1937), now *Gastrotheca ovifera*. This is another endangered species that was recently transferred from the family Hylidae to the Leptodactylidae.

original description under "Typen" as syntypes.

In the caption of fig. 27 of Müller & Hellmich (1936) ZSM 154/1933 is indicated as "Typus" This is obviously a lapsus for 156/1933 as the number 154/1933 is not listed for *Hyla trachythorax* in the catalogue. Instead ZSM 156/1933 is indicated as type in the text on page 78 and also in the catalogue.
Present name: *Scinax fuscovarius* (Lutz, 1925) according to Faivovich et al. (2005), although Fouquette & Delahoussaye (1977) and Duellman & Wiens (1992) considered the species as valid.

Hyla variabilis Boulenger, 1896

Ann. Mag. Nat. Hist., Ser. 6, 17: 20

Syntypes: ZSM 1182/0/1-3 (originally ZSM 1182/0), 3 adults, "Cali (Columbien), 3200 Fuß" (label), coll. W. E. H. Rosenberg, 1894.
Remarks: Synonym of *Hyla columbiana* Boettger, 1892 according to Duellman & Trueb (1983).
Present name: *Dendropsophus columbianus* (Boulenger, 1896) according to Faivovich et al. (2005).

Hyla variolosa Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 37

Paralectotype: ZSM 2496/0 (lost), "Habitat in sylvis fluminis Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Hoogmoed & Gruber (1983) designated RMNH 1879 as lectotype. Duellman (1977: 90) erroneously mentioned ZSM 2495/0 (sic) as holotype (sic) of *Hyla variolosa* (see also Frost 2004).
Present name: *Hypsiboas punctatus* (Schneider, 1799) according to Frost (2004) and Faivovich et al. (2005).

Hyla vilsoniana krausi Hellmich, 1940

Zool. Anz. 129: 8-12

Holotype: ZSM 102/1937, adult male, "Laguna de Guitarra (Paramo de Sumapaz), 3460 m" [Colombia], coll. W. Hellmich, 10.03.1937.
Paratypes: ZSM 103/1937 (lost), 7 males, 1 female, 1 subadult, same data as holotype but collected by W. Hellmich & E. Kraus.
Present name: *Dendropsophus labialis* (Peters, 1863) according to Frost (2004) and Faivovich et al. (2005). *Hyla labialis krausi* according to Cochran & Goin (1970: 254-256, including a drawing of the holotype), but the subspecific distinctness was rejected by Duellman (1989).

Hyla vogli Müller, 1938

Zool. Anz. 121: 284

Holotype: ZSM 67/1937, male, "Avila (Hazienda 'Los Venados')" [Venezuela], coll. C. Vogl, 1937.
Paratype: ZSM 68/1937 (lost), female, same data as holotype.
Remarks: Frost (2004) mentions the incorrect number "ZSM 67/38" as holotype.
Present name: *Gastrotheca ovifera* (Lichtenstein & Weinland, 1854) according to Rivero (1961: 143).

Hyla x-signata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 40

Holotype: ZSM 2494/0 (lost), "Habitat in Provinciae Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Scinax x-signatus x-signatus* (Spix, 1824) according to Hoogmoed & Gruber (1983) and Köhler & Böhme 1996).

Hyla zonata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 41

Holotype: ZSM 48/0 (lost), "Habitat in arbustis et arboribus ad flumen Teffé" [Brazil, Rio Tefé] (ac-

cording to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Placed on the Official List of Rejected and Invalid Specific Names in Zoology (Frost 2004). In the original description (Spix 1824, pl. 12, fig. 1) the species is figured under the name *Hyla zonalis*.
Present name: *Trachycephalus venulosus* (Laurenti, 1768) according to Faivovich et al. (2005).

Hyperoliidae Laurent, 1943

Acanthixalus sonjae Rödel, Kosuch, Veith & Ernst, 2003

J. Herpetol. 37 (1): 44

Paratype: ZSM 980/2001, young female, "SRET station, transect X, large water-filled tree stump, secondary forest, 5°50'N, 7°20'W, Tai National Park, Ivory Coast", coll. R. Ernst & M.-O. Rödel, 16.09. 2000.

Heterixalus andrakata Glaw & Vences, 1991

Acta Biol. Benrodis 3 (2): 198

Paratype: ZSM 551/1999 (originally ZFMK 52560), female, "Sambava-Flughafen", Madagascar, coll. F. Glaw & M. Vences, 25.03.1991.
Remarks: Holotype and 3 paratypes in ZFMK.

Heterixalus punctatus Glaw & Vences, 1994

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 78

Paratype: ZSM 552/1999 (originally ZFMK 57414), male, "Andasibe", Madagascar, coll. F. Glaw & M. Vences, 01.01.-04.01.1994.
Remarks: Holotype and 1 paratype in ZFMK.

Kassina schioetzi Rödel, Grafe, Rudolf & Ernst, 2002

Copeia 2002 (3): 801

Paratype: ZSM 353/2001, from "Comoé National Park, Aussichtsbergtümpel 1, 8°45'N, 3°49'W, Ivory Coast", coll. T. U. Grafe, March-April 1997.

Leptodactylidae Werner, 1896

Borborocoetes kriegi Müller, 1926

Zool. Anz. 65: 195

Holotype: ZSM 141/1925 (lost), male, "Valdivia, Chile", coll. H. Krieg, 05.1924.
Present name: *Alsodes nodosus* (Duméril & Bibron, 1841), see Cei (1980: 294-298).

Bufo albifrons Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 48

Paralectotypes: ZSM 49/0 (lost, 1 specimen) and ZSM 50/0 (lost, 1 specimen), "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The only remaining syntype (RMNH 2272) was designated as lectotype by Hoogmoed (1986).
Present name: *Physalaemus albifrons* (Spix, 1824).

Craspedoglossa Santae-Catharinae Müller, 1922

Bl. Aquar.-Terrarienkunde 33: 168

Syntypes: ZSM 658/1920 (lost, 10 specimens), ZSM 662/1920 (lost, 1 specimen), "Humboldt, Staat Santa Catharina, Brasil" (card index), "Flußgebiet des Rio novo, Sta Catharina, Brasilien" (original description) [Corupá, Santa Catarina state, Brazil], coll. W. Ehrhardt, 11.-12.1917.
Present name: Synonym of *Cycloramphus bolitoglossus* (Werner, 1897) according to Bokermann (1966: 16) and Heyer (1983: 287).

Crossodactylus aeneus Müller, 1924

Senckenbergiana 6: 171

Holotype: ZSM 2/1924 (lost), male, "Barreira (Wasserstation an der Bahn nach Therezopolis in 500 m Höhe am Südosthang der Serra dos Orgaes), Staat Rio de Janeiro" [Brazil], coll. E. Bresslau, 14.03. 1914.
Remarks: According to Müller (1924c: 177) paratypes are present in SMF.

Crossodactylus bresslaui Müller, 1924

Senckenbergiana 6: 169

Holotype: ZSM 1/1924 (lost), male, "Gorduras (Fazenda in der Serra do Curral, s. w. von Villa Nova da Lima [Morro Velho]), Staat Minas Geraes" [Brasil], coll. E. Bresslau, 04.10.1913.
Paratypes (?): ZSM 31/1947/1-6 (originally 9 specimens, two of them exchanged with BMNH, one apparently lost), same locality, date and collector as holotype.
Remarks: According to Müller (1924c: 177) additional paratypes are present in SMF. The paratype status of ZSM 31/1947/1-6 is uncertain. The specimens were not explicitely mentioned in the original description, and their type status is neither indicated in the catalogue nor on the jar label. Müller (1927: 273) mentioned the existence of 10 specimens

Fig. 15. *Hemiphractus fasciatus* Peters, 1862, holotype (ZSM 36/0). Until 2005 the hemiphractine frogs were considered as belonging to the family Hylidae, but were now found to be more closely related to the Leptodactylidae.

(one of them being the type), all from the same locality, collected by Bresslau, 04.10.1913 with the provisional number 66. Since ZSM 31/1947 also has a provisional jar label with the number 66 this series is identical with that mentioned by Müller (1927).
Present name: According to Frost (2004) a synonym of *Crossodactylus trachystomus* (Reinhardt & Lütken, 1862).

Elosia aspera Müller, 1924

Senckenbergiana 6: 173

Holotype: ZSM 3/1924 (lost), male, "Barreira (am Südosthange der Serra dos Orgaes in 500 m Meereshöhe), Staat Rio de Janeiro" [Brazil], coll. E. Bresslau, 11.03.1914.
Remarks: According to Müller (1924c: 177) additional paratypes are present in SMF.
Present name: *Hylodes asper* (Müller, 1924) fide Frost (2004).

Elosia lateristrigata Baumann, 1912

Zool. Jahrb., Abt. Syst., Jena 33: 89

Syntype: ZSM 24/1923 (lost), 1 specimen, "Orgel-Gebirge, [in] der Umgebung von Parà" (original description), "Sierra dos Orgaes (St. Rio de Janeiro), S. O. Brasilien" (catalogue), coll. E. A. Goeldi, no date, received in 1923 from Bern Museum (NMBE).
Remarks: The specimen has been examined by Cochran (1955: 287). Güntert et al. (1993: 155) mention 7 syntypes in NMBE.
Present name: *Hylodes lateristrigatus* (Baumann, 1912) fide Frost (2004).

Eupemphix paraensis Müller, 1923

Zool. Anz. 57: 38 [in the journal] respectively 39 [in the reprint]

Holotype: ZSM 139/1911 (lost), female, "Peixeboi (an der Bragançabahn), Staat Parà, Nord-Brasilien", coll. L. Müller, 05.1910.
Present name: *Physalaemus petersi* (Jiménez de la Espada, 1872) according to Lynch (1970).

Hemiphractus fasciatus Peters, 1862

Monatsber. Preuss. Akad. Wiss. Berlin 1862: 149

Holotype: ZSM 36/0, adult, "Pastassa-Thal an der Ostseite der Anden in Ecuador" [Ecuador, Pastaza valley] (according to the original description), coll. M. Wagner, no date.
Remarks: Type locality erroneous according to Trueb (1974). Very recently, *Hemiphractus* was removed from the family Hylidae and included in the family Leptodactylidae by Faivovich et al. (2005).

Hemiphractus Spixii Wagler, 1828

Isis (Oken) 21: 744

Holotype: ZSM 37/0 (lost), "Habitat in sylvis fluvii Solimoëns" [Brazil, Rio Solimões] (according to Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Also holotype of *Rana scutata* Spix, 1824. Very recently, *Hemiphractus* was removed from the family Hylidae and included in the family Leptodactylidae by Faivovich et al. (2005).
Present name: *Hemiphractus scutatus* (Spix, 1824) according Wagler (1830: 205) and Trueb (1974).

Fig. 16. *Leptodactylus dominicensis* Müller, 1923 (now *Leptodactylus fallax* Müller, 1926), holotype (ZSM 258/1909). This is a very large frog, endemic to a few Caribbean islands. The species is critically endangered, since it is consumed by humans, suffers from habitat destruction and the outbreak of the fungal disease chytridiomycosis.

Hyla abbreviata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 41

Type(s): Status unclear, perhaps holotype, uncatalogued (lost), "Habitat in sylvis fluminis Amazonum" [Brazil, Rio Amazonas; probably erroneous] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Eleutherodactylus binotatus* (Spix, 1824) fide Frost (2004).

Hyla ranoides Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 32

Syntypes: ZSM 1043/0 (lost), 3 specimens, "Habitat in Provincia Bahiae" [Brazil, former province of Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: This taxon is a composite. Two specimens refer to *Hylodes nasus* (Lichtenstein, 1823) and one specimen [pl. 6, fig. 3] of the original description is probably an *Eleutherodactylus* or *Thoropa miliaris* (fide Hoogmoed & Gruber 1983).

Leptodactylus andreae Müller, 1923

Zool. Anz. 57: 40 [in the journal] respectively 41 [in the reprint]

Holotype: ZSM 136/1911 (lost), male, "Peixeboi (a.d. Bragançabahn), Staat Parà, Brasilien", coll. L. Müller, 05.1910.
Neotype: ZSM 145/1911/4, juvenile female, "Peixeboi (a.d. Bragançabahn), Staat Parà, Brasilien" (label), coll. L. Müller, 05.1910.
Paratypes: ZSM 146/1911 (lost), 2 females, "Utinga b. Bélem (Parà), Brasil." (catalogue), coll. L. Müller. 25.12.1909; ZSM 145/1911/1-3, 3 specimens, "Peixeboi (a.d. Bragançabahn), Staat Parà, Brasilien" (label), coll. L. Müller, 05.1910.
Remarks: Heyer (1973: 27-28) designated ZSM 145/1911/4 as a lectotype which however actually appears to be a neotype designation since the original description is based on a type and cotypes ("Typusexemplar" and "Cotypen"). Heyer (1973) himself stated that the holotype was lost.
Present name: *Adenomera andreae* according to Heyer (1974: 42, see also Angulo et al. 2003 for comments).

Leptodactylus dominicensis **Müller, 1923**

Zool. Anz. 57: 49 [in the journal], respectively 43 [in the reprint]

Holotype: ZSM 258/1909, female, "Dominica", coll. Othmer, 1903.
Paratype: ZSM 259/1909, female, same data as holotype.
Remarks: A redescription of the types, the taxonomic history and information on the reproductive mode are provided by Lescure (1979).
Present name: *Leptodactylus fallax* Müller, 1926, which is a replacement name for *Leptodactylus dominicensis.*

Leptodactylus fallax **Müller, 1926**

see *Leptodactylus dominicensis* Müller, 1923

Leptodactylus nanus **Müller, 1922**

Bl. Aquar.-Terrarienkunde 33: 168

Lectotype: ZSM 661/1920/3, female, "Colonie Hansa, Flußgebiet des Itapocuflusses, Brasilien" (label), coll. W. Ehrhardt, 1919.
Paralectotypes: ZSM 661/1920/1-2, 2 specimens, same data as lectotype; ZSM 659/1920 (lost), 1 specimen, "Humboldt, Flussgebiet des Rio novo, Brasilien" (card index, original description), coll. W. Ehrhardt, 1919; ZSM 660/1920 (lost), 3 specimens, same data as ZSM 659/1920.
Remarks: Lectotype designated by Heyer (1973: 27). The number of syntypes and their corresponding numbers is not given in the original description. We here follow Heyer (1973) who considered the three specimens ZSM 661/1920 as types. According to the catalogue ZSM 659/1920 (1 specimen) was considered as holotype ("Typus"). ZSM 660/1920 (4 specimens) and ZSM 661/1920 (3 specimens) were considered as paratypes ("Cotypen"). One of the four "cotypes" under ZSM 660/1920 was exchanged with the British Museum in 1930.

According to the original description, all specimens came from the general region of the Rio Novo ("Flussgebiet des Rio novo, Sta Catharina, Brasilien"). According to the catalogue ZSM 659/1920 and 660/1920 are from another locality than ZSM 661/1920 (see above). However, according to Bokermann (1966) both names ("Humboldt" and "Hansa") refer to the same locality (today named Corupá, at the confluent of the Rio Novo and Japucu).
Present name: *Adenomera marmorata* (Steindachner, 1867) according to Heyer (1974: 43).

Paludicola bresslaui **Müller, 1924**

Senckenbergiana 6: 175

Holotype: ZSM 4/1924 (lost), female, "Therezopolis (in der Serra dos Orgaes), Staat Rio de Janeiro" [Brazil], coll. E. Bresslau, 04.1924.
Present name: *Physalaemus signifer* (Girard, 1853) according to Cochran (1955: 354).

Paludicola fernandezae **Müller, 1926**

Zool. Anz. 65: 193

Holotype: ZSM 137/1925 (lost), male, "Christiano muerto (zwischen Neochaea und Bahia Blanca), Prov. Buenos Aires, Argentinien", coll. Merkle, 07. 1921.
Remarks: Additional eight specimens are listed in the catalogue as paratypes under the number ZSM 222/1925. However, they are not mentioned in the original description and are all lost.
Present name: *Physalaemus fernandezae* (Müller, 1926) according to Cei (1980: 406-409).

Paludicola kriegi **Müller, 1926**

Zool. Anz. 65: 194

Holotype: ZSM 138/1925 (lost), female, "Fuß der Sierra Grande von Cordoba, Provinz Cordoba, Argentinien", coll. H. Krieg, 1924.
Present name: *Pleurodema kriegi* (Müller, 1926) according to Cei (1980: 374-376).

Phyllobates chalceus **Peters, 1873**

Mber. Königl. Akad. Wiss. Berlin, 1873 (Oktober): 609

Syntypes: ZSM 1045/0 (lost), 2 specimens, "Pastassathal" [Pastaza valley, Ecuador], coll. M. Wagner, no date.
Remarks: In the original description three (type) specimens are mentioned, but only two listed in the ZSM catalogue. The third specimen is apparently ZMB 7814 according to Bauer et al. (1995: 46).
Present name: *Eleutherodactylus chalceus* (Peters, 1873), see account in Lynch & Duellman (1997: 79-81).

Plectromantis Wagneri **Peters, 1862**

Monatsber. Königl. Akad. Wiss. Berlin, 1862 (April): 232

Holotype: ZSM 1080/0 (lost), adult, "an der Westseite der Anden in Ecuador" (original description), "Pastassathal" [Pastaza, Ecuador] (catalogue), coll. M. Wagner, no date.
Remarks: Neotype designation (NHRM unnumbered, holotype of *Eleutherodactylus leptodactyloides*)

Fig. 17. *Rana megastoma* Spix, 1824, lectotype (ZSM 1056/0), a synonym of *Ceratophrys cornuta*.

by Heyer (1970: 19) considered to be invalid by Heyer (1994: 78).
Present name: *Leptodactylus wagneri* (Peters, 1862) according to Heyer (1970, 1994).

Rana binotata Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 31

Holotype: ZSM 2695/0, female, no locality data given in the original description, but Brazil by implication, coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Eleutherodactylus binotatus* (Spix, 1824) fide Hoogmoed & Gruber (1983).

Rana coriacea Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 29

Holotype: ZSM 2502/0 (lost), male, "Habitat in aquis lacustribus fluvii Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Leptodactylus pentadactylus* (Laurenti, 1768) fide Hoogmoed & Gruber (1983).

Rana gigas Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 25

Holotype: ZSM 89/1921 (lost), female, "Habitat in locis paludosis fluminis Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Leptodactylus pentadactylus* (Laurenti, 1768) fide Hoogmoed & Gruber (1983).

Rana labyrinthica Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 31

Holotype: ZSM 2501/0 (lost), "Habitat in Provincia Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Bokermann (1966: 89) considered the type

locality to be in error and instead suggested that it was more probably "Paraíba, já próximo da divisa com São Paulo", Brazil (see also Frost 2004).
Present name: *Leptodactylus labyrinthicus* (Spix, 1824) fide Hoogmoed & Gruber (1983).

Rana megastoma Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 27

Lectotype: ZSM 1056/0, female, "Habitat [...] in Brasiliae sylvis sub arboribus cavis. Specimen depictum juxta flumen Solimoens prope pagum Avalëns repertum est" [Brazil, at Rio Solimões near Amaturá (03°29'S, 68°06'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: Uncatalogued, same data as lectotype, presumably lost between 1872 and the early 20th century (Hoogmoed & Gruber 1983).
Remarks: Peters (1872) identified the two former syntypes as *Ceratophrys cornuta* and *C. dorsata* (see Hoogmoed & Gruber 1983).
Present name: *Ceratophrys cornuta* (Linnaeus, 1758) according to Peters (1872) and Hoogmoed & Gruber (1983).

Rana miliaris Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 30

Holotype: ZSM 2493/0 (lost), "Habitat ad ripam fluminis Amazonum" [Brazil, Rio Amazonas; erroneous, see Hoogmoed & Gruber 1983] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Bokermann (1966: 89) and Hoogmoed & Gruber (1983) considered the type locality to be in error.
Present name: *Thoropa miliaris* (Spix, 1824) fide Hoogmoed & Gruber (1983).

Rana mystacea Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 27

Lectotype: ZSM 2504/0 (lost), male, "prope flumen Solimoens" [Brazil, Rio Solimões] (according to the catalogue, see also Hoogmoed & Gruber 1983), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: ZSM 2505/0 (lost), female, "Bahia" [Brazil, city of Salvador (13°00'S, 38°30'W)] (according to the catalogue, see also Hoogmoed & Gruber 1983), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The paralectotype belongs to *Leptodactylus spixi* Heyer, 1983.
Present name: *Leptodactylus mystaceus* (Spix, 1824) fide Hoogmoed & Gruber (1983).

Rana pachypus Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 26

Lectotype: ZSM 122/0/1 (ZSMH 122/0 A in Hoogmoed & Gruber 1983), male, "Habitat in locis humidis Provinciae Rio de Janeiro" [Brazil, state of Rio de Janeiro] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Paralectotype: ZSM 122/0/2 (ZSMH 122/0 B in Hoogmoed & Gruber 1983), female, same data as lectotype; ZSM 117/0 (lost), same data as lectotype.
Remarks: In the original description (Spix 1824, pl. 3, fig. 2) the species is figured under the name *Rana pagypus*. Of the ten specimens mentioned in the original description, only two, a male and a female are still extant (Hoogmoed & Gruber 1983). Frost (2004) erroneously mentioned ZMH 122/0-A as lectotype.
Present name: *Leptodactylus ocellatus* (Linnaeus, 1758) fide Hoogmoed & Gruber (1983).

Rana pachypus Variet. 1 Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 26

Holotype: ZSM 2503/0 (lost), juvenile, "Habitat in locis humidis Bahiae" [Brazil, city of Salvador (13°00'S, 38°30'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The nomenclatural availability of this taxon appears to be questionable. It could be considered as a homonym of *Rana pachypus*.
Present name: *Leptodactylus ocellatus* (Linnaeus, 1758) fide Hoogmoed & Gruber (1983).

Rana pachypus Variet. 2 Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 26

Holotype: Uncatalogued (lost), "Habitat in locis aquosis Parae" [Brazil, probably Belém (01°26'S, 48°29'W)] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The nomenclatural availability of this taxon appears to be questionable. It could be considered as a homonym of *Rana pachypus*.
Present name: *Leptodactylus fuscus* (Schneider, 1799) according to Peters (1872) and Hoogmoed & Gruber (1983).

Rana pygmaea Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 30

Holotype (?): Uncatalogued (lost), juvenile, "Habitat in Provincia Bahiae" [Brazil, former province of

Bahia, part of the present state of Bahia] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Present name: *Leptodactylus ocellatus* (Linnaeus, 1758) fide Hoogmoed & Gruber (1983).

***Rana scutata* Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 28

Holotype: ZSM 37/0 (lost), "Habitat in sylvis fluvii Solimoëns" [Brazil, Rio Solimões] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: Also holotype of *Hemiphractus spixii* Wagler, 1828. Very recently, *Hemiphractus* was removed from the family Hylidae and included in the family Leptodactylidae by Faivovich et al. (2005).
Present name: *Hemiphractus scutatus* (Spix, 1824) according to Wagler (1830: 205) and Trueb (1974).

Mantellidae Laurent, 1946

***Aglyptodactylus laticeps* Glaw, Vences & Böhme, 1998**

J. Zool. Syst. Evol. Res. 36: 18

Paratype: ZSM 581/1999 (originally ZFMK 59971), adult male, "Kirindy forest (20'03'S, 44°39'E; at less than 100 m above sea level), western Madagascar", coll. F. Glaw, 21.01.1995.
Remarks: Holotype and 7 paratypes in ZFMK.

***Aglyptodactylus securifer* Glaw, Vences & Böhme, 1998**

J. Zool. Syst. Evol. Res. 36: 27

Paratype: ZSM 46/2005 (originally ZFMK 59976), adult (cleared and stained), "Kirindy forest (20'03'S, 44°39'E; at less than 100 m above sea level), about 60 km north of Morondava, western Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 06.01.1995.
Remarks: Holotype in ZFMK.

***Boophis albilabris occidentalis* Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 90

Paratype: ZSM 559/1999 (originally ZFMK 57384), subadult male (?), "Isalo National Park (Namazaha valley, forest ca. 4 km W of Ranohira, western central Madagascar)", coll. F. Glaw & M. Vences, 29.01.1994.
Remarks: Holotype in ZFMK.
Present name: *Boophis occidentalis* Glaw & Vences, 1994 according to Andreone et al. (2002).

***Boophis albipunctatus sibilans* Glaw & Thiesmeier, 1993**

Salamandra 28 (3/4): 264

Paratype: ZSM 560/1999 (originally ZFMK 53619), subadult (?), "Andasibe" [Madagascar], coll. F. Glaw, 11.01.1992.
Remarks: Holotype in ZFMK.
Present name: *Boophis sibilans* Glaw & Thiesmeier, 1993 according to Glaw & Vences (1994).

***Boophis andreonei* Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 96

Paratype: ZSM 561/1999 (originally ZFMK 57392), male, "Benavony (near Ambanja, NW-Madagascar)", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 08.03.1994.
Remarks: Holotype and one paratype in ZFMK.

***Boophis axelmeyeri* Vences, Andreone & Vietes, 2005**

Trop. Zool. 18: 239

Holotype: ZSM 627/2001, adult male, "Manarikoba forest, Camp I (Antsahamanara), Tsaratanana Massif, Marovato Fivondronana, Antsiranana Faritany (Diégo Suarez Province), northwestern Madagascar, 14°02'42"S, 48°47'04"E, ca 1000 m above sea level", coll. F. Andreone, F. Mattioli, J. Randrianirina & M. Vences, 03.02.2001.
Paratypes: Six adult males. ZSM 626/2001, same collection data as holotype; ZSM 628-631/2001, same collecting data as holotype except later collecting date (04-09.02.2001); ZSM 837/2003, "Manongarivo Special Reserve, northwestern Madagascar, 13°58' 32"S, 48°25'36"E, 688 m", coll. F. Glaw, R.-D. Randrianiaina & M. Vences on 02.02.2003.
Remarks: Nine further paratypes in MRSN.

***Boophis blommersae* Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 103

Paratype: ZSM 562/1999 (originally ZFMK 57400), male, "Montagne d'Ambre National Park, N-Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 14.-17.03.1994.
Remarks: Holotype and one paratype in ZFMK.

***Boophis boehmei* Glaw & Vences, 1992**

Fieldguide Amph. Rept. Madagascar: 273

Paratype: ZSM 563/1999 (originally ZFMK 53643), male, "Andasibe" [Madagascar], coll. F. Glaw & J. Müller, 11.01.1992.
Remarks: Holotype and three paratypes in ZFMK.

Boophis bottae **Vences & Glaw, 2002**

Trop. Zool. 15: 150

Holotype: ZSM 678/2001, adult male, "close to Andasibe (at a bridge on the road between National Road 2 and the Andasibe village), central-eastern Madagascar, 18°56'S, 48°25'E, ca. 900 m elevation", coll. M. Vences & D. Vieites, 16.02.2001.
Paratype: ZSM 344/2000, adult male, same locality as holotype, coll. F. Glaw & M. Vences, 09.02.2000.
Remarks: Paratype ZSM 679/2001 has been exchanged (now ZMA 20334). Remaining paratypes in ZFMK and UADBA.

Boophis burgeri **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 107

Paratype: ZSM 564/1999 (originally ZFMK 57406), male, "Andasibe, CE-Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 24.-28.02.1994.
Remarks: Holotype and one paratype in ZFMK.

Boophis englaenderi **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 93

Paratype: ZSM 565/1999 (originally ZFMK 57389), male, "Marojezy massif at low altitude, NE-Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 29.03.1994.
Remarks: Holotype and one paratype in ZFMK.

Boophis feonnyala **Glaw, Vences, Andreone & Vallan, 2001**

Zool. J. Linn. Soc. 133 (4): 520

Holotype: ZSM 585/1999 (originally ZFMK 60003), adult male, "Andasibe (18°56'S; 48°25'E, about 900 m above sea level), central eastern Madagascar", coll. F. Glaw & D. Vallan, 01.04.1995.
Remarks: Three paratypes, all in ZFMK.

Boophis haematopus **Glaw, Vences, Andreone & Vallan, 2001**

Zool. J. Linn. Soc. 133 (4): 515

Holotype: ZSM 583/1999 (originally ZFMK 53632), adult male, "Nahampoana southeastern Madagascar", coll. F. Glaw & J. Müller, 04.01.1992.
Remarks: Six paratypes in MRSN (4) and ZFMK (2).

Boophis liami **Vallan, Vences & Glaw, 2003**

Amphibia-Reptilia 24: 307

Paratypes: ZSM 310-311/2000, 2 adult males, "Vohidrazana (18°57'57"S, 48°30'37"E, 731 m elevation)" [central-eastern Madagascar], coll. F. Glaw, 10.04. 2000; ZSM 673/2001, adult male, "Vohidrazana (18°57'58"S, 48°30'35"E, 810 m elevation)" [central-eastern Madagascar], coll. M. Vences, D. R. Vieites & F. Mattioli, 17.02.2001.
Remarks: Paratype ZSM 674/2001 has been exchanged (now ZMA 20333). Holotype in ZFMK, further paratypes in NMBE, UADBA and ZFMK.

Boophis luteus septentrionalis **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 92

Paratype: ZSM 566/1999 (originally ZFMK 57387), female, "Montagne d'Ambre National Park, N-Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 21.03.1994.
Remarks: Holotype and one paratype in ZFMK.
Present name: *Boophis septentrionalis* Glaw & Vences, 1994 according to Andreone (1996) and Andreone & Randriamahazo (1997).

Boophis mandraka **Blommers-Schlösser, 1979**

Bijdr. Dierk. 49 (2): 267

Paratype: ZSM 359/2004 (originally ZMA 7119B), male, "Madagascar [...] Mandraka valley (highroad R.N. 2 at km 67), alt. 1200 m", coll. R. M. A. Blommers-Schlösser, 04.03.1973.

Boophis marojezensis **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 104

Paratype: ZSM 567/1999 (originally ZFMK 57402), male, "Marojezy massif at low altitude, NE-Madagascar ", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 27.03.1994.
Remarks: Holotype in ZFMK.

Boophis picturatus **Glaw, Vences, Andreone & Vallan, 2001**

Zool. J. Linn. Soc. 133 (4): 518

Holotype: ZSM 584/1999 (originally ZFMK 60078), adult male, "An'Ala (about 840 m above sea level), central eastern Madagascar", coll. F. Glaw, 11.02. 1995.
Remarks: Five paratypes, all in ZFMK.

Boophis pyrrhus **Glaw, Vences, Andreone & Vallan, 2001**

Zool. J. Linn. Soc. 133 (4): 513

Holotype: ZSM 582/1999 (originally ZFMK 53634), adult male, "Andasibe (18°56'S; 48°25'E, about 900 m above sea level), central eastern Madagascar", coll. F. Glaw & J. Müller, 09.01.1992.

Fig. 18. *Boophis picturatus* Glaw, Vences, Andreone & Vallan, 2001, holotype (ZSM 584/1999). This is one of the many new frog species of the family Mantellidae which were recently discovered in Madagascar.

Remarks: 11 paratypes in MRSN (1), ZFMK (3) and ZMA (7).

Boophis reticulatus Blommers-Schlösser, 1979

Bijdr. Dierk. 49 (2): 294

Paratype: ZSM 360/2004 (originally ZMA 7101B), male, "Madagascar […] near Perinet (highroad R.N. 2 at km 142), alt. 1100 m", coll. R. M. A. Blommers-Schlösser, 13.11.1972.

Boophis rufioculis Glaw & Vences, 1997

Salamandra 32 (4): 228

Paratype: ZSM 568/1999 (originally ZFMK 60081), adult male, "Regenwald bei An'Ala (zur Kolonialzeit Haltestelle "La foret" der Eisenbahn), etwa 9 km östlich von Andasibe (= Perinet), östliches Zentral-Madagaskar, ca. 840 m über NN", coll. F. Glaw, 11.02. 1995.
Remarks: Holotype and three paratypes in ZFMK.

Boophis sambirano Vences & Glaw, 2005

African J. Herpetol. 54 (1): 79

Holotype: ZSM 811/2003, adult male, "small settlement called 'Camp Norbert' by our guides, 13°56' 53"S, 48°27'28"E, ca. 280 m above sea level, Manongarivo Special Reserve, northwestern Madagascar", coll. F. Glaw, M. Vences & R.-D. Randrianiaina, 31.01. 2003.
Paratypes: ZSM 810/2003, adult male, same collecting data as holotype; ZSM 995-996/2003, 2 adult males, same collectors and same locality as holotype, 05.02.2003; ZSM 815/2003, "undetermined site several kilometres upstream from the type locality", same collectors as holotype, 01.02.2003.

Boophis schuboeae Glaw & Vences, 2002

Spixiana 25 (2): 174

Paratype: ZSM 1086/2001 (originally ZFMK 62285), adult male, "Vohiparara (Ranomafana National Park, at ca. 1000 m above sea level), south eastern Madagascar", coll. F. Glaw, D. Rakotomalala & F. Ranaivojaona, 28.02.1996.
Remarks: Holotype and two paratypes in ZFMK.

Boophis solomaso **Vallan, Vences & Glaw, 2003**

Amphibia-Reptilia 24: 311

Paratype: ZSM 47/2005 (originally NMBE 1046008), adult male, "site called Analambalotra near Ambavaniasy, 18°57'36"S, 48°30'00"E, about 880 m elevation, Moramanga Fivondronana, Toamasina Province, central eastern Madagascar", coll. D. Vallan, 10.02.1997.
Remarks: Holotype in NMBE.

Boophis tasymena **Vences & Glaw, 2002**

Trop. Zool. 15: 150

Holotype: ZSM 1085/2001 (originally ZFMK 62224), adult male, "Andasibe, central-eastern Madagascar, 18°56'S, 48°25'E, ca. 900 m elevation", coll. F. Glaw 04.02.1996.
Remarks: Six paratypes, all in ZFMK.

Boophis viridis **Blommers-Schlösser, 1979**

Bijdr. Dierk. 49 (2): 272

Paratype: ZSM 361/2004 (originally ZMA 7100B), male, "Madagascar [...] near Perinet (highroad R. N. 2 at km 142), alt. 900 m", coll. R. M. A. Blommers-Schlösser, 14.11.1972.

Boophis vittatus **Glaw, Vences, Andreone & Vallan, 2001**

Zool. J. Linn. Soc. 133 (4): 522

Holotype: ZSM 586/1999 (originally ZFMK 59889), adult male, "Reserve Integrale Marojezy, Camp 3, about 700 m above sea level, northeastern Madagascar", coll. F. Glaw & O. Ramilison, 01.03.1995.
Remarks: Five paratypes, all in ZFMK.

Boophis xerophilus **Glaw & Vences, 1997**

Copeia 1997 (3): 572

Paratype: ZSM 569/1999 (originally ZFMK 59989), adult male, "Kirindy forest (20'03'S, 44°39'E; below 100 m above sea level), about 60 km north of Morondava, western Madagascar", coll. F. Glaw, 21.01. 1995.
Remarks: Holotype and two paratypes in ZFMK.

Mantella crocea **Pintak & Böhme, 1990**

Salamandra 26 (1): 58

Paratype: ZSM 570/1999 (originally ZFMK 45008), male, "Andasibé (= Périnet), mittleres Ostmadagaskar", coll. native collector, 1986.
Remarks: Holotype and numerous paratypes in ZFMK (see Vences et al. 1999).

Mantella expectata **Busse & Böhme, 1992**

Rev. fr. Aquariol. 19 (1/2): 58

Paratype: ZSM 571/1999 (originally ZFMK 53541), 1 specimen, "20 km southeast of Toliara (= Tulear), W-Madagascar", coll. G. Gottlebe, 1991.
Remarks: Holotype and five paratypes in ZFMK (see Vences et al. 1999).

Mantella madagascariensis haraldmeieri **Busse, 1981**

Amphibia-Reptilia 2: 34

Paratype: ZSM 572/1999 (originally ZFMK 21807), 1 specimen, "Fort Dauphin, Süd-Madagaskar", coll. H. Meier, 1978.
Remarks: Holotype and three paratypes in ZFMK.
Present name: *Mantella haraldmeieri* Busse, 1981 according to Vences et al. (1999).

Mantidactylus ambohitra **Vences & Glaw, 2001**

Alytes 19 (2-4): 120

Holotype: ZSM 1084/2001 (originally ZFMK 57418), adult male, "Montagne d'Ambre" [northern Madagascar], coll. F. Glaw, N. Rabibisoa & O. Ramilison, 14.-17.03.1994.
Remarks: Paratypes in MNHN, MTD and ZFMK.

Mantidactylus charlotteae **Vences & Glaw, 2004**

J. Nat. Hist. 38 (1): 101

Paratype: ZSM 934/2000 (originally ZFMK 47219), adult, "Nosy Mangabe" [Madagascar], coll. F. Glaw, 24.-25.10.1987.
Remarks: Holotype in ZMA.

Mantidactylus cornutus **Glaw & Vences, 1992**

Fieldguide Amph. Rept. Madagascar: 272

Paratype: ZSM 573/1999 (originally ZFMK 53690), male, "Andasibe" [Madagascar], coll. F. Glaw & J. Müller, 11.01.1992.
Remarks: Holotype and three paratypes in ZFMK.

Mantidactylus corvus **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 146

Paratype: ZSM 574/1999 (originally ZFMK 57431), male, "Isalo National Park (Namazaha valley, forest ca. 4 km W of Ranohira), western central Madagascar", coll. F. Glaw & M. Vences, 29.01.1994.
Remarks: Holotype in ZFMK.

Mantidactylusi enki **Glaw & Vences, 2002**

Amphibia-Reptilia 23: 294

Paratype: ZSM 1083/2001 (originally ZFMK 62274), adult male, "Vohiparara (close to Ranomafana), south-eastern Madagascar, 21°13'S, 47°22'E, at ca. 1050 m above sea level", coll. F. Glaw, D. Rakotomalala & F. Ranaivojaona, 03.-04.03.1996.
Remarks: Holotype and one paratype in ZFMK.

Mantidactylus fimbriatus **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 142

Paratype: ZSM 575/1999 (originally ZFMK 57440), male, "Andasibe, CE-Madagascar", coll. F. Glaw & M. Vences, 01.01.1994.
Remarks: Holotype in ZFMK.

Mantidactylus flavobrunneus **Blommers-Schlösser, 1979**

Beaufortia 29 (352): 54

Paratype: ZSM 362/2004 (originally ZMA 7172), female, "Madagascar [...] along the road from Moramanga to Anosibe at km 25, alt. 900 m", coll. R. M. A. Blommers-Schlösser, 25.08.1971.

Mantidactylus kathrinae **Glaw, Vences & Gossmann, 2000**

J. Nat. Hist. 34: 1136

Paratype: ZSM 576/1999 (originally ZFMK 62263), adult male, "rainforest near An'Ala (18°56'S, 48°28'E, 840 m above sea level), eastern Madagascar", coll. F. Glaw, 03.02.1996.
Remarks: Holotype and one paratype in ZFMK.

Mantidactylus madinika **Vences, Andreone, Glaw & Mattioli, 2002**

Copeia 2002 (4): 1058

Holotype: ZSM 601/2001, adult male, "a plantation at the edge of the Sambirano River, approximately 200 m upstream from Antsirasira (on the river side opposite to the larger village of Marovato), Marovato Fivondronana, Antsiranana Faritany (Diégo Suarez Province), north-western Madagascar (13°56' 22"S, 48°33'16"E, less than 100 m above sea level)", coll. M. Vences, F. Andreone, F. Mattioli & J. E. Randrianirina, 30.01.2001.
Paratypes: ZSM 600/2001, adult female, same locality and collecting data as holotype; ZSM 604/2001-607/2001, 3 adult males, 1 adult female, from the type locality, coll. M. Vences, 12.02.2001.
Remarks: One further paratype in MRSN. The paratypes ZSM 602/2001 (now ZFMK 76103) and ZSM 603/2001 (now ZMA 20331) have been exchanged.

Mantidactylus massi **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 143

Paratype: ZSM 577/1999 (originally ZFMK 57443), male, "Benavony (near Ambanja, NW-Madagascar)", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 08.03. 1994.
Remarks: Holotype in ZFMK.
Present name: *Mantidactylus massorum* Glaw & Vences, 1994 according to Michels & Bauer (2004).

Mantidactylus moseri **Glaw & Vences, 2002**

J. Herpetol. 36 (3): 373

Holotype: ZSM 935/2000 (originally ZFMK 60024), adult male, "Andasibe (18°55'3"S, 48°25'22"E; approximately 850 m above sea level)" [central-eastern Madagascar], coll. F. Glaw & N. Rabibisoa, 18.12. 1994.
Remarks: Two paratypes in ZFMK.

Mantidactylus phantasticus **Glaw & Vences, 1997**

Salamandra 32 (4): 246

Paratype: ZSM 578/1999 (originally ZFMK 62208), adult male, "Regenwald bei Andasibe (= Perinet), ca. 900 m über NN", coll. F. Glaw, D. Rakotomalala & F. Ranaivojaona, 09.03.1996.
Remarks: Holotype and one paratype in ZFMK.

Mantidactylus punctatus **Blommers-Schlösser, 1979**

Beaufortia 29 (352): 51

Paratype: ZSM 363/2004 (originally ZMA 7170), adult, "Madagascar [...] Tampoketsa d'Ankazobe, forest station ('highroad R.N. 4' Tananarive-Majunga), alt. 1600 m", coll. R. M. A. Blommers-Schlösser, 12.09.1971.

Mantidactylus rivicola **Vences, Glaw & Andreone, 1997**

Alytes 14 (4): 138

Paratype: ZSM 579/1999 (originally ZFMK 59898), male, "near Camp 1, Marojezy Strict Nature Reserve (Réserve Naturelle Intégrale), northeastern Madagascar, altitude about 300 m above sea level", coll. F. Glaw & O. Ramilison, 25.-28.02.1995.
Remarks: Holotype and 4 paratypes in ZFMK.

Mantidactylus sarotra **Glaw & Vences, 2002**

Herpetol. J. 12: 14

Holotype: ZSM 351/2000, adult male, "Mandraka (18°54'44"S, 47°54'52"E, 1425 m altitude), central eastern Madagascar", coll. F. Glaw & M. Vences, 08. 02.2000.
Paratype: ZSM 354/2000, adult male, same data as holotype.
Remarks: 2 paratypes in UADBA and ZFMK.

Mantidactylus schilfi **Glaw & Vences, 2000**

Spixiana 23 (1): 74

Paratype: ZSM 587/1999 (originally ZFMK 59886), male, "Réserve Naturelle Intégrale Marojezy, Camp 4 (ca. 1250 m above sea level), northeastern Madagascar", coll. F. Glaw & O. Ramilison, 28.02.1995.
Remarks: Holotype in ZFMK, one paratype in UADBA and one paratype in MNHN.

Mantidactylus striatus **Vences, Glaw, Andreone, Jesu & Schimmenti, 2002**

Contrib. Zool. 70 (4): 203

Holotype: ZSM 938/2000 (originally ZFMK 57436), adult male, "Marojejy massif, Campsite 1 (ca. 300 m altitude)", [north-eastern Madagascar], coll. F. Glaw, N. Rabibisoa & O. Ramilison, 27.-31.03.1994.
Remarks: Paratypes in MRSN and ZFMK.

Mantidactylus tandroka **Glaw & Vences, 2001**

Spixiana 24 (2): 185

Paratype: ZSM 937/2000 (originally ZFMK 59895), female, "Marojezy, Campsite 4 (ca. 1300 m altitude)", coll. F. Glaw & O. Ramilison, 28.02.1995.
Remarks: Holotype and 7 paratypes in MNHN, 1 paratype in ZFMK.

Mantidactylus thelenae **Glaw & Vences, 1994**

Fieldguide Amph. Rept. Madagascar, 2nd ed.: 156

Paratype: ZSM 580/1999 (originally ZFMK 57425), male, "Andasibe, CE-Madagascar", coll. F. Glaw, N. Rabibisoa & O. Ramilison, 26.-28.02.1994.
Remarks: Holotype and two paratypes in ZFMK.

Mantidactylus timidus **Vences & Glaw, 2005**

Herpetol. J. 15: 40

Paratype: ZSM 364/2004 (originally ZMA 19492), male, "less than 10 km north of Toamasina, eastern Madagascar (18°03'51"S, 49°22'39"E, 8 m above sea level), coll. M. Vences, 10.02.2003.
Remarks: Holotype in ZSM.

Mantidactylus tschenki **Glaw & Vences, 2001**

Spixiana 24 (2): 181

Holotype: ZSM 936/2000 (originally ZFMK 62298), adult male, "along the road between Ambatolahy and Ranomafana, south-eastern Madagascar", coll. F. Glaw, D. Rakotomalala & F. Ranaivojaona, 28.2. 1996.
Remarks: Two paratypes in ZFMK and one in MRSN.

Mantidactylus zavona **Vences, Andreone, Glaw & Randrianirina, 2003**

African Zool. 38 (1): 71

Holotype: ZSM 648/2001, adult male, "Antsahamanara (14°02'42"S / 48°47'04"E; c. 1100 m above sea level) in the Manarikoba forest, Réserve Naturelle Intégrale de Tsaratanana, central northern Madagascar", coll. M. Vences, F. Andreone, F. Mattioli & J. Randrianirina, 02.02.2001.
Paratype: ZSM 649/2001, adult male, same locality as holotype, coll. M. Vences, F. Andreone, F. Mattioli & J. Randrianirina, 02.-13.02.2001.
Remarks: The paratypes ZSM 647/2001 (now ZFMK 76104) and ZSM 650/2001 (now ZMA 20332) have been exchanged. Further paratypes in MRSN, MSNG and UADBA.

Mantidactylus zipperi **Vences & Glaw, 2004**

J. Nat. Hist. 38 (1): 97

Paratype: ZSM 1216/2001 (originally ZFMK 60091), adult male, "An'Ala, eastern Madagascar (18°56'S, 48°28'E, 840 m above sea level)" [erroneously stated as 180°56'S in the original description], coll. F. Glaw, 11.-12.02.1995.
Remarks: Holotype in ZFMK.

Mantidactylus zolitschka **Glaw & Vences, 2004**

Spixiana 27 (1): 87

Paratypes: ZSM 939/2000 (originally ZFMK 60111), adult male, "rainforest near An'Ala (18°56'S, 48°28'E, 840 m above sea level), eastern Madagascar", coll. F. Glaw & D. Vallan, 21.03.1995; ZSM 184/2003, female, same locality as holotype, coll. G. Aprea, F. Glaw, M. Puente, L. Raharivololoniaina, R. D. Randrianiaina & M. Thomas, 02.03.2003.
Remarks: Holotype and five paratypes in ZFMK.

Microhylidae Günther, 1858

Anodonthyla moramora Glaw & Vences, 2005

Spixiana 28 (2): 183

Holotype: ZSM 744/2003, adult male, "next to Kidonafo bridge, Vohiparara near Ranomafana, south-eastern Madagascar (21°13'S, 47°22'E, ca. 1000 m above sea level)", coll. F. Glaw, M. Puente, M. Thomas, L. Raharivololoniaina & D. R. Vieites, 20.01. 2003.
Paratypes: ZSM 705-706/2003, 2 adult males, same collecting data as holotype.

Anodonthyla nigrigularis Glaw & Vences, 1992

Fieldguide Amph. Rept. Madagascar: 273

Paratype: ZSM 553/1999 (originally ZFMK 53746), male, "Nahampoana", Madagascar, coll. F. Glaw & J. Müller, 04.01.1992.
Remarks: Holotype and two paratypes in ZFMK.

Austrochaperina derongo Zweifel, 2000

Bull. Amer. Mus. Nat. Hist. 253: 27

Paratype: ZSM 109/1999, "Papua New Guinea [. . .] Southern Highlands Prov. [. . .], at Didessa, north slope of Mt. Bosavi", coll. T. Schultze-Westrum, 09.1966.

Breviceps mossambicus var. *occidentalis* Werner, 1903

Abh. K. Bayer. Akad. Wiss. II. Kl. 22: 383

Type status unclear: uncatalogued (lost), 1 specimen (?), "Deutsch-Südwestafrika" [Namibia], coll. Kuhn, no date.
Present name: *Breviceps adspersus* Peters, 1882 according to Parker (1931: 193). Frost (2004) erroneously listed this taxon as *Breviceps mossambicus* var. *mossambicus* (sic) in the synonymy of *Breviceps mossambicus* which however does not occur in Namibia.

Cophyla berara Vences, Andreone & Glaw, 2005

African Zool. 40 (1): 144

Holotype: ZSM 410/2000, adult male, "site locally called Berara, located within Anabohazo forest, Sahamalaza Peninsula, north-western Madagascar (14°18.55'S, 47°54.92'E, 170 m above sea level)", coll. F. Andreone, J. E. Randrianirina & M. Vences, 18.02. 2000.
Remarks: Five paratypes in MRSN.

Engystoma ovale var. *puncticulatum* Steindachner, 1901

Anz. Akad. Wiss. Wien, 38: 194-196 [abstract], Denkschr. K. K. Akad. Wiss., Math.-Naturwiss. Cl., Wien (1902), 72: 110 [description]

Holotype: Not traced, "Bodega Central am Rio Magdalena", coll. Prinzessin Therese von Bayern, collection date unknown.
Remarks: In contrast to the other taxa collected by Therese von Bayern (e. g. *Urotheca coronata, Tropidurus theresiae*) and described by Steindachner (1901) no material of *Engystoma ovale* var. *punctilatum* could be traced in the ZSM. We found neither any catalogue entry for this taxon nor an uncataloged specimen in the collection. Probably the specimen got lost between the description and the registration of the Therese von Bayern collection in 1926 in the ZSM or is still present in the NMW collection although it is not mentioned in Häupl et al. (1994).
Present name: Unknown. This taxon is not listed by Cochran & Goin (1970) and Frost (2004).

Platypelis occultans Glaw & Vences, 1992

Fieldguide Amph. Rept. Madagascar: 274

Paratype: ZSM 554/1999 (originally ZFMK 53736), male, "Nosy Be", Madagascar, coll. F. Glaw & J. Müller, 22.01.1992.
Remarks: Holotype and one paratype in ZFMK.

Plethodontohyla coronata Vences & Glaw, 2003

Copeia 2003 (4): 789

Paratype: ZSM 694/2001, adult male, "Mandraka, Fivondronona of Manjakandriana, Faritany of Antananarivo, central eastern Madagascar (18°55'S / 47°56'E, 1220 m above sea level)", coll. M. Vences & D. R. Vieites, 16.02.2001.
Remarks: Holotype in ZFMK.

Plethodontohyla mihanika Vences, Raxworthy, Nussbaum & Glaw, 2003

J. Herpetol. 37 (4): 630

Paratypes: ZSM 1087/2001 (originally ZFMK 60008), adult male, "Andasibe" [Madagascar], coll. F. Glaw, 14.-18.01.1995; ZSM 5/2002, adult male, "Andasibe", coll. M. Vences, I. Somorjai & L. Raharivololoniaina, 12.2001.

Scaphiophryne boribory **Vences, Raxworthy, Nussbaum & Glaw, 2003**

Herpetol. J. 13: 75-77

Paratypes: ZSM 7-8/2000, 2 adults, ZSM 644-645/2000, 2 adults, "Fierenana region" [Madagascar], coll. local collectors, 2000; ZSM 153/2002, adult male, "Fierenana region" [Madagascar], coll. local collectors, 01.2002.
Remarks: Paratype ZSM 643/2000 has been exchanged (now ZFMK 76102).

Scaphiophryne gottlebei **Busse & Böhme, 1992**

Rev. fr. Aquariol. 19 (1/2): 60

Paratype: ZSM 555/1999 (originally ZFMK 53544), juvenile, "Montagne de l'Isalo: Vallée des Singes, W-Madagascar", coll. G. Gottlebe, 1991.
Remarks: Holotype and four paratypes in ZFMK.

Scaphiophryne menabensis **Glos, Glaw & Vences, 2005**

Copeia 2005 (2): 253

Holotype: ZSM 186/2003, adult male, "Kirindy Forest C.F.P.F. (forest pond CS5), district of Morondava, province of Toliara, western Madagascar (44°39'E, 20°03'S; 18-40 m above sea level)", coll. J. Glos, 05.02.2002.
Paratypes: ZSM 187-188/2003, ZSM 193/2003, three adult females, ZSM 189-190/2003, ZSM 192/2003, three adult males, "Kirindy Forest C.F.P.F. (forest pond CS5), district of Morondava, province of Toliara, western Madagascar", coll. J. Glos, 05.02.2002; ZSM 191/2003, adult male, "Kirindy Forest C.F.P.F. (forest pond CS7)", coll. J. Glos, 13.01.2001.

Stumpffia gimmeli **Glaw & Vences, 1992**

Fieldguide Amph. Rept. Madagascar: 273

Paratype: ZSM 556/1999 (originally ZFMK 52538), 1 specimen, "Ambanja" [Madagascar], coll. F. Glaw & M. Vences, 27.03.1991.
Remarks: Holotype and 13 paratypes in ZFMK.

Stumpffia pygmaea **Vences & Glaw, 1991**

Acta Biol. Benrodis 3 (2): 215

Paratype: ZSM 557/1999 (originally ZFMK 52543), male, "Nosy Be, Madagascar", coll. F. Glaw & M. Vences, 28.-29.03.1991.
Remarks: Holotype and two paratypes in ZFMK.

Stumpffia tetradactyla **Vences & Glaw, 1991**

Acta Biol. Benrodis 3 (2): 216

Paratype: ZSM 558/1999 (originally ZFMK 52546), male, "Foret d'Ambohidena, nahe dem Ort Ambohidena, an der Ostküste von Nosy Boraha" [Madagascar], coll. F. Glaw & M. Vences, 07.03.1991.
Remarks: Holotype and one paratype in ZFMK.

Xenobatrachus multisica **Blum & Menzies, 1989**

Alytes 7 ("1988"): 150

Paratypes: ZSM 105/1987/1-6 (cited as 105/87 in the original description), 6 specimens, "Munggona, Eipomek Valley of Irian Jaya, Jayawijaya Division, altitude 1800 m", coll. J. P. Blum, 04.-06.1976.

Xenobatrachus scheepstrai **Blum & Menzies, 1989**

Alytes 7 ("1988"): 151

Paratype: ZSM 103/1987 (cited as 103/87 in the original description), adult female, "Angguruk, Irian Jaya, Jayawijaya Division, altitude 1400 m", coll. G. Scheepstra, 06.1979.

Xenobatrachus schiefenhoeveli **Blum & Menzies, 1989**

Alytes 7 ("1988"): 143

Paratypes: ZSM 104/1987/1-3 (cited as ZSM 104/87a-c in the original description), 3 specimens, "Munggona in the Eipomek Valley of Irian Jaya, Jayawijaya Division, altitude 1800 m", coll. J. P. Blum, 04.-06.1976.

Xenorhina eiponis **Blum & Menzies, 1989**

Alytes 7 ("1988"): 154

Paratype: ZSM 106/1987/1-2 (cited as 106/87 in the original description), 2 specimens, "Munggona, Eipomek Valley, Irian Jaya, Jayawijaya Division, altitude 1800 m", coll. J. P. Blum, 04.-06.1976.

Pipidae Gray, 1825

Pipa aspera **Müller, 1924**

Zool. Anz. 58: 291

Holotype: ZSM 19/1923 (lost), adult male, "Albina (Unterlauf des Maroni), Surinam", collector and collection date unknown.
Remarks: AMNH 107864 was designated as neotype by Trueb & Cannatella (1986).

Pipa cururu **Spix, 1824**

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 53

Syntypes: uncatalogued (lost), 3 specimens, "Habitat in fundo aquarum lacustrium prope Bahiam et ad flumen Amazonum" [Brazil, near the city of Salvador (erroneous) and Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: In the original description (Spix 1824: pl. 22, fig. 1, 2) the species is figured under the name *Pipa Curucuru* (see also Hoogmoed & Gruber 1983: 377 for the various misspellings of this name).
Present name: *Pipa pipa* (Linnaeus, 1758) fide Hoogmoed & Gruber (1983).

Pipa snethlageae **Müller, 1914**

Ann. Mag. nat. Hist. 14: 102

Holotype: ZSM 1/1914 (lost), adult female, "Utinga near Pará (Belém), State of Pará, N. E. Brazil", coll. Dr. Emilia Snethlage, 13.02.1913.
Neotype: ZSM 54/1914/1 (former paratype), brooding female, same data as holotype, designated by Trueb & Cannatella (1986).
Paratype: ZSM 54/1914/2, male, same data as holotype.
Remarks: Trueb & Cannatella (1986: 449) mentioned the specimens MCZ 17734 and CAS-SU 16409 both from Utinga, near Belem as paratypes. This is obviously incorrect since Müller (1914) mentioned only three specimens in the original description ("I have before me one male and two females, the latter with empty egg-capsules on the back, consequently fully adult"). These three specimens are the lost holotype and the two original paratypes (ZSM 54/1914/1-2) one of them subsequently designated as neotype. According to Müller's (1924a) counts there were 39 "Waben" on the back of the holotype, and 25 on the female cotype. The specimen designated as neotype (ZSM 54/1914/1, figured in Trueb & Cannatella 1986) has 25 distinct (plus some indistinct) "Waben" and therefore obviously is the original female paratype.

The collection date of the types is not mentioned in the original description, but was given as 13.02. 1903 by Müller (1924a). This is obviously wrong since both the catalogue entry and jar labels mention 13.02.1913.

Fig. 19. *Pipa snethlágeae* Müller, 1914, neotype (ZSM 54/1914/1). In this species, the eggs develop in the female's back.

Ranidae Rafinesque, 1814

Batrachylodes elegans **Brown & Parker, 1970**

Breviora 346: 14

Paratypes: ZSM 1-5/1998, ZSM 8-27/1998, 25 adults (originally MCZ), "Bougainville Island, Solomon Islands [...] Mutahi, between 1800 and 3600 feet elevation", coll. F. Parker, 10.-20.05.1966.

Cornufer beauforti **van Kampen, 1913**

Bijdr. Dierk. 19: 91

Syntype: ZSM 268/1975 (originally ZMA), 1 adult, "Majalibit-Bucht, Waigeu" [Papua, Indonesia], coll. R. F. de Beaufort, 1910.
Present name: *Platymantis punctata* Peters & Doria, 1878 (fide Zweifel 1969: 12-16).

Phrynobatrachus phyllophilus **Rödel & Ernst, 2002**

J. Herpetol. 36 (4): 563

Paratype: ZSM 354/2001, male, "Thai National Park, Ivory Coast, SRET station, swampy area in primary

Fig. 20. *Rana japonica* var. *ornativentris* Werner, 1903, holotype (ZSM 962/0), now *Rana ornativentris.* This is a close relative of the European common frog *(Rana temporaria).*

rain forest, 5°50'N, 7°20'W", coll. Ernst & Rödel, 28. 09.1999.

Rana japonica var. *ornativentris* Werner, 1903

Abh. K. Bayer. Akad. Wiss. II. Kl. 22: 383

Holotype: ZSM 962/0, female, "bei Nikko auf Nippon" [Japan], coll. Haberer, no date.
Present name: *Rana ornativentris* Werner, 1903 (see Okada 1966: 81-90).

Rana palmipes Spix, 1824

Animal. Nova Spec. Nov. Test. Ran. Brasil.: 29

Syntypes: ZSM 963/0 (lost), 2 specimens, "Habitat [...] in aquis stagnantibus fluminis Amazonum" [Brazil, Rio Amazonas] (according to the original description and Vanzolini 1981), coll. Spix and Martius expedition to Brazil, 1817-1820.
Remarks: The original description was based on four specimens but only two specimens (ZSM 963/0) were catalogued.
Present name: *Rana palmipes* (Spix, 1824) fide Hoogmoed & Gruber (1983).

Tomopterna maskeyi Schleich & Anders, 1998

Veröff. Fuhlrott-Mus. 4: 63

Holotype: ZSM 106/1991/2 (cited as ZSM 106/91-2 in the original description), female, "Chitwan Jungle Lodge, Royal Chitwan National Park, Central Nepal, at an altitude of approx. 300 m", coll. H. Schleich, D. Fuchs & T. M. Maskey, 08.07.1989 (coll. H. Schleich & T. M. Maskey, 08.07.1991 according to the original description).
Paratypes: ZSM 106/1991/1, ZSM 106/1991/3, ZSM 106/1991/5-7, 4 females, 1 male, "S-Nepal, Chitwan-National-Park, Kasara", same collectors and collection date as holotype (given as ZSM 106/91-1, 3, 5-7, no locality data, coll. Schleich & Maskey, no collection date in the original description).
Present name: *Sphaerotheca maskeyi* (Schleich & Anders, 1999) fide Vences et al. (2000).

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References

Andersson, L. G. 1905. Batrachians from Cameroon collected by Dr. Y. Sjöstedt in the years 1890-1892. – Arkiv Zool. **2** (20):1-29

Andreone, F. 1996. Another new green treefrog, *Boophis anjanaharibeensis* n. sp. (Ranidae: Rhacophorinae), from northeastern Madagascar. – Aqua (J. Ichthyol. Aquat. Biol.) **2** (2): 25-32

-- & H. Randriamahazo 1997. Ecological and taxonomic observations on the amphibians and reptiles of the Andohahela low altitude rainforest, S. Madagascar. – Rev. fr. Aquariol. **24** (3-4): 95-127

-- M. Vences, F. M. Guarino, F. Glaw & J. E. Randrianirina 2002. Natural history and larval morphology of *Boophis occidentalis* (Anura: Mantellidae: Boophinae) provide new insights into the phylogeny and adaptive radiation of endemic Malagasy frogs. – J. Zool. **257**: 425-438

Angulo, A., R. B. Cocroft & S. Reichle 2003. Species identity in genus *Adenomera* (Anura: Leptodactylidae) in southeastern Peru. – Herpetologica **59** (4): 490-504

Anonymus 2002. Opinion 2013 (Case 3173) *Phrynidium crucigerum* Lichtenstein & Martens, 1856 (currently *Atelopus cruciger*; Amphibia, Anura): specific name conserved by the designation of a neotype. – Bull. Zool. Nomenclat. **59** (3): 226-227

Baldissera, Jr., F. A., U. Caramaschi & C. F. B. Haddad. 2004. Review of the *Bufo crucifer* species group, with descriptions of two new related species (Amphibia, Anura, Bufonidae). – Arq. Mus. Nac. Rio de Janeiro **62** (3): 255-282

Bauer, A. M., R. Günther & R. Klipfel 1995. The herpetological contributions of Wilhelm Peters (1815-1883). – SSAR, Ithaca, New York, 714 pp.

Baumann, F. 1912. Brasilianische Batrachier des Berner Naturhistorischen Museums nebst Untersuchungen über die geographische Verbreitung der Batrachier in Brasilien. – Zool. Jb. Abt. Syst. **33** (2): 87-172, fig. A, plts. 4-6

Blommers-Schlösser, R. M. A. 1979a. Biosystematics of the Malagasy frogs. I. Mantellinae (Ranidae). – Beaufortia **29** (352): 1-77

-- 1979b. Biosystematics of the Malagasy frogs. II. The genus *Boophis* (Rhacophoridae). – Bijdr. Dierk. **49** (2): 261-312

Blum, J. P. & J. I. Menzies "1988" 1989. Notes on *Xenobatrachus* and *Xenorhina* (Amphibia: Microhylidae) from New Guinea with description of nine new species. – Alytes **7** (4): 125-163

Böhme, W. & W. Bischoff 1984. Reptilien und Amphibien. In: Rheinwald, G. (ed.): Die Wirbeltiersammlungen des Museums Alexander Koenig. – Bonn. Zool. Monogr. **19**: 151-213

Boettger, O. 1895. Liste der Reptilien und Batrachier der Insel Halmaheira nach den Sammlungen Prof. Dr. W. Kükenthal's. – Zool. Anz. **18**: 129-138

Bokermann, W. C. A. 1966. Lista anotada das localidades tipo de anfíbios Brasileiros. – Serviçio de Documentação, Universidade Rural São Paulo, 183 pp.

Boulenger, G. A. 1896. Descriptions of new reptiles and batrachians from Colombia. – Ann. Mag. Nat. Hist. (6) **17**: 16-21

-- 1898. An account of the reptiles and batrachians collected by Mr. W. F. H. Rosenberg in western Ecuador. – Proc. Zool. Soc. London **1898**: 107-126 + plts 11-12

Brame, A. H. & D. B. Wake 1962. A new plethodontid salamander (genus *Bolitoglossa*) from Venezuela with redescription of the Ecuadorian *B. palmata* (Werner). – Copeia **1962**: 170-177

Brown, W. C. & F. Parker 1970. New frogs of the genus *Batrachylodes* (Ranidae) from the Solomon Islands. – Breviora **346**: 1-31

Busse, K. 1981. Revision der Farbmuster-Variabilität in der madagassischen Gattung *Mantella* (Salientia: Ranidae). – Amphibia-Reptilia **2**: 23-42

-- & W. Böhme 1992. Two remarkable frog discoveries of the genera *Mantella* (Ranidae: Mantellinae) and *Scaphiophryne* (Microhylidae: Scaphiophryninae) from the west coast of Madagascar. – Rev. fr. Aquariol. **19** (1/2): 57-64

Cei, J. M. 1980. Amphibians of Argentina. – Monit. Zool. Ital. (N.S.), Monogr. **2**, Firenze, 609 pp.

Clergue-Gazeau, M. 1999. *Euproctus asper* (Dugès, 1852) – Pyrenäen-Gebirgsmolch. – In: Thiesmeier, B. & K. Grossenbacher (eds.): Handbuch der Reptilien und Amphibiens Europas. Band 4/I, Schwanzlurche I: 251-269. – Aula-Verlag (Wiesbaden).

Cochran, D. 1955. Frogs of southeastern Brazil. – Smithsonian Inst. U. S. Nat. Mus. Bull. **206**, 423 pp.

-- 1961. Type specimens of reptiles and amphibians in the United States National Museum. – Smithsonian Inst. U. S. Nat. Mus. Bull. **220**: 1-290

-- & C. J. Goin 1970. Frogs of Colombia. – Smithon. Inst. Press, Washington, 655 pp.

Cocteau, T. 1835. Sur un genre peu connu et imparfaitement décrit de Batraciens anoures à carapace dorsale osseuse et sur une nouvelle espèce de ce genre. – Mag. Zool. Anat. **5**: 1-12, plts 7, 8

De la Riva, I., J. Köhler, S. Lötters & S. Reichle 2000. Ten years of research on Bolivian amphibians: updated checklist, distribution, taxonomic problems, literature and iconography. – Rev. Esp. Herp. **14**: 19-164

Duellman, W. E. 1971. The nomenclatural status of the names *Hyla boans* (Linnaeus) and *Hyla maxima* (Laurenti) (Anura: Hylidae). – Herpetologica **27**: 397-405

-- 1977. Liste der rezenten Amphibien und Reptilien. Hylidae, Centrolenidae, Pseudidae. – Das Tierreich **95**: I-XIX + 225 pp., Walter de Gruyter, Berlin, New York.

-- 1989. New species of hylid frogs from the Andes of Columbia and Venezuela. – Occ. Pap. Mus. Nat. Hist., Univ. Kansas, Lawrence **131**: 1-12

-- 1993. Amphibian species of the world: Additions and corrections. – Univ. Kansas, Mus. Nat. Hist., spec. publ. **21**: 372 pp.

-- , I. De la Riva & E. R. Wild 1997. Frogs of the *Hyla armata* and *Hyla pulchella* groups in the Andes of South America, with definitions and analyses of phylogenetic relationships of Andean groups of *Hyla*. – Scient. Pap. Nat. Hist. Mus. Univ. Kansas **3**: 1-41

-- & L. Trueb 1983. Frogs of the *Hyla columbiana* group: taxonomy and phylogenetic relationships. – In: Rhodin, A. G. J. & K. Miyata (eds.): Advances in herpetology and evolutionary biology: 33-51. – Harvard University (Cambridge)

-- & J. J. Wiens 1992. The status of the hylid frog genus *Ololygon* and the recognition of *Scinax* Wagler, 1830. – Occas. Pap. Mus. Nat. Hist. Univ. Kansas **151**: 1-23

-- & J. J. Wiens 1993. Hylid frogs of the genus *Scinax* Wagler, 1830, in Amazonian Ecuador and Peru. – Occas. Pap. Mus. Nat. Hist. Univ. Kansas **153**: 1-23

Dunn, E. R. 1942. The American caecilians. – Bull. Mus. Comp. Zool. **91**: 339-540

Eiselt, J. & J. F. Schmidtler 1971. Vorläufige Mitteilung über zwei neue Subspezies von Amphibia Salientia aus dem Iran. – Ann. Naturhist. Mus. Wien 75: 383-385

-- & -- 1973. Froschlurche aus dem Iran unter Berücksichtigung außeriranischer Populationsgruppen. – Ann. Naturhistor. Mus. Wien **77**: 181-243

Faivovich, J., C. A. G. da Cruz & O. L. Peixoto 2002. The identity of *Hyla ehrhardti* Müller, 1924 (Anura, Hylidae). – J. Herpetol. **36** (2): 325-327

-- , C. F. B. Haddad, P. C. A. Garcia, D. R. Frost, J. A. Campbell & W. C. Wheeler. 2005. Systematic review of the frog family Hylidae, with special reference to Hylinae: phylogenetic analysis and taxonomic revision. – Bull. Amer. Mus. Nat. Hist. **294**: 240 pp.

Fitzinger, L. J. 1826. Neue Classification der Reptilien nach ihren natürlichen Verwandtschaften. Nebst einer Verwandtschaftstafel und einem Verzeichnisse der Reptilien-Sammlung des K. K. Zoologischen Museums zu Wien. – Wien, 66 pp. + 1 pl.

Flores-Villela, O. 1993. Herpetofauna Mexicana. Lista anotada de las especies de anfibios y reptiles de México, cambios taxonómicos recientes, y nuevas especies. – Carnegie Mus. Nat. Hist., Special Publ. **17**, Pittsburgh, 73 pp.

Fouquette, M. J. Jr. & A. J. Delahoussaye 1977. Sperm morphology in the *Hyla rubra* group (Amphibia, Anura, Hylidae), and its bearing on generic status. – J. Herpetol. **11** (4): 387-396

Frost, D. R., ed. 1985. Amphibian species of the world. A taxonomic and geographical reference. – Lawrence (Allen Press) Assoc. Syst. Coll., 732 pp.

-- 2004. Amphibian Species of the World: an Online Reference. Version 3.0 (22 August, 2004). Electronic Database accessible at http://research.amnh.org/herpetology/amphibia/index.html. – American Museum of Natural History, New York, USA.

Gavetti, E. & F. Andreone 1993. Revised catalogue of the herpetological collection in Turin University. I. Amphibia. – Mus. reg. Sci. nat. Torino. Cataloghi **X**: 1-185

Glaw, F. & M. Franzen 2003. A database of type specimens of amphibians and reptiles in German research collections. – Symposium-Report "Sustainable use and conservation of biological diversity – A challenge for society". Part A: 325-326 (Berlin, Dez. 2003)

-- & -- 2004. A digital type catalogue of amphibians and reptiles in German research collections: progress and perspectives. – In: Berendsohn, W. G. & S. Oehlschlaeger (eds.): Projects in the German National Programme for the Global Biodiversity Information Facility 2003-2006, Status Report 2004: 136-137

-- & D. Fuchs 2001. Die Herpetologie in der Zoologischen Staatssammlung München. – In: W. Rieck, G. Hallmann & W. Bischoff (eds.): Die Geschichte der Herpetologie und Terrarienkunde im deutschsprachigen Raum. – Mertensiella **12**: 374-377

-- & B. Thiesmeier 1993. Bioakustische Differenzierung in der *Boophis luteus*-Gruppe (Anura: Rhacophoridae), mit Beschreibung einer neuen Art und einer neuen Unterart. – Salamandra **28** (3/4): 258-269

-- & M. Vences 1991. Ein neuer *Heterixalus* aus Madagaskar (Amphibia, Anura, Hyperoliidae). – Acta Biol. Benrodis **3** (2): 197-201

-- & -- 1992. A fieldguide to the amphibians and reptiles of Madagascar. – Vences & Glaw Verlag, Köln, 331 pp. + 16 colour pages

-- & -- 1994. A fieldguide to the amphibians and reptiles of Madagascar, 2nd edition. – Vences & Glaw Verlag, Köln, 480 pp.+ 48 colour pages

-- & -- 1997a. Neue Ergebnisse zur *Boophis goudoti*-Gruppe aus Madagaskar: Bioakustik, Fortpflanzungsstrategien und Beschreibung von *Boophis rufioculis* sp. nov. – Salamandra **32** (4): 225-242

-- & -- 1997b. Neue Daten über die *Mantidactylus*-Untergattung *Spinomantis* (Anura: Ranidae: Mantellinae) aus Madagaskar, mit Beschreibung einer neuen Art. – Salamandra **32** (4): 243-258

-- & -- 1997c. New species of the *Boophis tephraeomystax* group (Anura: Ranidae: Rhacophorinae) from arid western Madagascar. – Copeia **1997** (3): 572-578

-- & -- 2000. A new species of *Mantidactylus* from northeastern Madagascar with resurrection of *Mantidactylus blanci* (Guibé, 1974) (Amphibia, Anura, Ranidae). – Spixiana **23** (1): 71-83

-- & -- 2001. Two new sibling species of *Mantidactylus cornutus* from Madagascar (Amphibia, Anura, Ranidae). – Spixiana **24** (2): 177-190

-- & -- 2002a. A new sibling species of the anuran subgenus *Blommersia* from Madagascar (Amphibia: Mantellidae: *Mantidactylus*) and its molecular phylogenetic relationships. – Herpetol. J. **12**: 11-20

-- & -- 2002b. A new cryptic treefrog species of the *Boophis luteus* group from Madagascar: bioacoustic and genetic evidence. – Spixiana **25** (2): 173-181

-- & -- 2002c. A new species of *Mantidactylus* (Anura: Mantellidae) from Andasibe in eastern Madagascar. – J. Herpetol. **36** (3): 372-378

-- & -- 2002d. A new cryptic species of the *Mantidactylus boulengeri* group with a divergent vocal sac structure. – Amphibia-Reptilia **23** (3): 293-304

-- & -- Vences 2004. A preliminary review of cryptic diversity in the subgenus *Ochthomantis* based on mtDNA sequence data and morphology (Anura, Mantellidae, *Mantidactylus*). – Spixiana **27** (1): 83-91

-- & -- 2005. A new arboreal microhylid frog of the genus *Anodonthyla* from south-eastern Madagascar (Amphibia, Microhylidae). – Spixiana **28** (2): 181-189

-- , -- , F. Andreone & D. Vallan 2001. Revision of the *Boophis majori* group (Amphibia: Mantellidae) from Madagascar, with descriptions of five new species. – Zool. J. Linn. Soc. **133** (4): 495-529

-- , -- , & W. Böhme 1998. Systematic revision of the genus *Aglyptodactylus* Boulenger, 1919 (Anura: Ranidae) and analysis of its phylogenetic relationships with other ranid genera from Madagascar (*Tomopterna, Boophis, Mantidactylus* and *Mantella*). – J. Zool. Syst. Evol. Res. **36**: 17-37

-- , -- , & V. Gossmann 2000. A new species of *Mantidactylus* (subgenus *Guibemantis*) from Madagascar, with a comparative survey of internal femoral gland structure in the genus (Amphibia: Ranidae: Mantellinae). – J. Nat. Hist. **34**: 1135-1154

Glos, J., F. Glaw & M. Vences 2005. A new species of *Scaphiophryne* from western Madagascar. – Copeia **2005** (2): 252-261

Gruber, U. 1992. Die Sektion Herpetologie (Lurche und Kriechtiere) der Zoologischen Staatssammlung München. – Spixiana Suppl. **17**: 126-132

Güntert, M., K. Grossenbacher, C. Huber, A. Aerni & H. U. Morgenthaler 1993. The E. A. Goeldi zoological collection in the Natural History Museum Bern: Comments on an inventory. – Jb. Naturhist. Mus. Bern **11**: 147-161

Häupl, M., F. Tiedemann & H. Grillitsch 1994. Katalog der Typen der Herpetologischen Sammlung nach dem Stand vom 1. Jänner 1994. Teil I: Amphibia. – Kataloge der wissenschaftlichen Sammlungen des Naturhistorischen Museums in Wien, Vertebrata. – Selbstverlag Naturhist. Mus. Wien **9** (3): 1-102

Hellmich, W. 1940a. Beitrag zur Kenntnis der individuellen und geographischen Variabilität von *Hyla vilsoniana* Cope. (Ergebnisse einer Forschungsreise in Kolumbien I.). – Zool. Anz. **129** (1/2): 1-12

-- 1940b. Beiträge zur Kenntnis der Gattung *Hyloxalus* (Brachycephalidae, Amph.). (Ergebnisse einer Forschungsreise in Kolumbien III.). – Zool. Anz. **131** (5/6): 113-128

Hemmer, H., J. F. Schmidtler & W. Böhme 1978. Zur Systematik zentralasiatischer Grünkröten (*Bufo viridis*-Komplex) (Amphibia, Salientia, Bufonidae). – Zool. Abh. Staatl. Mus. Tierk. Dresden **34**: 349-384

Heyer, W. R. 1970. Studies on the frogs of the genus *Leptodactylus* (Amphibia: Leptodactylidae). 6. Biosystematics of the *melanonotus* group. – Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. **191**: 1-48

-- 1973. Systematics of the *marmoratus* group of the frog genus *Leptodactylus* (Amphibia, Leptodactylidae). – Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. **251**: 1-50

-- 1974. Relationships of the *marmoratus* species group (Amphibia, Leptodactylidae) within the subfamily Leptodactylinae. – Contrib. Sci. Nat. Hist. Mus. Los Angeles Co. **253**: 1-46

-- 1983. Variation and systematics of frogs of the genus *Cycloramphus* (Amphibia, Leptodactylidae). – Arq. Zool., Sao Paulo **30**: 235-339

-- 1994. Variation within the *Leptodactylus podicipinus-wagneri* complex of frogs (Amphibia: Leptodactylidae). – Smithson. Contrib. Zool. **546**: 1-124

Hoogmoed, M. S. 1986. Additional remarks on Spix types in the Rijksmuseum van natuurlijke Historie, Leiden. – Zool. Mededel. **60**: 299-300

-- 1990. Biosystematics of South American Bufonidae with special reference to the *Bufo typhonius* group. – In: Peters, G. & R. Hutterer (eds.): Vertebrates in the Tropics: 113-123. – Museum Alexander Koenig (Bonn)

-- & U. Gruber 1983. Spix and Wagler type specimens of reptiles and amphibians in the Natural History Musea in Munich (Germany) and Leiden (The Netherlands). – Spixiana, Suppl. **9**: 319-415

Köhler, J. & W. Böhme 1996. Anuran amphibians from the region of Pre-Cambrian rock outcrops (inselbergs) in northeastern Bolivia, with a note on the gender of *Scinax* Wagler, 1830 (Hylidae). – Rev. fr. Aquariol. **23** (3-4): 133-140

-- & S. Lötters 2001. Description of a small tree frog, genus *Hyla* (Anura: Hylidae), from humid Andean slopes of Bolivia. – Salamandra **37** (3): 175-184

Lahanas, P. N. & J. M. Savage 1992. A new species of caecilian from the Península de Osa of Costa Rica. – Copeia **1992** (3): 703-708

Lescure, J. 1979. Étude taxinomique et éco-éthologique d'un amphibien des petites Antilles: *Leptodactylus fallax* Müller, 1926 (Leptodactylidae). – Bull. Mus. natn. Hist. nat. Paris, 4e sér, **1**, section A (3): 757-774

Lichtenstein, H. & E. Martens 1856. Nomenclator Reptilium et Amphibiorum Musei Zoologici Berolinensis. Namensverzeichniss der in der zoologischen Sammlung der Königlichen Universität zu Berlin aufgestellten Arten von Reptilien und Amphibien nach ihren Ordnungen, Familien und Gattungen. – Berlin, iv + 48 pp.

Lötters, S., P. Debold, K. Henle, F. Glaw & M. Kneller 1997. Ein neuer Pfeilgiftfrosch aus der *Epipedobates pictus*-Gruppe vom Osthang der Cordillera Azul in Perú. – Herpetofauna **19** (110): 25-34

-- J. Köhler 2000. A new toad of the *Bufo typhonius* complex from humid montane forests of Bolivia (Amphibia, Anura, Bufonidae). – Spixiana **23** (3): 293-303

-- & E. La Marca 2001. Case 3173. *Phrynidium crucigerum* Lichtenstein & Martens, 1856 (currently *Atelopus cruciger*; Amphibia, Anura): proposed conservation of the specific name by the designation of a neotype. – Bull. Zool. Nomenclat. **58** (2): 119-121

– – , E. La Marca & M. Vences 2004. Redescription of two toad species of the genus *Atelopus* from coastal Venezuela. – Copeia **2004** (2): 222-234

Lynch, J. D. 1970. Systematic status of the American leptodactylid frog genera *Engystomops*, *Eupemphix*, and *Physalaemus*. – Copeia **1970** (3): 488-496

– – & W. E. Duellman 1997. Frogs of the genus *Eleutherodactylus* (Leptodactylidae) in western Ecuador: systematics, ecology, and biogeography. – Univ. Kansas Nat. Hist. Mus., Special Publ. **23**, 236 pp.

McCranie, J. R., D. B. Wake & L. D. Wilson 1996. The taxonomic status of *Bolitoglossa schmidti*, with comments on the biology of the Mesoamerican salamander *Bolitoglossa dofleini* (Caudata: Plethodontidae). – Caribb. J. Science **32** (4): 395-398

Mertens, R. 1967. Die herpetologische Sektion des Naturmuseums und Forschungsinstitutes Senckenberg in Frankfurt a. M. nebst einem Verzeichnis ihrer Typen. – Senckenb. Biol. **48** (Sonderheft A): 1-106

– – & H. Wermuth 1960. Die Amphibien und Reptilien Europas (Dritte Liste, nach dem Stand vom 1. Januar 1960). – Waldemar Kramer, Frankfurt/M., 264 pp.

Michels, J. P. & A. M. Bauer (2004): Some corrections to the scientific names of amphibians and reptiles. – Bonn. zool. Beitr. **52** (1/2): 83-94

Müller, L. 1914. On a new species of the genus *Pipa* from northern Brazil. – Ann. Mag. nat. Hist. **14** (8): 102

– – 1922. Über eine Sammlung Froschlurche von Sta. Catharina, nebst Beschreibung zweier neuer Arten. – Bl. f. Aquar.-Terrar.-kde. **33**: 167-171

– – 1923a. Ueber neue oder seltene mittel- und südamerikanische Amphibien und Reptilien. – Mitt. Zool. Mus. Berlin **11**: 77-93

– – 1923b. Neue oder seltene Reptilien und Batrachier der Zoologischen Sammlung des bayr. Staates. – Zool. Anz. **57** (1/2): 38-42

– – 1923c. Neue oder seltene Reptilien und Batrachier der Zoologischen Sammlung des bayr. Staates. – Zool. Anz. **57** (3/4): 49-61

– – 1923d. Neue oder seltene Reptilien und Batrachier der Zoologischen Sammlung des bayrischen Staates. – Zool. Anz. **57** (7/8): 145-156

– – 1924a. Neue oder seltene Reptilien und Batrachier der Zoologischen Sammlung des bayerischen Staates. – Zool. Anz. **58**: 291-297

– – 1924b. Neue Laubfrösche aus dem Staate Santa Catharina, S. O. Brasilien. – Zool. Anz. **59**: 233-238

– – 1924c. Neue Batrachier aus Ost-Brasilien. – Senckenbergiana **6**(5/6): 169-177

– – 1926. Neue Reptilien und Batrachier der Zoologischen Sammlung des bayrischen Staates. – Zool. Anz. **65**: 193-200

– – 1927. Amphibien und Reptilien der Ausbeute Prof. Bresslau's in Brasilien 1913-14. – Abh. Senckenb. Naturf. Ges. **40** (3): 259-304

– – 1934. Über eine neue Rasse von *Atelopus cruciger* (Licht u. Marts.) von Venezuela. – Zool. Anz. **108** (7/8): 145-155

– – 1938. Batrachologische Mitteilungen. – Zool. Anz. **121** (9/10): 284-288

– – & W. Hellmich 1935. Mitteilungen über die Herpetofauna der Iberischen Halbinsel. I. Über *Salamandra salamandra almanzoris* n. ssp. und *Bufo bufo gredosicola* n. ssp., zwei neue Amphibienrassen aus der Sierra de Gredos. – Zool. Anz. **112** (3/4): 49-57

– – & – – 1936. Wissenschaftliche Ergebnisse der deutschen Gran Chaco-expedition. Amphibien und Reptilien. I. Teil: Amphibia, Chelonia, Loricata. Strecker und Schröder, Stuttgart, 120 pp.

Naumann, C. & R. van den Elzen 2004. GBIF-D Vertebrata: An electronic catalogue of primary types of vertebrates in German research collections. – In: Berendsohn, W. G. & S. Oehlschlaeger (eds.): Projects in the German National Programme for the Global Biodiversity Information Facility 2003-2006, Status Report 2004: 132-133

Okada, Y. 1966. Fauna Japonica. Anura (Amphibia). – Biogeogr. Soc. Japan, Tokyo, 234 pp. + plates

Parker, H. W. 1936. The amphibians of Mamfe Division, Cameroons. I. Zoogeography and systematics. – Proc. Zool. Soc. London 1936: 135-163

Peracca, M. G. 1898. Descrizione di una nuova specie di tritone italiano, *Molge italica* n. sp. – Boll. Mus. Zool. Anat. comp. Univ. Torino **13** (317): 1-6

Peters, W. 1854. Diagnosen neuer Batrachier, welche zusammen mit der früher (24. Juli und 17. August) gegebenen Übersicht der Schlangen und Eidechsen mitgetheilt werden. – Ber. Bekanntmach. geeignet. Verhandl. Königl.-Preuss. Akad. Wiss. Berlin **1854** (November): 614-628

– – 1862a. Über die Batrachier-Gattung *Hemiphractus*. – Monatsber. Königl. Akad. Wiss. Berlin **1862** (Februar): 144-152

– – 1862b. Eine neue Gattung von Laubfröschen, *Plectromantis*, aus Ecuador. – Monatsber. Königl. Akad. Wiss. Berlin **1862** (April): 232-233

– – 1872. Über die von Spix in Brasilien gesammelten Batrachier des Königlichen Naturalienkabinetts zu München. – Monatsber. Königl. Akad. Wiss. Berlin **1872** (März): 196-227

– – 1873. Über eine neue Schildkrötenart, *Cinosternon Effeldtii* und einige andere neue oder weniger bekannte Amphibien. – Monatsber Königl. Akad. Wiss. Berlin **1873** (Oktober): 603-618

Pintak, T. & W. Böhme 1990. *Mantella crocea* sp. n. (Anura: Ranidae: Mantellinae) aus dem mittleren Ost-Madagaskar. – Salamandra **26** (1): 58-62

Rivero, J. A. 1961. Salientia of Venezuela. – Bull. Mus. Comp. Zool. **126**: 1-207

Roček, Z., P. Joly & K. Grossenbacher 2003. *Triturus alpestris* (Laurenti, 1768) – Bergmolch. – In: Grossenbacher, K. & B. Thiesmeier (eds.): Handbuch der Reptilien und Amphibien Europas. Band 4/IIA. Schwanzlurche (Urodela) IIA: 607-656. – Aula-Verlag (Wiesbaden).

Rödel, M.-O. & R. Ernst 2002. A new *Phrynobatrachus* from the upper Guinean rain forest, west Africa, including a description of a new reproducive mode for the genus. – J. Herpetol. **36** (4): 561-571

– – , T. U. Grafe, V. H. W. Rudolf & R. Ernst 2002. A review of west African spotted *Kassina*, including a description of *Kassina schioetzi* sp. nov. (Amphibia: Anura: Hyperoliidae). – Copeia **2002** (3): 800-814

– – , J. Kosuch, M. Veith & R. Ernst 2003. First record of the genus *Acanthixalus* Laurent, 1944 from the upper Guinean rain forest, West Africa, with description of a new species. – J. Herpetol. **37** (1): 43-52

Ruiz-Carranza, P. M. & J. D. Lynch 1991. Ranas Centrolenidae de Colombia 1. Propuesta de una nueva clasificación genérica. – Loziana (Acta Zool. Columb.) **57**: 1-30

Savage, J. M. 1972. The systematic status of *Bufo simus* O. Schmidt with description of a new toad from western Panama. – J. Herpetol. **6** (1): 25-33

Schleich, H. H. & C. C. Anders 1998. *Tomopterna maskeyi* spec. nov. from Nepal (Amphibia, Anura). – Veröff. Fuhlrott-Mus. **4**: 57-72

Schlüpmann, M. & J. J. van Gelder 2004. *Triturus helveticus* (Razoumowsky, 1789) – Fadenmolch. – In: Thiesmeier, B. & K. Grossenbacher (eds.): Handbuch der Reptilien und Amphibiens Europas. Band 5/IIB, Schwanzlurche IIB: 759-846. – Aula-Verlag (Wiesbaden)

Schmidt, O. 1857. Diagnosen neuer Frösche des zoologischen Cabinets zu Krakau. – Sitzungsber. – Akad. Wiss. Wien, math. naturwiss. Kl., **24** (1): 10-15

– – 1858. Beschreibung der im K. K. Museum zu Krakau befindlichen, von J. v. Warszewics in New-Granada und Bolivia gesammelten ungeschwänzten Batrachier. – Denkschr. math.-naturwiss. Classe kaiserl. Akad. Wiss. Wien **14**: 237-258

Schmidtler, J. F. 1969. Herpetologische Beobachtungen in den Iberischen Randgebirgen, mit Beschreibung einer neuen Unterart von *Triturus helveticus* (Salamandridae, Amphibia). – Abh. Ber. Naturkd. Vorgesch. Magdeburg **11** (5): 219-231

Schmidtler, J. J. & J. F. Schmidtler 1969. Über *Bufo surdus*; mit einem Schlüssel und Anmerkungen zu den übrigen Kröten Irans und West-Pakistans. – Salamandra **5**: 113-123

Silverstone, P. A. 1976. A revision of the poison-arrow frogs of the genus *Phyllobates* Bibron in Saga (Family Dendrobatidae). – Nat. Hist. Mus. Los Angeles Co., Science Bull. **27**, 53 pp.

Solano, H. 1969. Beiträge zur Kenntnis der Amphibienfauna Venezuelas (Sammlung Pater Cornelius Vogl). – Veröff. Zool. Staatssamml. München **13**: 1-26

Sparreboom, M. **2003.** *Triturus italicus* (Peracca, 1898) – Italienischer Wassermolch. – In: Grossenbacher, K. & B. Thiesmeier (eds.): Handbuch der Reptilien und Amphibien Europas. Band 4/IIA. Schwanzlurche (Urodela) IIA: 707-725. – Aula-Verlag (Wiesbaden).

Spix, J. B., de 1824. Animalia nova sive species novae Testudinarum Ranarum, quas in itinere per Brasiliam annis MDCCCXVII-MDCCCXX jussu et auspiciis Maximiliani Josephi I. Bavariae regis. – Monachii, 4 pp. 1-53, pls. 1-17+1-22.

Steindachner, F. 1901. Herpetologische und ichthyologische Ergebnisse einer Reise nach Südamerika. – Anz. K. K. Akad. Wiss., Math.-Naturwiss. Cl., Wien 38. 194-196

– – 1902. Herpetologische und ichthyologische Ergebnisse einer Reise nach Südamerika. – Denkschr. K. K. Akad. Wiss., Math.-Naturwiss. Cl., Wien **72**: 89-148, Tafeln 1-5.

Stöck, M. 1997. Untersuchungen zur Morphologie und Morphometrie di- und tetraploider Grünkröten (*Bufo viridis*-Komplex) in Mittelasien (Amphibia: Anura: Bufonidae). – Zool. Abh. Staatl. Mus. Tierkunde Dresden **49** (12): 193-222

– – , R. Günther & W. Böhme 2001. Progress towards a taxonomic revision of the Asian *Bufo viridis* group: Current status of nominal taxa and unresolved problems (Amphibia: Anura: Bufonidae). – Zool. Abh. Staatl. Mus. Tierkunde Dresden **51** (18): 253-319

– – , M. Schmid, C. Steinlein & W.-R Grosse 1999. Mosaicism in somatic triploid specimens of the *Bufo viridis* complex in the Karakorum with examination of calls, morphology and taxonomic conclusions. – Ital. J. Zool. **66**: 215-232

Taylor, E. H. 1936. Notes on the herpetological fauna of the Mexican state of Sinaloa. – Univ. Kansas Science Bull., Lawrence **24** (20): 505-537

– – 1968. The caecilians of the world. – University of Kansas Press (Lawrence), 848 pp.

Thiesmeier, B. & K. Grossenbacher 2004. *Salamandra salamandra* (Linnaeus, 1758) – Feuersalamander. – In Grossenbacher, K. & B. Thiesmeier (eds.): Schwanzlurche (Urodela) IIB. Handbuch der Reptilien und Amphibien Europas. 4/IIB: 1059-1132. – Aula-Verlag (Wiesbaden)

Trueb, L. 1974. Systematic relationships of Neotropical horned frogs, genus *Hemiphractus* (Anura, Hylidae). – Occ. Pap. Mus. Nat. Hist., Univ. Kansas, Lawrence **29**: 1-60

– – & D. C. Cannatella 1986. Systematics, morphology, and phylogeny of the genus *Pipa* (Anura: Pipidae). – Herpetologica **42** (4): 412-449

Vallan, D., M. Vences & F. Glaw 2003. Two new species of the *Boophis mandraka* complex (Anura, Mantellidae) from the Andasibe region in eastern Madagascar. – Amphibia-Reptilia **24**: 305-319

Van Kampen, P. N. 1913. Amphibien von Waigeu und den Molukken. – Bijdr. Dierk. **19**: 89-92

Vanzolini, P. E. 1981. The scientific and political contexts of the Bavarian expedition to Brazil, pp. 9-29 in: Spix, J. B. v. & J. G. Wagler: Herpetology of Brazil. – SSAR Facsimile reprints in Herpetology

Vences, M., F. Andreone & F. Glaw 2005. A new microhylid frog of the genus *Cophyla* from a transitional forest in northwestern Madagascar. – African Zool. **40** (1): 143-149

– – , – – , – – & F. Mattioli 2002. New dwarf species of *Mantidactylus* from northwestern Madagascar (Anura: Mantellidae). – Copeia **2002** (4): 1057-1062

– – , – – , – – & J. E. Randrianirina 2003. Molecular and bioacoustic divergence in *Mantidactylus granulatus* and *M. zavona* sp. n. (Anura: Mantellidae): bearings for the biogeography of northern Madagascar. – African Zool. **38** (1): 67-78

Vences, M., F. Andreone & D. R. Vieites (2005): New treefrog of the genus *Boophis* Tschudi 1838 from the northwestern rainforests of Madagascar. – Tropical Zoology **18**: 237-249

– – & F. Glaw 1991. Revision der Gattung *Stumpffia* Boettger 1881 aus Madagaskar mit Beschreibung von zwei neuen Arten (Amphibia, Anura, Microhylidae). – Acta Biol. Benrodis **3** (2): 203-219

– – & – – 2001. Systematic review and molecular phylogenetic relationships of the direct developing Malagasy anurans of the *Mantidactylus asper* group (Amphibia: Mantellidae). – Alytes **19** (2-4): 107-139

– – & – – 2002. Two new treefrogs of the *Boophis rappiodes* group from eastern Madagascar (Amphibia: Mantellidae). – Trop. Zool. **15** (1): 141-163

– – & – – 2003. New microhylid frog *(Plethodontohyla)* with a supraocular crest from Madagascar. – Copeia **2003** (4): 789-793

– – & – – 2004. Revision of the subgenus *Chonomantis* (Anura: Ranidae: *Mantidactylus*) from Madagascar, with description of two new species. – J. Nat. Hist. **38** (1): 77-118

– – & – – 2005a. A new species of *Mantidactylus* from the east coast of Madagascar and its molecular phylogenetic relationships within the subgenus *Guibemantis*. – Herpetol. J. **15**: 37-44

– – & - - 2005b. A new cryptic frog of the genus *Boophis* from the north-western rainforests of Madagascar. – African J. Herpetol. **54** (1): 77-84

– – , – – & F. Andreone 1997. Two new frogs of the genus *Mantidactylus* from Madagascar, with notes on *Mantidactylus klemmeri* (Guibé, 1974) and *Mantidactylus webbi* (Grandison, 1953) (Amphibia, Ranidae, Mantellinae). – Alytes **14** (4): 130-146

– – , – – , – – , R. Jesu & G. Schimmenti 2002. Systematic revision of the enigmatic Malagasy broad-headed frogs (*Laurentomantis* Dubois, 1980) and their phylogenetic position within the endemic mantellid radiation of Madagascar. – Contrib. Zool. **70** (4): 191-212

– – , – – , J. Kosuch, I. Das & M. Veith 2000. Polyphyly of *Tomopterna* (Amphibia: Ranidae) based on sequences of the mitochondrial 16S and 12 rRNA genes, and ecological biogeography of Malagasy relict amphibian groups. – In: Lourenço, W. R. & S. M. Goodman (eds.): Diversité et Endémisme à Madagascar: 229-242. – Mém. Soc. Biogéogr. Paris

– – , – –, R. Jesu & G. Schimmenti 2000. A new species of *Heterixalus* (Amphibia: Hyperoliidae) from western Madagascar. – African Zool. **35** (2): 269-276

– – , C. J. Raxworthy, R. A. Nussbaum & F. Glaw 2003a. A revision of the *Scaphiophryne marmorata* complex of marbled toads from Madagascar, including the description of a new species. – Herpetol. J. **13**: 69-79

– – , – – , R. A. Nussbaum & F. Glaw 2003b. A new microhylid frog *(Plethodontohyla)* from Madagascar, with semiarboreal habits and possible parental care. – J. Herpetol. **37** (4): 629-636

Wagler, J. 1824. Serpentum Brasiliensium species nova ou histoire naturelle des espèce nouvelle des serpens recueillies et observées pendant le voyage dans l'interieur du Brésil dans le années 1817, 1818, 1819, 1820 exécuté par ordre de Sa Majesté le Roi de Bavière, publiée par Jean Spix. – Monachii, I-VIII, 1-75, 26 pls.

– – 1830. Natürliches System der Amphibien, mit vorangehender Classification der Säugethiere und Vögel. – München, Stuttgart, Tübingen (Cotta'sche Buchhandlung), 354 pp.

Wake, M. H. 1984. A new species of *Caecilia* (Amphibia: Gymnophiona) from Bolivia. – Amphibia-Reptilia **5** (3-4): 215-220

Werner, F. 1897a. Ueber einige neue oder seltene Reptilien und Frösche der zoologischen Sammlung des Staates in München. – Sitzungsber. mathemat.-physik. Classe d. k. bayer. Akad. d. Wiss. **27** (2): 203-220

– – 1897b. Über einige noch unbeschriebene Reptilien und Batrachier. – Zool. Anz. **20**: 261-267

– – 1902. Eine neue Varietät des Alpenmolches aus Bosnien: *Molge alpestris* var. *Reiseri*. – Verh. Zool.-Bot. Ges. Wien **52**: 7-9

– – 1903. Ueber Reptilien und Batrachier aus Guatemala und China in der zoologischen Staats-Sammlung in München nebst einem Anhang über seltene Formen aus anderen Gegenden. – Abh. K. Bayer. Akad. Wiss. II. Kl. 22: 343-384

Wilkinson, M. 1991. Adult tooth crown morphology in the Typhlonectidae (Amphibia: Gymnophiona). A reinterpretation of variation and its significance. – Z. Zool. Syst. Evolut.-forsch. **29**: 304-311

Wolterstorff, W. 1925. Über mehrere Lokalformen des Pyrenäenmolchs, *Euproctus asper* Dugés. – Abh. Ber. Mus. Nat. Heimatk. Magdeburg **4** (1): 61-76

Zweifel, R. G. 1958. Results of the Archbold expeditions. No. 78. Frogs of the Papuan hylid genus *Nyctimystes*. – Amer. Mus. Novit., New York **1896**, 51 pp.

– – 1969. Frogs of the genus *Platymantis* (Ranidae) in New Guinea, with the description of a new species. – Amer. Mus. Novit. **2374**: 1-19

– – 2000. Partition of the Australopapuan microhylid frog genus *Sphenophryne* with description of new species. – Bull. Amer. Mus. Nat. Hist. **253**: 1-130

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Zum 225. Geburtstag des Begründers der ZSM: Spix und der Aufbruch der Zoologie in die Moderne

Thomas Heinzeller

Heinzeller, T. (2006): To celebrate the 225th birthday of J. B. Ritter von Spix, founder of the ZSM: his role in the scientific controversies of his time. – Spixiana **29/3:** 193-197

225 years ago, Johann Baptist Spix was born in Höchstadt/Aisch. He made rapid advances in zoology, and when he died in Munich, after a life span of only 45 years, he had become no less than one of Europe's leading zoologists. Initially he was deeply influenced by F. W. Schelling's natural philosophy. Some years later french empiricists like G. Cuvier brought him back down to earth. In a very short period he compiled several important comprehensive studies, e.g. on the microarchitecture of seastars, sponges, leeches or on the formation of the cranium, he established the Munich Zoological Collections as a modern scientific institution and, last but not least, he organized an extremely fruitful 3-year expedition to Brazil. During this voyage he contracted a chronic tropical disease which permitted him only a few years to elaborate the scientific output of this travel. The fundamental questions of his age – chronologically Spix worked in the period after C. v. Linné and before Ch. Darwin – were those of a natural system and of species' descent. Obviously these were also Spix' themes and it's safe to say that he would have given meaningful answers to them if he had been allowed to work for a few more years than were begrudged to him.

Prof. Dr. T. Heinzeller, Anatomische Anstalt, Ludwig-Maximilians-Universität; e-mail: Thomas.Heinzeller@med.uni-muenchen.de

Die Vita von Johann Baptist Ritter von Spix (Abb. 1) wurde mehrfach dargestellt und gewürdigt (v.a. Fittkau, u.a. 1981, 1995). In der allgemeinen Wahrnehmung steht dabei die Expedition nach Brasilien 1817-1820 im Vordergrund (Tiefenbacher 1983). Deren reiche Ausbeute gab den Ausschlag dafür, daß aus der naturkundlichen Sammlung der Akademie der Wissenschaften ein weltweit konkurrenzfähiges Forschungsmuseum wurde. Und so trägt das Periodikum der heutigen Zoologischen Staatssammlung München zu Recht Spix' Namen. Im Jahre 2006 gedenken wir seines 225. Geburtstages und 180. Todestages.

Als Spix nach Brasilien aufbrach, war er 36 Jahre alt und nach einer steilen Karriere bereits in Amt und Würden: er war Dr. phil. und Dr. med., ordentliches Mitglied der Königlichen Akademie der Wissenschaften und Konservator der zoologisch-zootomischen Sammlung. Warum nimmt er die voraussehbaren Strapazen auf sich, ja stürzt sich begeistert in diese Unternehmung? Bei allem von Zeitgenossen gelegentlich gerüffeltem Temperament – eines war er sicher nicht, ein Abenteurer. Nein, seine Begeisterung bezog sich auf das Fach, es war Erkenntnishunger, denn aus der erwarteten Materialfülle erhoffte sich Spix Aufschluß über zentrale Fragen der Zoologie. Spix war in Jahre gewaltiger Umbrüche hinein geboren worden, für die Biologie bedeuteten sie einen Aufbruch in die Moderne, um die Richtung dieses Aufbruchs wurde heftig gestritten.

Damit Spix nicht "nur" als Forschungsreisender gesehen wird (die ungeheure Leistung dieser Expedition, die er letztlich mit dem Leben bezahlte, bleibt selbstverständlich sein herausragender Beitrag zur Zoologie), soll er hier auch einmal als aktiver Teilnehmer an der zoologischen, philosophischen und gesellschaftlichen Debatte seiner Zeit, speziell der ersten beiden Jahrzehnte des 19. Jahrhunderts, betrachtet werden. Ausführlich und mit bester Dokumentation wurde dieser Aspekt des Zoologen Spix in einer exzellenten Studie von Bartkowski (1998) dargestellt.

Über Spix' Frühentwicklung ist außer reinen Daten kaum etwas überliefert. Erst nachdem er bereits das Philosophiestudium an der Universität Bamberg als einer der besten Absolventen verlassen und 1801 zum Theologiestudium in das fürstbischöfliche Klerikalseminar zum Guten Hirten in Würzburg eingetreten war, schlägt in diesen bislang so geradlinigen Lebenslauf die Begegnung mit F. W. Schelling (Abb. 1) wie ein Meteor ein, gibt ihm eine ganz andere Richtung, hüllt aber auch auf Jahre hinaus sein Denken – und das einer ganzen Generation deutscher Wissenschaftler – in die Wolken einer Schelling-spezifischen "Natur"-Philosophie. Vorsicht, Schelling hatte einen ganz eigenen Naturbegriff!

Während die heutige Biologie unter Natur etwas zeitabhängig Existierendes versteht, das durch empirische Untersuchung erfaßbar wird, ist Schellings Naturbegriff zeitlos, absolut und nicht selbst-organisierend (Schlemm 1996). In seinem philosophischen Gebäude wird ein Raum erdacht, in den sich die Phänomene der Natur einzupassen haben, Schelling argumentiert uneingeschränkt deduktiv. Sein Erstling, die "Ideen zu einer Philosophie der Natur" erschien 1797. 1803 wird er nach Würzburg berufen. Seine partiell pantheistischen Vorstellungen läuten die Romantik ein und faszinieren den gerade gut 20-jährigen Spix, versprechen sie doch eine wissenschaftliche Erfassung der *ganzen* Welt (Autrum 1983: "... Schelling betonte ... immer wieder, daß das *totum mundi*, die Ganzheit der Welt, in ihren Einzelheiten erscheint und diese in die Einheit des *totum mundi* eingeordnet werden müßten"). Spix provoziert die Relegation vom Priesterseminar und wendet sich mit stürmischer Begeisterung dem Studium der Medizin zu, jenem Fach, das damals die Zoologie einschloß. 1806 promoviert er zum Doktor der Medizin.

Freilich gerät Spix schon als Student in die methodologische Zange zwischen Schellings deduktivem Vorgehen und der konträren, empirisch-induktiven Position. 1803 wurde nämlich an der Universität in Würzburg, damals eine der führenden in Europa, ein weiterer Lehrstuhl neu besetzt, der für Anatomie und Physiologie, und zwar mit dem kompromißlosen Empiriker Ignaz Döllinger. Ferner dürfte Spix zoologische und naturgeschichtliche Vorlesungen "nach Blumenbach" gehört haben (Bartkowski 1998). Und dieser Johann Friedrich Blumenbach markiert mit seinen Einsichten und Überlegungen recht genau den Erkenntnisstand, den zumindest ein Teil der Naturforscher zu Beginn des 19. Jahrhunderts hatten. Er begründet in "Beyträge zur Naturgeschichte" (1806), warum Arten veränderlich sein müssen, er hält für zwingend erwiesen, daß manche Arten neu entstehen und andere aussterben, und daß es vor Erscheinen des Menschen ("präadamitisch") bereits eine belebte Vorwelt gegeben hat; bei den Ursachen der Artbildung (der "Ausartung") führt er "Degeneration" an und schließlich "Clima, ... Nahrung und ... Lebensart". Aber er ahnt, daß diese Einflüsse nicht ausreichen: "daher dann freylich von gar mancherley Phänomenen der Ausartung keine bestimmte Ursache angegeben werden kann".

Das war zu Spix' Zeiten das kulturelle Hauptthema Europas und es krempelte binnen hundert Jahren die wissenschaftliche Welt nicht minder um als es in der Physik Kopernikus getan hatte, und es wirkte – wie bei dessen "Wende" geschehen – tief in die Gesellschaft hinein. Den ersten Meilenstein setzte Carl von Linné, der mit der Einführung der heute noch gültigen binomialen Nomenklatur ("Species Plantarum", 1753) den Verwandtschaftsgedanken verbindlich etablierte, auch wenn er explizit erst 1764/65 von Michel Adanson formuliert wurde ("Les familles des plantes"). Das zweite große Werk, mit dem die Kernfrage, nämlich die nach den Wirkkräften der Evolution im Prinzip – wenn auch nicht in allen Details – beantwortet wurde, legte Charles Darwin 1859 vor: "Origin of species". Spix mischt sich zeitlich und konzeptionell genau in der Mitte zwischen Linné und Darwin in die Debatte ein.

Angestoßen wurde diese international geführte Debatte durch die Philosophie der Aufklärung. Aufgeklärte Herrscher wiederum ermöglichten die erforderlichen wissenschaftlichen Anstrengungen. Spix selbst kennzeichnet diese Jahre in einer Huldigungsadresse an den Grafen Montgelas so: "... zu einer Zeit, wo Liebe zu den Wissenschaften ... auf dem Throne sizt, die Akademien der Wissenschaften ... gegründet hat, und nun auch durch ... Begünstigung der naturgeschichtlichen Kabinette ... dem Genius der Naturwissenschaften ... einen Tempel erbauet ..." Großes Vorbild vieler Fürsten ist (vorübergehend) Napoleon selbst, der z.B. eine 3½-jährige Expedition nach West-Australien unter Nicolas Baudin anordnete, die 1804 mit reicher Ausbeute (allein 2542 bis dahin unbekannte Tierarten) zurückkehrte. Das Material wurde überwiegend im Muséum national d'histoire naturelle in Paris aufgearbeitet, wo neben Jean Baptiste Lamarck vor allem George Cuvier wirkte, und wohin vier Jahre später Spix zu einem ausgedehnten Forschungsaufenthalt reisen sollte.

Cuvier (Abb. 1) begründete – nach Vorarbeiten von Buffon und anderen – die moderne Vergleichende Anatomie, die später in der Auseinandersetzung um den Evolutionsgedanken so viele Argumente liefern würde, er selbst aber hielt die Arten für unveränderlich (im Gegensatz zu anderen, z.B. Blumenbach oder Lamarck) und erklärte den Unter-

  

Abb. 1. J. B. Spix (Mitte) im Spannungsfeld zwischen F. W. Schelling (links) und G. v. Cuvier (rechts). Auf dem Titelblatt und in der Vorrede zur "Geschichte und Beurtheilung aller Systeme ..." stellt Spix sich selbst und seine beiden großen Lehrer mit folgenden Worten vor:

"Schelling, welcher ... die Philosophie ... der Natur wieder anheimgab, und ... den unvergeßlichen Rath ertheilte: mich ... an das offene Buch der Natur selbst zu halten, und so in Allem die Erfahrung zu meiner Gefährtin zu machen."

"J. B. Spix, der Weltweisheit und Arzneikunde Doktor, der mathematisch-physikalischen Klasse der Königl. Baier. Academie der Wissenschaften in München Adjunkt und Conservator der zoologisch-zootomischen Sammlungen".

"Cuvier, welcher der Zoologie, ja selbst der gesammten, Naturgeschichte unserer Zeit durch die Bearbeitung der vergleichenden Anatomie eine ganz neue Richtung gab."

schied zwischen fossiler und rezenter Fauna mit einer – aus heutiger Sicht unhaltbaren – Katastrophentheorie.

Lamarck, der als Systematiker Großartiges geleistet hat, insbesondere bei der Einteilung der Wirbellosen, hatte bereits erkannt, daß es eine Evolution geben muß, hatte sich nur bei der Frage nach ihrer Triebkraft allzu spekulativ festgelegt, bekanntlich auf die Forderung nach der Vererbung erworbener Eigenschaften.

Anders als für heutige Biologen, die unter einem natürlichen System in erster Linie ein phylogenetisches System verstehen und in der Klassifikation der Rezenten einerseits und in der zeitlichen Abfolge von Arten andererseits nur zwei unterschiedliche Projektionen ein und desselben Phänomens sehen, wurden diese beiden Aspekte seinerzeit gerade erst miteinander in Verbindung gebracht. Deutliches Zeichen hierfür ist, daß sich bereits viele um die Integration fossiler Fakten in das System bemühten. Mit seiner ersten großen Buch-Veröffentlichung von 1811 belegt Spix sein mächtiges Interesse am Aufbau eines natürlichen Systems. Darin vergleicht, würdigt und kritisiert er alle biologischen Systeme von Aristoteles bis in seine Zeit.

Aber zunächst einmal hatte er sich nach Abschluß seiner Studien in Bamberg als Arzt niedergelassen. In München berief König Max I. Joseph zur Belebung seiner Akademie der Wissenschaften Schelling. Dessen Einfluß – und wahrscheinlich auch der des Anatomen und Physiologen Soemmering – bewirkte, daß Spix als wissenschaftlicher Angestellter an die zoologisch-zootomische Sammlung nach München geholt und – nach eingehender Eignungsprüfung – zur Erweiterung seiner zoologischen Fähigkeiten mit gut dotiertem Stipendium an den Ort der biologischen Welt-Spitzenforschung, nach Paris geschickt wurde. Dort arbeitet er im Labor von George Cuvier morphologisch und physiologisch – in einem gewissen Sinn sogar elektrophysiologisch – an Aktinien und Seesternen, die damals auf Grund ihrer Rotationssymmetrie noch in einer systematischen Gruppe zusammengefaßt waren, während wir sie heute als zwei weit voneinander getrennte Taxa betrachten. 1809 erscheinen diese Untersuchungen in den Annales d'histoire naturelle. In Paris hört er Vorlesungen von Cuvier, Lamarck und Geoffroy Saint Hilaire.

Nach weiteren Forschungsaufenthalten an der Atlantikküste, in Italien und der Schweiz kehrt Spix nach München zurück und publiziert bald darauf das erwähnte umfangreiche, sehr detaillierte Kompendium der systematischen Ordnung der belebten Welt mit dem Titel "Geschichte und Beurteilung aller Systeme der Zoologie von Aristoteles bis auf unsere Zeit". Er beginnt also seine eigene Arbeit mit einem gründlichen Literaturstudium, um zu sehen, was hat die Wissenschaft zu dieser Frage schon gedacht, wo lagen die Fehler, was hat sich bewährt. Dabei unterscheidet er sehr genau zwischen Entwürfen zu "künstlichen Systemen" und dem angestrebten "natürlichen". Künstlich nennt er (wie andere vor und mit ihm) jeden Entwurf, bei dem die Vielfalt auf Grund eines einzigen Kriteriums dichotom geteilt wird, z.B. in Tiere mit und ohne Blut. Das Ideal, ein in seinem Sinne "natürliches" System hingegen bezieht alle (realistischerweise möglichst viele) relevanten Merkmale ein. In der das Buch abschließenden Sentenz äußert er sich zuversichtlich über die Integrierbarkeit fossiler Formen in ein Rezentensystem: "Allein auch diese Denkmäler der alten Geschichte werden, jemehr die Schichten unseres Erdplaneten und ihre gesetzmäßige Aufeinanderfolge durch das geologische Studium ausgemittelt ist, noch ganz entziffert werden, und sie werden darthun, daß auch in dem fossilen Vorkommen der Thiere vom Zoophyten im ältesten Flötzgebirge an bis zu Katzen, Hunden, Bären in verschütteten Höhlen, den Schichten der Erde parallel die nämliche Stuffenfolge herrscht, als diese göttliche architektonische Kunst der Natur durch vergleichende Anatomie und Zoologie an den noch lebenden Tieren hergestellt werden kann."

Daß die Schaffung eines natürlichen Systems einen umfassenden Einblick in die weltweite Artenvielfalt voraussetzt, ist ihm klar. Daß die vorhandenen Bestände der Münchner Sammlung dazu viel zu lückenhaft sind, ist ihm, nachdem er die Sammlung in Paris kennengelernt hat, erst recht klar. Das mag einer der Gründe sein, warum er schon früh Pläne entwickelt, durch eine eigene große Forschungsreise mit exotischem Ziel diesem Münchner Mangel abzuhelfen.

Aber vorerst ist eine große Expedition nicht finanzierbar. Deshalb bemüht er sich, dem zugänglichen Material das Optimale abzugewinnen. Er vertieft sich "zootomisch" in die Strukturen des Blutegels, er vergleicht die Primaten der Alten Welt mit denen der Neuen und befaßt sich mit den Fossilien der Solnhofener Plattenkalke. Schließlich realisiert er ein Mammutwerk zum Thema der Cephalisation und deren Erkennbarkeit aus dem Bau der Schädel, die "Cephalogenesis" von 1815. Diese Arbeit spiegelt einerseits unverkennbar die Einflüsse Cuviers wieder, zeigt aber andererseits noch einmal sehr deutlich Spix' Befangenheit in der Naturphilosophie Schellings und besonders in der von Lorenz Oken.

Oken war während Spix' Würzburger Jahre Mitarbeiter von Döllinger und gleichzeitig in regem Gedankenaustausch mit Schelling. Seine Biographie führte ihn zwar von Würzburg zunächst einmal nach Göttingen und Jena, wo er u.a. physiologische und naturphilosophische Vorlesungen hielt, und erst 1821 nach München. Aber die Verbindung zu Spix bestand wohl während all dieser Jahre. Oken hatte nun in der Jenenser Antrittsvorlesung seine Wirbeltheorie des Schädels vorgestellt (wir würden statt von Theorie eher von Hypothese sprechen). Der Gedanke, den Schädel von drei Wirbeln abzuleiten, muß in der Luft gelegen sein – Goethe sprach ihn schon 1790 aus (und stritt sich dann mit Oken um die Priorität) – aber der Gedanke war noch nicht gründlich mit vergleichend anatomischen Tatsachen konfrontiert worden. Diesem Mangel hilft nun Spix ab durch höchst akkurate Untersuchungen an 102 verschiedenen Tierschädeln, gezeichnet aus verschiedenen Blickwinkeln, sowohl ganz als auch in Teilen, ja er bezieht schließlich auch Wirbellose, speziell Arthropoden mit ein. Am hohen Wert dieser Materialsammlung und -dokumentation bemißt sich die Wertschätzung, die das Buch weithin findet. Sogar Goethe, der mit Spix' Schlußfolgerungen nicht einverstanden ist, würdigt es als Prachtband. Bei manchen stoßen aber die inhaltlichen Aussagen der Cephalogenesis auf starke Ablehnung. Insbesondere Soemmering moniert, daß in der Cephalogenesis "Genesis" weder ontogenetische noch phylogenetische Entstehung bedeutet, sondern die jeweils art-spezifische konkrete Ausformung einer einheitlichen Idee. Die Interpretation des Materials erfolgt rein naturphilosophisch, die realen Befunde werden im Lichte einer vorgegebenen Idee betrachtet. Andererseits zeigt aber Spix' Arbeit eine solch akribische Bemühung um die empirischen Fakten, daß man das Werk auch so interpretieren kann: eine *a-priori*-Idee wird als heuristisches Prinzip in Dienst gestellt. Freilich behält Spix wesentliche Vorgaben der Schelling-Oken'schen Philosophie bei und arbeitet sie konsequent durch. Neben der Wirbelhypothese des Schädels ist das vor allem das so genannte Vervollkommnungsprinzip. Schließlich erliegt Spix sogar der Faszination der Zahlenmystik eines dreigliedrigen Typus der Welt / des Körpers / des Schädels, eine Mystik, die bei Oken regelrecht religiöse Züge trägt: "Das Wesen des Alls besteht in der Dreiheit, welche Einheit ist, und in der Einheit, welche Dreiheit ist" (zitiert nach Bartkowski S. 303).

1817 endlich, als Spix schon ein anerkannter Forscher war, der mit den größten Koryphäen seiner Zeit in Gedankenaustausch stand, bot sich überraschend die Gelegenheit zur großen Brasilienreise.

Bekanntlich bringen Spix und Martius von dieser Reise höchst wertvolles zoologisches, botanisches, ethnologisches und geographisches Material in bestem Zustand nach München. Allein der ungeheure Umfang des Materials belegt die Arbeitswut und Selbstaufopferung der beiden. Spix trägt eine zehrende fiebrige Tropenkrankheit (E. J. Fittkau vermutet eine Trypanosomiasis, die Chagas-Krankheit) in sich, von der er sich nicht mehr erholen wird. In stark geschwächtem Zustand verbleiben ihm noch knapp 5 Lebensjahre, um das Material zu versorgen, zu sichten, zu ordnen, zu beschreiben und zu publizieren, vor allem aber, um jene Informationen herauszudestillieren, die dieses Material zu den Fragen nach dem natürlichen System und zur Herkunft der Artenvielfalt hätte ihm an die Hand geben können.

Ein anderer berühmter Forscher, der ebenfalls mit gewaltiger Ausbeute von einer berühmten Reise in die Tropen zurückgekehrt war, benötigte 20 Jahre zur Bearbeitung seines Materials und schreibt darüber: "Nach meiner Rückkehr ... begann ich mein erstes Notizbuch für Tatsachen in Bezug auf den Ursprung der Arten, worüber ich lange nachgedacht hatte, und hörte während der nächsten 20 Jahre nicht auf, daran zu arbeiten." Soweit Charles Darwin (zitiert nach Autrum 1967). Spix, der 18 Jahre früher vor einem vergleichbaren Materialberg saß, fehlte die nötige Zeit. Hätte er vielleicht vor Darwin die entscheidenden Einsichten gewonnen? Wäre er zum Vater der modernen Evolutionsforschung geworden?

Das weiß selbstverständlich niemand. Auch drängt sich die Frage auf, ob ihm die Prägung durch die Naturphilosophie Schellings den Blickwinkel nicht doch zu sehr eingeengt hatte. Es gibt gute Hinweise, daß er sich davon freizumachen verstand; immerhin definiert er schon 1811 die Aufgaben des Philosophen und des Naturforschers ganz unterschiedlich: "... (sie) sollen ganz gesondert den Weg ihrer Forschungen gehen; dieser soll rein und gewissenhaft beobachten und experimentieren, dann die, aus der Menge ähnlicher Fakten – aus der Analogie – sich ergebenden Schlüsse ziehen; jener aber soll die Beobachtungen des Naturforschers über das Physische und Psychische in Saft und Blut verwandeln, und indem er die zu Grunde liegenden Gesetze als solche, gleichsam als das Ideal der Natur, Kunst und Wissenschaft, aus der concreten Welt heraushebt, das Allgemeine (*a priori*) in dem Besonderen (*a posteriori*) nachweisend bekräftigen, und so die Philosophie selbst als eine blos beschauliche Beobachtung der Natur darthun" (Spix 1811). H. Autrum, ein profunder Kenner der Zoologie ebenso wie der Wissenschaftsgeschichte, nimmt an, "Spix ... wäre wohl in der Lage gewesen, beides, Philosophie und konkrete Forschung, in ausgewogener Weise zu verbinden" (Autrum 1983). Aber diesem stürmischen Wissenschaftlerleben war die Vollendung nicht vergönnt. Dennoch war Johann Baptist Ritter von Spix einer der ganz großen Biologen seiner Zeit. Die Zoologische Staatssammlung München kann auf diesen Gründungsvater stolz sein.

Als er am 13. Mai 1826 stirbt, erfüllt sich an ihm auf tragische Weise jenes Cicero-Wort, das er seinem großen Werk über den Vergleich aller früheren Versuche einer zoologischen Systemfindung zuversichtlich vorangestellt hatte:

"aggredior non tam perficiendi spe,
quam experiendi voluptate"

Ich gehe es an –
nicht so sehr in der Hoffnung auf Vollendung
als um der Lust an der Erfahrung willen.

Literatur

Adanson, M. 1763/64. Les familles de plantes. – Paris.

Autrum, H. 1967. Jean Baptiste de Lamarck und Charles Darwin. – In: Der Natur die Zunge lösen – Leben und Leistung großer Forscher. Hrsg. W. Gerlach. – Ehrenwirt München: 109-121

– – 1983. Ritter von Spix, der Münchner Zoologe. Hrsg. E. J. Fittkau. – Spixiana, Suppl. **9**: 19-21

Bartkowski, B. 1998. Das Tierreich als Organismus bei Johann Baptist von Spix (1781-1826). Seine Auseinandersetzung mit der Mannigfaltigkeit im Tierreich: Das "natürliche" System. – Peter Lang, Europ. Verlag der Wiss., Frankfurt et al.

Blumenbach, J. F. 1806. Beyträge zur Naturgeschichte. – Göttingen, bey Heinrich Dieterich

Darwin, C. R. 1859. On the origin of species by means of natural selection, ort he proservation of favoured races in the struggle for life. – London

Fittkau, E. J. 1981. Münchens erster Zoologe, Johann Baptist Ritter von Spix, 1781-1826. – Jb. Bayer. Akad. Wiss. München: 57-60

– – 1995. Johann Baptist Ritter von Spix. – In: Rundgespräche der Kommission für Ökologie, Bd. 10 "Tropenforschung". – München: 29-38

Linné, C. v. 1753. Species plantarum. – Stockholm

Schlemm, A. 1996. Schelling und der Entwicklungsgedanke. In: Annettes Philosophenstübchen © 1996/98 – http://www.thur.de/philo/as224.htm

Spix, J. B. 1809. Mémoire pour servir à l'histoire de l'asterie rouge, *asterias rubens*, Linn.; de l'actinie coriacée, *actinia coreacea*, Cuv. ; et de l'*alcyon exos*. – Ann. Mus. Hist. nat. Paris **13**: 438-459

– – 1811. Geschichte und Beurtheilung aller Systeme in der Zoologie nach ihrer Entwicklungsfolge von Aristoteles bis auf die gegenwärtige Zeit. – Nürnberg

– – 1815. Cephalogenesis sive Capitis Ossei Structura, Formatio et Significatio per omnes Animalium Classes ... derivatae. – Typis Francisci Seraphici Hübschmanni, Monachii: 11 u. 72 pp.

Tiefenbacher, L. 1983. Die Brasilienexpedition von J. B. v. Spix und C. F. Ph. v. Martius in den Jahren 1817 bis 1820. Ein Abriß. – Spixiana Suppl. **9**: 35-42

11. Bellmann, H.: Der neue Kosmos Schmetterlingsführer. – Kosmos Verlag, Stuttgart, 2003. 445 S., über 1100 Farbfotos, paperback. ISBN 3-440-09330-1.

Bestimmungsführer von Schmetterlingen gibt es viele. Das vorliegende Werk ist jedoch von ganz besonderer Art: In unglaublich schönen Farbfotos von berauschender Qualität (die allermeisten stammen vom Autor selbst) werden nicht nur über 300 Schmetterlingsarten, sondern meist auch deren Larvalstadien (Ei, Raupe, Puppe) und – zusammengefaßt in einem separaten Teil des Buches, deren Futterpflanzen vorgestellt. Der Schwerpunkt liegt hierbei auf der Fauna und Flora Mitteleuropas, jedoch wurden auch einige auffällige südeuropäische Arten in das Werk mitaufgenommen.

Das völlig neuartige, Falter, Larvalstadien und Pflanzen umfassende Konzept ist nicht nur im Freiland oft sehr praktisch, sondern fördert zudem ein integratives Denken, das sich über die Zusammenhänge in Ökosystemen klar wird. Sinnvoller Naturschutz besteht ja gerade darin, daß man nicht Teile der Natur isoliert betrachtet. Folge solch schubladenhafter Herangehensweise ist dann z.B. der derzeit von der Artenschutzgesetzgebung praktizierte, unsinnige Schutz von Schmetterlingen gegenüber Besammelung statt einem wirkungsvollen Erhalt der Lebensräume mit reichhaltigem Angebot der Lebensgrundlagen und intaktem und diversem Gefüge von Pflanzen und Tierbeständen.

Die Begleittexte sind durchaus informativ, genügen durchaus wissenschaftlichen Ansprüchen und gehen – anders als in vielen anderen Bestimmungsführern – über das Notwendigste weit hinaus. Die Schriftgröße wurde daher sehr klein gewählt und mag vielleicht für den einen oder anderen die Lesbarkeit ein wenig beeinträchtigen. Ansonsten ist das Buch sehr übersichtlich aufgemacht, durch Farbcodes auf den Kopfzeilen der Seite findet man schnell bestimmte Schmetterlingsgruppen, eine Leiste mit graphischer Darstellung der Phänologie (Falter – Raupe) vermittelt einen sofortigen Eindruck der Erscheinungsweise. Tiere und Pflanzen sind durchweg mit deutschen und lateinischen Namen nach moderner Nomenklatur bezeichnet. Das Lektorat war hervorragend und so sind so gut wie keine Fehler zu finden. In den Buchklappen findet der Leser 6 Farbtafeln mit 45 Fotos von Raupentypen, die es bei den Großschmetterlingen in den allermeisten Fällen erlauben werden, eine Zuordnung einer im Freiland gefundenen Raupe zur zugehörigen Familie vorzunehmen.

Dem Verlag ist nur zu gratulieren, mit diesem Buch für die breite Öffentlichkeit einen wertvollen Beitrag zur Bildung und Naturbewußtsein geleistet zu haben. Angesichts des günstigen Preises ist davon auszugehen, daß sich das Buch einer breiten Leserschaft erfreuen wird. Dem Autor sei zu danken, sein Fachwissen und sein exzellentes naturfotographisches Geschick der Allgemeinheit zur Verfügung gestellt zu haben.

A. Hausmann

12. Schatanek, V. & H. Elkharassi: Sahara – Tiere, Pflanzen, Spuren. Kosmos Naturführer. – Franckh-Kosmos-Verlags-GmbH & Co. KG, Stuttgart, 2006. 331 S. ISBN 3-440-10449-4.

2006, das von der UNO ausgerufene Jahr der Wüsten, wobei es dabei primär um die Warnung vor dem Voranschreiten der Wüsten weltweit geht, lenkt den Blick aber auch auf eine faszinierende Landschaft, der auch das vorliegende Bändchen Rechnung zollt. Dargestellt wird die Sahara als größte Wüste der Erde nicht nur mit der Problematik der dort lebenden Bevölkerung und ihren Überlebensstrategien, sondern auch mit ihren beeindruckenden Landschaften, die lebensfeindlich erscheinen, aber selbst dann eine überraschend reichhaltige Fauna und Flora beherbergen. Diesen räumt das Buch größeren Raum ein, wobei die einzelnen Arten, besonders die der Pflanzen, ausführlich beschrieben und bildlich dargestellt werden. Neben diesen werden auch verwandte Arten erwähnt und ihre Merkmale hervorgehoben. Dies gilt auch für die Tiere, bei denen jedoch nur sehr exemplarisch einige auffällige Vertreter vorgestellt werden. Dies trägt dem Umstand Rechnung, daß viele der Tiere für den Wüstenbesucher kaum zu sehen sind, da diese meist nachtaktiv und tags in Höhlen oder im Sand eingegraben ruhen. Dem Bildtafelteil vorangestellt ist jeweils eine anschauliche Erklärung, welche Eigenschaften die Organismen haben müssen, um in der Wüste überleben zu können. Die Tierkapitel sind nach Gruppen geordnet und mit Geschichten versehen, wie sie von den Wüstenvölkern erzählt werden. Eine nette Auflockerung, auf die aber die Hinweise fehlen (Inhalt). Allgemein kommen die zahllosen Kleintiere, denen auch der Tourist begegnet, etwas zu kurz. Es folgt ein umfangreicherer Teil der Tierspuren mit umfassenden Erklärungen.

Diesem Hauptteil dieses Sahara-Führers sind Angaben zur Geographie, zum Klima, zur Besiedlung dieses Areals in vorgeschichtlicher Zeit, den heutigen Menschen, die hier leben, und den Berbertraditionen gewidmet. Dabei werden kurz die wesentlichen Kriterien vorgestellt, begleitet von eindrucksvollen Bildern, die selbst keine Legenden besitzen, sondern im Text durch Ziffern markiert werden, was bei der Zuordnung etwas Mühe bereitet. Einige der Landschaftsformen hätte der Leser sicher gern genauer bezeichnet gefunden. Die Hinweise im Kapitel "Unterwegs in der Sahara" sind für Besucher eine wichtige Orientierungshilfe, legen jedoch nicht das Problem des Tourismus in dieser hochsensiblen Region offen. Ansonsten ist dieser Band der beiden Autoren gelungen, auch wenn man zur Tierwelt etwas mehr erwartet hätte. Für jeden Interessierten ist dies eine willkommene Zusammenstellung mit sonst selten zu findenden Hinweisen. Daß nur zwei Reiseanbieter von Touren in und durch die Sahara erwähnt werden, verhindert den Wettbewerb. Der Verlag hätte gut daran getan, diese wegzulassen.

E.-G. Burmeister

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Proceedings of the Forum Herbulot 2006 Integration of molecular, ecological and morphological data: Recent progress towards the higher classification of the Geometridae (Hobart, 19-20 January 2006)

Axel Hausmann & Peter McQuillan (eds.)

Hausmann, A. & P. McQuillan (eds.) (2006): Proceedings of the Forum Herbulot 2006; Integration of molecular, ecological and morphological data: Recent progress towards the higher classification of the Geometridae (Hobart, 19-20 January 2006). – Spixiana **29/3:** 199-216

The Forum Herbulot 2006 in Hobart, Tasmania was focussed on the establishment of an integrated taxonomical approach in geometridology, including morphological and molecular techniques as well as data from biogeography and ecology. In fourteen lectures and five posters various studies and results on geometrid moths were presented using a wide range of different techniques. Extensive discussions helped to put these studies into a common context, and to plan integrative approaches and cooperations for the future.

Dr. Axel Hausmann, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany; e-mail: Axel.Hausmann@zsm.mwn.de

Dr. Peter B. McQuillan, School of Geography and Environmental Studies, University of Tasmania, Hobart; e-mail: P.B.McQuillan@utas.edu.au

Short Report and Results

Axel Hausmann, Martin Krüger, Peter McQuillan, Manfred Sommerer & Cathy Young

Hausmann, A., Krüger, M., McQuillan, P., Sommerer, M. & C. Young (2006): Short report and results. In Hausmann, A. & McQuillan, P. (ed.): Proceedings of the Forum Herbulot 2006; Integration of molecular, ecological and morphological data: Recent progress towards the higher classification of the Geometridae (Hobart, 19-20 January 2006). – Spixiana **29/3:** 199-200

Corresponding author: Dr. Axel Hausmann, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany;
e-mail: Axel.Hausmann@zsm.mwn.de

1. The chairmen outlined once more the aims of the FORUM HERBULOT (see www.herbulot.de). After a brief inaugural address from Claude Herbulot, Paris (presented *in absentia* by Axel Hausmann), the participants welcomed the research initiative and stressed the need for, and advantages of, the opportunities offered for close scientific cooperation among geometrid experts.

2. The seminar session highlighted promising possibilities for systematic research. The first five talks (session on 'Biosystematics & Phylogeny': S.-W. Choi, J. Viidalepp, E. Õunap, C. Young, P. McQuillan) presented and summarised the actual stage of research concerning the phylogeny of Geometridae on the subfamily and tribal levels as resulting from different types of data sets, such as larval morphology (Viidalepp), adult morphology (all), host-plant relationships and zoogeographical patterns (McQuillan), and molecular analysis (Young, McQuillan, Õunap). The results focussed on Larentiinae (Choi, Viidalepp, McQuillan), but also offered deeper insights into the Geometrinae (Young) and the Sterrhinae (Õunap). Various different molecular data sets, derived from different nDNA and mtDNA genes, suggest a basal position of the Larentiinae within geometrid phylogeny (Õunap, Young). These results led to an extensive discussion of various possible scenarios in the evolution of this family.

In the session on 'Biogeography' distribution patterns were used to analyze refuges of Palaeogenic elements within the southern African geometrid fauna (M. Krüger), and to discuss taxonomy of great variation between island races (D. Stüning). In addition, diversity and phenology patterns in coastal Queensland were presented (P. Mackey).

The third session on 'Informatics and methodology' emphasized the importance of modern IT-based information systems to geometrid workers (African Geometridae: H. Staude; type specimens: A. Hausmann), of a new application of molecular techniques in ecosystem research (Hausmann) and of a new method for the study of egg morphology (Hausmann). Cooperation was agreed upon to collect and exchange digital images of, and information on, type specimens.

Refinement of molecular methods as valuable tools for evolutionary and systematic studies had been postulated by the previous Forum Herbulot 2001 and Forum Herbulot 2003 in order to supplement morphological and ecological data sets. Now, the first results of the four 'molecular' groups currently working on Geometridae, i.e. C. Young / P. McQuillan (Tasmania), E. Õunap / J. Viidalepp / U. Saarma (Estonia), A. Hausmann / S. Erlacher / M. Miller (Germany), T. Tammaru / N. Snäll (Estonia-Finland), offer a promising basis for future research. Closer cooperation in collecting and exchange of DNA samples was agreed upon, such as the coordinated use of techniques and target genes. Working plans were established in order to focus future common research on a better understanding of the basic phylogeny of Geometridae.

A statement of P. Sihvonen (Finland) with a number of theses for improvement of research coordination was distributed and welcomed. A common project could disclose and verify, in an integrated taxonomic approach, the relationships of the geometrids of Tasmania (C. Young / P. McQuillan), Chile (A. Hausmann), and South Africa (M. Krüger) ('southern clades').

Structure of, and access to, the Forum Herbulot webpage (www.herbulot.de) was discussed and open access to the 'scientific tools' emerged as the favoured option. The structure of the site will be changed in the course of 2006. The number of available type images of Geometridae will be restricted, but updated full versions of the type databases will be distributed to the active FH members in 2-year-intervals, at the FH meetings.

3. FORUM HERBULOT 2006 offered a very well organised post-conference tour in the South of the island. This tour and the collecting activities during the meeting brought very good results, and more than 130 of the 310 known Tasmanian geometrids could be recorded. Special tissue samples were collected for DNA analysis and common projects were planned. The results are presented and documented on the homepage (www.herbulot.de).

4. When receiving the sad message that Claude Herbulot passed away at the day of the opening of the Forum Herbulot 2006, the participants expressed their deep respect for the scientific achievements of the grandmaster of geometridology and patron of the Forum.

5. A proposal to have the next FORUM HERBULOT in Munich, Germany, in early 2008 (organisation: A. Hausmann) was discussed and welcomed. Future venues were proposed by the museums in Pretoria (South Africa) and Gainesville (Florida, U.S.A.). These offers were generally much appreciated by the participants.

6. Participants expressed their thanks to the organizers and sponsors of the FORUM HERBULOT 2006.

Hobart, 24.1.2006

Dr. A. Hausmann (ZSM, Munich, D)
Dr. M. Krüger (Transvaal Mus., Pretoria, RSA)
Prof. Dr. P. McQuillan (Univ. Hobart, Tasmania, AUS)
Manfred Sommerer (Munich, D)
Dr. C. Young (Dept Primary Industries, Water and Environment Hobart)

Abstracts and brief versions of the talks of the Seminar Session

Cladistic analysis of the tribe Xanthorhoini in the Holarctic region (Lepidoptera, Geometridae)

Sei-Woong Choi

Choi, S.-W. (2006): Cladistic analysis of the tribe Xanthorhoini (Lepidoptera: Geometridae) in the Holarctic region. – Spixiana **29/3:** 201-202

Dr. Sei-Woong Choi, Department of Environmental Education, Mokpo National University, Muan-gun, Jeonnam 534-729, South Korea; e-mail: choisw@mokpo.ac.kr

The tribe Xanthorhoini, a tribe of the Larentiinae, is a group of small to middle geometrid moths comprising more than 16 genera over the World. Previous studies indicated that this group is more or less a natural taxon, but the monophyly of the tribe is not clearly defined and this resulted in the ambiguity of the phylogenetic relationships. Two diagnostic characters for the tribe were recognized: a large pair of coremata just distal to the 8th segment in the male abdomen, and the presence of a 'calcar' in male genitalia.

The purpose of the present study is to define the monophyly of the tribe and certain subgroups and to reveal the phylogenetic relationships among genera in the Holarctic region. Fifty-nine morphological characters from head, body, wing and male and female genitalia were analysed. Thirty-eight ingroup taxa were selected – 28 species from the Palearctic, 6 species from the Nearctic and 4 species common in both Palearctic and Nearctic regions. A parsimony software package 'Winclada' (ver. 1.00.08; K. Nixon, 1999) was implemented for finding

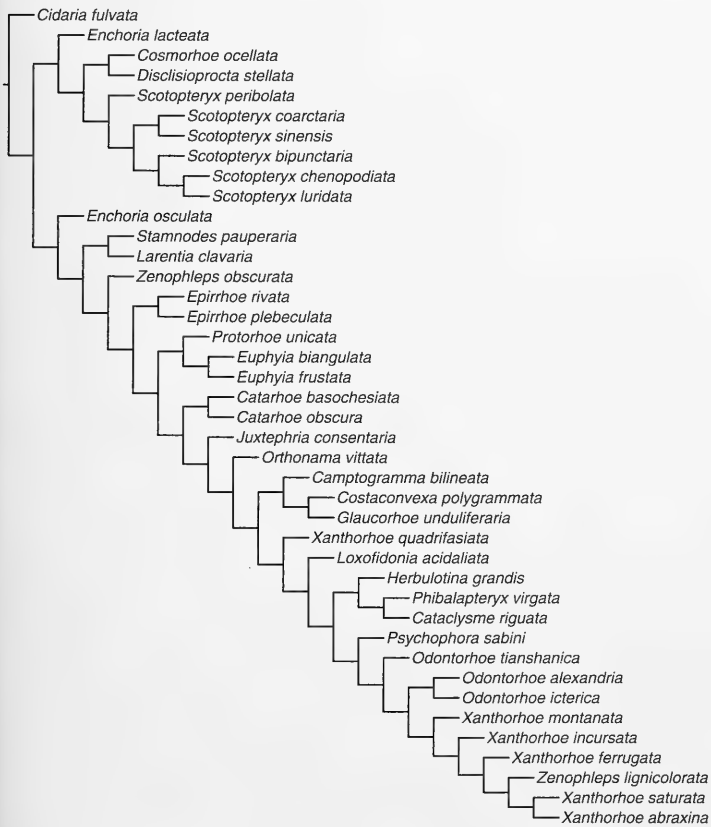

Fig. 1. Most parsimonious cladogram of 38 putative Xanthorhoini species and 3 outgroup taxa (see text).

the most parsimonious cladogram. Three outgroup taxa, *Cidaria fulvata*, *Stamnodes pauperaria*, and *Larentia clavaria* were chosen for rooting the cladograms.

One most parsimonious cladogram was found (L=452, ci=0.21, ri=0.47). However, the resulting cladogram (Fig. 1) is divided into two clades and does not support the monophyly of the Xanthorhoini. In the cladogram, *Scotopteryx*, *Epirrhoe*, and *Euphyia* were monophyletic, while *Enchoria*, *Zenophleps*, *Odontorhoe*, and *Xanthorhoe* were not monophyletic. Overlapping the character 'presence and length of coremata' with the most parsimonious cladogram showed that two states, long and short coremata, occurred independently in different clades and the state, long coremata, occurred three times independently in the cladogram. The overlap of the character 'presence of calcar' with the cladogram showed that the transition from the large, expanded shape of calcar to the digitate and relatively short calcar occurred three times independently. The future study including taxon sampling from the Nearctic region and character analysis from immature stages will reveal the monophyly of the Xanthorhoini and provide refined information on relationships among ingroup taxa.

Cladistic analysis of the subfamily Larentiinae

Jaan Viidalepp

Viidalepp, J. (2006): Cladistic analysis of the subfamily Larentiinae. – Spixiana **29/3:** 202-203

Dr. Jaan Viidalepp, Institute of Agronomy and Environmental studies, Estonian University of Life Sciences; e-mail: jaan@zbi.ee

Altogether about 230 species from 125 mostly Holarctic larentiine genera were studied preliminarily, checking the relations between traditionally recognized tribes. Synapomorphies of main generic clades are coded in the final matrix. Forty-six ingroup taxa and *Idaea aversata* (Linnaeus, 1758) as an outgroup species were included, 129 characters coded as unordered by convenience. The parsimony analysis using the application of Hennig86 yielded one weighted tree of 795 steps length, with consistency index, ci=0,72 and rescaled consistency index, ri=0,89. 17 suprageneric groups are supported by synapomorphic characters.

Synthesis. The monophyly of generic groups is analyzed using cladistic methodology, the sequence of resulting clades is defined by other means.

Larval chaetotaxy is studied fragmentarily. However, the Eudulini, Operophterini, Asthenini, Rheumapterini a.s.o. to the Eupitheciini, Chesiadini and Trichopterygini (cf. Table 1) bear four secondary setae laterally on the prolegs. The Lythriini, Xanthorhoini, Stamnodini, Larentiini and Hydriomenini have eight or more, the Euphyiini and Cidariini five or six secondary setae (according to literature, and original data). It is merely to decide which state of this character is primitive, and which is derived.

Males in three tribes, the Xanthorhoini, Cataclysmini and Euphyiini, have large coremata associated with membranization of last but one and last abdominal segments. In the Eupitheciini, the coremata are attached to the ninth segment and the male eighth sternite is specialized to open the female colliculum during the early phase of copulation (Mikkola 1994). The structures are not homologous, as well as the presence of two pairs of coremata on the male eighth abdominal segment in some Rheumapterini, and their sporadical occurrence in scattered cidariine and asthenine genera, judged by the differences in sclerotization of last abdominal segments.

The labides are present in several clades. The valvae often are ornamented and projecting distally at dorsal or ventral margin, or on both; only in the Chesiadini, the presence of a harpe is more or less constant.

A peculiar, *Eupithecia*-type of ornamentation of female bursa copulatrix with numerous spines having star-shaped or petaloid bases, is observed within Geometridae only in some tribes of Larentiinae and in some species-groups of the sterrhine genus *Idaea*. If the groups with the *Eupithecia*-type of bursa ornamentation are relatively derived, the groups with four secondary setae laterally on the larval prolegs are to be grouped with Eupitheciini, and the larger number of setae on the prolegs results to be less derived. An early analysis of Kuznetsov (1969), based on food-plant associations of tortricids, has shown the leading evolutionary trend from detritophagy to leaf-eating and further to antho- and carpophagy. The Perizomini are anthophagous, the Eupitheciini are antho- and carpophagous.

The same way, labides, branching from base of costa towards juxta and tegumen, more often occur in groups with four secondary setae on the larval prolegs. Labides are not derived in Chesiadini, and Trichopterygini, which have four secondary setae on the larval prolegs. However, a long dorsal projection from the valve costa base is present in both mentioned tribes: a precursor of labides? Labides as dorsal appendages of juxta characterize tribes with relatively more setose larvae.

The deduction of listed morphological peculiarities justifies the presented model of the arrangement and order of tribes within the subfamily Larentiinae, from the Lythriini, Cataclysmini and Xanthorhoini to the Eupitheciini and Trichopterygini (Tab. 1). The results also indicate directions for further study.

How to check the results of cladistic analysis of morphological datasets?

Molecular systematics up to now have provided much smaller data-sets than classical morphology, but it will allow to infer a large quantity of data which, analyzed by means of comparable methods, will conquer with, or complement the results obtained by morphological analyses in future.

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References

Kuznetsov, V. I. 1969. [Ecological connexions of Tortricidae with vegetation of Far East. – Papers presented on XXI yearly readings in memory of N. A. Kholodkovsky.] Leningrad: 27-52 (in Russian)

Mikkola, K. 1994. Inferences about the function of genitalia in the genus *Eupithecia*, with description of a new organ. – Nota lepid., Suppl. **5**: 73-78

Tab. 1. Estimating the sequence of tribes within the subfamily Larentiinae. Characters: 1, Star-shaped or petaloid signa in female bursa: present or absent; 2, Number of secondary setae on ventral proleg of mature larva; 3, The presence of hairy "labides" in the anellus region of male genital armature; 4, "Labides" arising from dorsal or lateral margin of juxta; 5, "labides" arising from the base of valve costa; 6, The base of valve costa with a long, simple projection bent dorsad

Tribes/characters	1	2	3	4	5	6
Lythriini		13-14				
Cataclysmini		?				
Xanthorhoini		8-10	labides	from juxta		
Larentiini		8-14				
Euphyiini		5-6				
Hydriomenini		12-18	labides	from juxta		
Stamnodini		11-18				
Cidariini		5-6	labides	from juxta		
Eudulini		4				
Operophterini		4	labides	from juxta		
Rheumapterini		4	labides		from valva	
Triphosini		4	labides		from valva	
Phileremini		4	labides		from valva	
Melanthiini	present +/–	4	labides	from juxta	from valva	
Asthenini	present –/+	4-5	labides	from juxta	from valva	simple
Perizomini		?	labides		from valva	
Eupitheciini	present	4	labides		from valva	
Chesiadini	present	4				simple
Trichopterygini	present	4				simple

Preliminary insight into the molecular phylogeny of Sterrhinae

Erki Õunap, Jaan Viidalepp & Urmas Saarma

Õunap, E., J. Viidalepp & U. Saarma (2006): Preliminary insight into the molecular phylogeny of Sterrhinae. – Spixiana **29/3:** 204

Corresponding author: Erki Õunap, Institute of Zoology and Hydrobiology, University of Tartu, Vanemuise 46, 51014 Tartu, Estonia; e-mail: erkio@ut.ee

Phylogeny of Geometridae in general and Sterrhinae in particular has significantly improved during the last two decades (e.g. Holloway 1994, 1996, 1997, Abraham et al. 2001, Sihvonen & Kaila 2004, Sihvonen 2005). Most of the recent studies on the phylogeny of Geometridae have been conducted primarily on the basis of morphological characters, and only few studies based on the molecular data are available (Abraham et al. 2001, Snäll et al. in press). As several recent findings are in conflict, further research in this area is highly recommended.

We have focussed on resolving the molecular phylogeny of geometrid subfamily Sterrhinae, which comprises more than 110 genera in at least seven tribes. 1530 bp fragment of the mitochondrial cytochrome oxidase gene subunit I was obtained for 28 sterrhine species belonging to nine genera and five tribes. In addition, the same gene fragment was sequenced from six other geometrids belonging to subfamilies Archiearinae, Geometrinae and Larentiinae, and one drepanid and one noctuid species, which were used as outgroups in phylogenetic analysis. Bayesian phylogenetic analysis of nucleotide data revealed that Sterrhinae is a monophyletic entity, but its exact position in the family Geometridae as well as relationships with other geometrid subfamilies remained unresolved. Two earlier expected evolutionary lineages, "Timandrini lineage" and "Scopulini lineage" within Sterrhinae were approved, as well as the monophyly of most tribes. Since nucleotide variation was too high for MP analysis, amino acid data of COI gene were used for phylogenetic inference instead. MP analysis revealed a phylogenetic tree almost identical to the one obtained by Bayesian analysis, but with poor support in several critical nodes. The results are therefore considered preliminary and final conclusions on the phylogeny of Sterrhinae require additional research.

Evolutionary Relationships of the Emerald Moths of Australia

Catherine J. Young & Peter B. McQuillan

Young, C. J. & P. B. McQuillan (2006): Evolutionary Relationships of the Emerald Moths of Australia. – Spixiana **29/3:** 204-205

Corresponding author: Dr. Catherine J. Young, School of Geography and Environmental Studies, University of Tasmania, Locked Bag 78, GPO Hobart, 7001, Tasmania; e-mail: Cathy.Young@dpiwe.tas.gov.au

The emerald moths, or Geometrinae, comprise one of the six sub-families of the Geometridae (Lepidoptera) and, worldwide, include around 2300 species in 250 genera. They are well-known and recognised by their beautiful green wing colour and slender bodies. The Australian fauna is estimated at 350 species and is diverse in forests and myrtaceous heathlands, but with some unusual arid zone endemics as well.

Australia, with Africa, is the only continent lacking a modern treatment of the Geometrinae and A. J. Turner last reviewed the fauna in 1922. Australia is the centre of diversity for an interesting sub-set of the emeralds, the so-called 'greys', recogniseable by their mostly dull colouration and robust bodies. This tribe of the Geometrinae, the Pseudoterpnini, may be pivotal in understanding the evolutionary relationships of the sub-family.

This study builds on a recent large systematic study of the Australian Geometridae. We explore relationships suggested by the latter study between the 'greys' and the 'greens' and also the Geometrinae and other geometrid sub-families.

Fragments of the nuclear genes 28S D2 and LW Rhodopsin were used to construct a phylogeny for the sub-family. To date approximately 50 taxa have been sequenced for 28S D2, including 15 outgroup and sister group taxa, and a smaller subset of 22 taxa with 4 outgroups, has been sequenced for the LW Rhodopsin fragment. Both trees were well resolved and many clades well supported. Some of the supported relationships obtained, so far, from this molecular analysis are as follows:

1. The Geometrinae is monophyletic apart from *Anomogenes*, a 'grey' geometrine (Pseudopterpnini), which forms a clade with the Boarmiini using 28S D2 data;
2. The Pseudopterpnini, apart from *Anomogenes*, forms a clade within the Geometrinae;
3. *Oenochlora imperialis*, a large emerald, that occurs in sub-tropical Australia is well supported as having basally derived characters in the Geometrinae;
4. '*Chlorocoma*' *cadmaria* is distinct genetically from *Chlorocoma* s. str. This species is the only *Chlorocoma* that feeds on *Leptospermum*;
5. '*Prasinocyma*' *semicrocea* is genetically and morphologically very close to *Chlorocoma*.
6. The Dysphanini, represented by *Dysphania numana*, forms a distinct sister group to the Geometrinae (LW Rhodopsin data only).

This study is not complete. More taxa are yet to be included in the molecular analysis and relationships will be further explored in the context of morphological structures.

Recent developments in our understanding of the southern Australian Larentiinae

Peter B. McQuillan & Catherine J. Young

McQuillan, P. B. & C. J. Young (2006): Recent developments in our understanding of the southern Australian Larentiinae. – Spixiana **29/3:** 205-206

Corresponding author: Dr. Peter B. McQuillan, School of Geography and Environmental Studies, University of Tasmania, Hobart; TAS 7000;
e-mail: P.B.McQuillan@utas.edu.au

There is renewed interest in the Larentiinae since their basal position in the family was inferred from molecular data (Abraham et al. 2001, Young 2004).

Southern Australia, defined as the Bassian biogeographical region, has a moderately diverse fauna of larentiines of perhaps 200 species. Several major tribes (e.g. Xanthorhoini, Eupitheciini, Trichopterygiini) are represented although Australian "Hydriomenini" need further study to clarify their tribal relationships (Schmidt 2001) and enigmatic taxa such as *Chaetolopha*, associated with ferns, currently defy tribal placement (Schmidt 2002).

Larentiine diversity in Australia is greatest in regions of higher rainfall. The Xanthorhoini are strongly concentrated in the moister parts of southern Australia and there is considerable local endemism at higher elevations. The genus *Chrysolarentia* is available for many of the Australian members of this tribe.

There are several genera shared with New Zealand, including *Austrocidaria* (Tasmania), *Epyaxa* and "*Anzarhoe*". The phenotypically variable and multivoltine *E. subidaria* is one the most familiar urban moths in southern Australia, thriving in lawns and gardens on *Plantago* and other weeds.

The Eupitheciini is poorly studied though relatively diverse with a number of undescribed species. Many are associated with the reproductive parts of plants as they are elsewhere in the world. Some are highly vagile, including *Phrissogonus laticostatus*, which is a member of a suite of (often) polyphagous moths which experience breeding peaks is wet years in the semi-arid parts of Australia and then disperse widely to coastal areas and off-shore islands. A few eupitheciines (e.g. *Chloroclystis approximata*) and xanthorhoines (e.g. *Epyaxa* spp.) have adapted to agricultural crops and orchards. Alpine adaptation is apparent in several lineages: *Aponotoreas*, *Melitulias*, "*Hydriomena*" and several xanthorhoine genera.

Foodplant associations remain poorly known. As elsewhere, most xanthorhoines are herb-feeders although *Austrocidaria* on *Coprosma* (as in New Zealand). *Tympanota* on *Podocarpus* is the only larentiine associated with Australian conifers (Dugdale 1980). Sclerophyllous understorey shrubs are important hosts of many "Hydriomenini": *Hibbertia* (Dilleniaceae) supports *Anachloris* (Schmidt 2001) and Fabaceae shrubs support several other taxa. Epacridaceae is eaten by some *Poecilasthena*. It is noteworthy that almost no larentiines feed on *Eucalyptus*, but the reasons for this are unclear. Although Schmidt (2005, 2006a,b) has subjected some tropical taxa to recent review, much remains to be done.

References

Abraham, D., N. Ryrholm, H. Wittzell, J. D. Holloway, M. J. Scoble, and C. Löfstedt 2001. Molecular phylogeny of the subfamilies in Geometridae (Geometroidea: Lepidoptera). – Mol. Phylog. Evol. 20: 65-77

Schmidt, O. 2001. The Australian species of *Anachloris* Meyrick (Lepidoptera: Geometridae: Larentiinae): taxonomy, male genitalia musculature and systematic position. – Austr. J. Ent. **40**: 219-230

-- 2002. A revision of the genus *Chaetolopha* Warren (Lepidoptera: Geometridae: Larentiinae) with a description of *Parachaetolopha*, gen. nov. – Invertebr. Sys. **16**: 703-733

-- 2003. Some results of taxonomic research on larentiine moths from the Australasian region. – Spixiana **26**: 204

-- 2005. Revision of *Scotocyma* Turner (Lepidoptera: Geometridae: Larentiinae). – Austr. J. Ent. **44**:, 257-278

-- 2006a. *Visiana sordidata* (Moore), a complex of species from the Indo-Pacific region (Insecta, Lepidoptera, Geometridae, Larentiinae). – Spixiana **29**: 77-85

-- Australasian genus *Scotocyma* Turner and the recently described species *S. sumatrensis* Schmidt (Lepidoptera, Geometridae, Larentiinae). – Heteroc. Sumatr. **12: 241-255**

Young, C. J. 2004. Characterisation of the Australian Nacophorini and a phylogeny for the Geometridae from molecular and morphological data. – PhD Thesis, University of Tasmania, Hobart

Filling in the gaps: South-Eastern Mountain Grassland as an important corridor and refuge for Montane Palaeogenic Elements within the southern African geometrid fauna (Lepidoptera, Geometridae)

Martin Krüger

Krüger, M. (2006): Filling in the gaps: South-Eastern Mountain Grassland as an important corridor and refuge for Montane Palaeogenic Elements within the southern African geometrid fauna (Lepidoptera, Geometridae). – Spixiana **29/3:** 206-207

Dr. Martin Krüger, Transvaal Museum, NFI, P.O. Box 413, Pretoria 0001, South Africa; e-mail: kruger@nfi.co.za

Revisionary work on various groups of moths, with a focus on Geometridae, since the late 1990's has provided substantial evidence for the existence of a Montane Palaeogenic Element as defined by Stuckenberg (1962) within the southern African geometrid fauna. However, although distribution patterns for several taxa are now well documented for the Western Cape, the Maloti Mountains of Lesotho and mountainous areas of the escarpment further north, virtually no data from suitable high-lying areas that may support this relictual fauna have been available for the vast area between the Western Cape and the foothills of the Malotis, representing a gap of more than 500 km.

A recent sample comprising 141 species of Geometridae collected in the Sneeuberge (approx. 32°10'S 24°55'E), situated in the western part of Eastern Cape Province, South Africa at altitudes between 993 and 1618 m, was analyzed for trends in composition according to altitude and/or vegetation type. (The highest peak in the area reaches 2122 m but areas above 1618 m could not be sampled due to difficulty of access.) Above 1600 m, the area is occupied by a southerly extension of South-Eastern Mountain Grassland (grassland biome), whereas the lower-lying areas fall into the semiarid Eastern Mixed Nama Karoo (Nama Karoo biome), a semiarid veld type ecotonal to grassland.

No trends were observed regarding altitudinal distribution at subfamily level, and representation of Geometrinae, Sterrhinae and Ennominae as a percentage of the species total for southern Africa was similar (9.94 to 12.96 %), although Larentiinae were more strongly represented (34 species or 21.94 % of the total for the subregion). When viewed in isolation, the fauna of South-Eastern Mountain Grassland is characterized by a marked reduction in Geometrinae and Sterrhinae, with a concomitant increase in Larentiinae. Within Ennominae, however, samples from Eastern Mixed Nama Karoo were dominated by Macariini, whereas the diversity of Ennomini, Gnophini and especially Nacophorini increased in South-Eastern Mountain Grassland. Nacophorini have only recently been recorded from southern Africa; the tribe remains unsatisfactorily defined but is probably basal within Ennominae and almost entirely limited in its distribution to the former Gondwanan continents Australia, South America and southern Africa.

As would be expected from its being contiguous to Alti-Mountain Grassland, one of the two dominant high-altitude veld types in Lesotho, in the eastern part of its range, the montane moth community dependent on South-Eastern Mountain Grassland is overall more similar to that of the Maloti range and adjacent montane areas than to that of the Western

Cape. However, a number of species are continuously distributed, suggesting that South-Eastern Mountain Grassland plays an important role as a corridor. Conversely, the comparative isolation of the Sneeuberge was sufficient to allow the development of at least nine local endemics.

The genus *Bracca* Hübner in the Oriental and Australian tropics: Distribution patterns and the phenomenon of strikingly different island-races (Geometridae, Ennominae)

Dieter Stüning

Stüning, D. (2006): The genus *Bracca* Hübner in the Oriental and Australian tropics: Distribution patterns and the phenomenon of strikingly different island-races (Geometridae, Ennominae). – Spixiana **29/3:** 207-208

Dr. Dieter Stüning, Zoologisches Forschungsmuseum Alexander Koenig, Adenauerallee 150-164, D-53310 Bonn, Germany;
e-mail: d.stuening.zfmk@uni-bonn.de

Species in the genus *Bracca* Hübner [1820] are distributed in the Oriental and Australian tropics; the geographic range extends from the extreme south of Thailand to tropical Australia. 26 species are recorded for the genus (Parsons et al., 1999), the majority (14 species) inhabit New Guinea and the surrounding islands, 4 species are found in Northern Australia (2 endemic). A further species has been described from Sulawesi recently (Stüning, 2005), but several undescribed species are still known to occurs (Sulawesi, Luzon, Mindanao). A striking feature of the species now included in Bracca is the diversity of wing pattern. Until Holloway (1991) united them in the present genus, they have been scattered over at least fifteen genera. Five of them, *Arycanda* Walker, 1856, *Cosmethis* Hübner [1820], *Duga* Walker [1865], *Panaethia* Guenée [1858] and *Tigridoptera* Herrich-Schäffer, 1855, Holloway (l.c.) proved to be junior subjective synonyms of *Bracca*, the other names were just applied erroneously to certain species, belonging even to different families like Arctiidae and Noctuidae.

Besides the variety of wing pattern on species level, some widespread species show a similar feature on subspecies level: this phenomenon of largely different island races has been found so explicit only in the genus *Bracca*. Four examples are discussed in detail:

B. maculosa Warren: the nominate subspecies, occurring in Sumatra, Borneo and Peninsular Malaysia has black pattern elements on a blue-grey ground colour, its subspecies *radiolata* Warren from Palawan has several dull orange, longitudinal streaks in addition and the black pattern elements are of different shape and arrangement (Fig. 1).

B. exul Herrich-Schäffer: the nominate subspecies, distributed in Java, also has black pattern elements on a blue-grey ground, several dull orange, longitudinal streaks and a broad distal area without any markings on both wings. Its subspecies *actinoides*

a b

Fig. 1. *Bracca maculosa maculosa* Warren (**a**) and its subspecies *B. m. radiolata* Warren (**b**).

Sommerer & Stüning from Sumatra has this area extensively marked with longitudinal, black stripes and the number of dull orange stripes is reduced.

B. monochrias Meyrick, described from Sangihe Island, and its subspecies *cuneiplena* Swinhoe (Mindanao) and *benguetana* Schultze (Luzon) exhibit comparatively strong differences.

B. georgiata Guenée, with the nominate subspecies, found in Sumatra, Borneo, Peninsular Malaysia and Sulawesi, similar in pattern and coloration to *B. maculosa*, its race *pervasata* Walker from Java also with additional, dull orange streaks. The name *pervasata* is applied to several more or less different island races (Buru, Seram, several Philippine islands) at present which may deserve subspecies-rank as well. In Sulawesi, the nominate *georgiata* seems to occur sympatrically with its race *pervasata*, but studies of the genitalia structures have revealed that the *pervasata*-like form is specifically different. This phenomenon may be explained by subsequent arrival (of *georgiata*) after initial vicariance, as observed also in other groups of moths and butterflies.

The conspicuous pattern of adult *Bracca* moths and their larvae – the latter are strikingly coloured with red, black and white elements – may indicate that they are distasteful or toxic for predators. Consequently, mimicry phenomena are a possible explanation for the development of those strongly different island races, encountered in the genus *Bracca* so explicitely.

Diversity and Phenology of Geometridae in coastal Central Queensland

Peter Mackey

Mackey, P. (2006): Diversity and Phenology of Geometridae in coastal Central Queensland. – Spixiana **29/3:** 208-209

Peter Mackey, P.O. Box 404, Yandina, Q. 4561, Australia;
e-mail: pmackey@bigpond.net.au

Light trapping was carried out on 5 nights per week over 7 years at Rockhampton in Central Queensland, circa 40 km inland. Rockhampton lies close to the Tropic of Capricorn in an arid corridor between wetter regions, north to Mackay, and south-east Queensland. The December mean maximum temperature is 31.4 °C and the mean minimum for July is 22.9 °C. The mean number of rain days per year is 92. Good rain events are often associated with cyclones during the wet (hot or summer) season.

Most collecting was carried out during low to average rainfall periods, with 1983 having the highest rainfall and 1982 the lowest. The trap was a Robinson style trap located in the University grounds and was surrounded by Eucalyptus 'scrub' which is regrowth, possibly 40 years old at the time of trapping. The daily catch was identified and recorded using 'Rothampstead Weeks'. Seasons were allocated as follows: Summer, weeks 49-9; Autumn, weeks 9-21; Winter, weeks 22-34; Spring, weeks 35-48.

Trapping yielded 13,324 individuals and 123 species of Geometridae. Between 53 and 84 species were recorded each year. Ennominae accounted for 38 species; Sterrhinae, 23 species; Geometrinae, 35 species; Larentiinae, 10 species; Oenochrominae 17 species. Of the 10 most abundant species 2 were Ennominae, 4 Oenochrominae, 1 Geometrinae and 3 Sterrhinae. A species accumulation curve calculated using EstimateS (Colwell 2005) predicted a total fauna 136 geometrid species. There is a relationship between annual rainfall and the number of geometrid species present each year. However, using Ecosim (Gotelli and Entsminger 2001) to standardise the annual community to 1000 individuals shows there to be few significant differences between years. In wet years more species were collected because many species become more abundant and are therefore more likely to be collected.

Phenology of the species was assessed by pooling the annual counts on a weekly basis and some illustrative examples are presented. *Arhodia lasiocamparia* (Oenochrominae) is present throughout the year. *Oenochroma pallida* (Oenochrominae) is another relatively common species with probably 3 discreet generations in summer, autumn and spring but which is not present in winter (the dry season). *Cleora decisaria* (Ennominae) is present all year, but with ~85 % of occurrences in autumn and spring. *C. acaciaria* (*?illustraria*) also appears to be an autumn and spring species. *Pachyplocia griseata* (Ennominae) appears to be a summer, autumn, winter species. *Psilalcis isombra* (Ennominae) occurs predominantly in winter and spring. *Scopula innocens* (Sterrhinae) is a spring-summer-autumn species. *S. rubraria* is an autumn-winter-spring species with only 1 occurrence in 7 years in late summer. This species was first found in 1985 and then in subsequent years in increasing abundance as was the spring time species *Zermizinga sinuata* (Ennominae). *Mixocera latilineata*

(Geometrinae) is found in late spring but is predominantly a summer and autumn species. *Prasinocyma rhodocosma* (Geometrinae) is a common species which can be found throughout the year, but given its abundance, it has very few occurrences (7 %) in spring. There also seems to be some indication of several distinct generations throughout the year.

References

Colwell, R. K. 2005. EstimateS: Statistical estimation of species richness and shared species from samples. Version 7.5. User's Guide and application at: http://purl.oclc.org/estimates.

Gotelli, N. J. & G. L. Entsminger 2001. EcoSim: Null models software for ecology. Version 7.0. Acquired Intelligence Inc. & Kesey-Bear. http://homepages.together.net/~gentsmin/ecosim.htm.

Towards a global online information system Geometridae (GlobInG)

Axel Hausmann & Sven Erlacher

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Corresponding author: Dr. Axel Hausmann, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany;
e-mail: Axel.Hausmann@zsm.mwn.de

Supported by the GBIF programme of the German Federal Ministry of Education and Research, umbrella project ID: 01 LI 02043, Oct. 2002 – Dec. 2005, lead: Dr. Ch. Häuser, Stuttgart

The GlobInG project aims to improve access to

- collections by providing digital photographs of the ca. 5000 primary type specimens of Geometridae stored in German museums and by inventorying accompanying scientific data (examined primary data)
- relevant literature data with scientific control of taxonomic status and nomenclatural availability; as far as possible with digital facsimile of original description

Until today 1500 primary types are photo-documentarily recorded, including more than 4000 picture data of dorsal and ventral view of the specimens and the labels. To date, about 800 object data sets (including all primary types of the Herbulot collection at the ZSM) are processed in detail and are integrated into the existing database according to the standards of the GART/GloBIS project on the butterflies of the world. For this the respective original descriptions were evaluated and all relevant taxonomic information was included into the database. These data sets contain the citation of the original description, information about the locus typicus, a listing of the type material, and, additionally, the digital photographs of each specimen mentioned above. So far the database contains 2000 image data sets of these completely processed primary types, 300 accompanying literature data sets, 400 image data sets of the facsimile of the original descriptions and 150 images of genitalia slides. The data are accessible through the internet-based SYSTAX database system at Ulm University (SYSTAX; GBIF-D). Sustainability is guaranteed by continuous maintenance through ZSM. Similarly, Geometridae types from other collections in Germany and other countries have been inventoried within the framework of the FORUM HERBULOT initiative, thus great international impact is expected from both of these activities, and Geometridae as model group will get established further for various kinds of research.

At the Forum Herbulot 2006, two strategies are proposed for the future and disposed to discussion, in order to integrate other existing data sets worldwide into the 'Global Information System Geometridae' ('GlobInG-Input-Light' and 'GlobInG-Input-Full').

SYSTAX:
http://www.biologie.uni-ulm.de/systax/daten/index_e.html

SYSTAX: Geometridae (List of Taxa):
http://www.biologie.uni-ulm.de/cgi-bin/portal/portal.pl?tquery=geometridae&cquery=&locquery=&longfrom=&longto=&latfrom=&latto=&labquery=&iquery=&query=&wrapper=0&data=all&typus=yes&sort=tax&displ=s&lang=e&sid=T&expert=yes&acro=ZSM

GBIF-D:
http://www.biologie.uni-ulm.de/cgi-bin/query_all/query_all.pl?lang=d&pr=gbif-e1

GBIF-D: Geometridae:
http://www.biologie.uni-ulm.de/cgi-bin/system/zoosys.pl?pr=gbif-e1&id=1029&stufe=5&typ=ZOO&sid=T&only=no&syno=n&valid=n&lang=d

FORUM HERBULOT:
http://www.herbulot.de

The Lepiafrica Living Books Project

Hermann S. Staude, Andre Coetzer, Bennie Coetzer, Douglas M. Kroon, John Joannou & Martin Krüger

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Corresponding author: Hermann S. Staude, P. O. Box 398, Magaliesburg, Gauteng 1791, South Africa.; e-mail: hermann@busmark.co.za

Objective: The objective of this project is to accumulate and to ultimately offer known baseline information and images of as many as possible Afrotropical Lepidoptera in an easy to use structured electronic format to interested parties.

The project team: Members of the project team consist of editors and compilers. Each compiler carries the responsibility of a taxonomically defined part of the project, while editors have specific functions covering the whole project.

Contributors: Contributors are individuals and/or institutions who contribute information or images to the project. There are two categories of contributors. Primary contributors contribute bulk information or images. Secondary contributors contribute bits of information or images on an ad hoc basis. Contributors grant permission to the project to use their data but ownership of data remains with the contributor.

Distribution medium: The LepiAfrica Living Books Project is structured to work in conjunction with the Lepidops© database program already in use by members of The Lepidopterists' Society of Africa. Lepidops© is economical, effective and easy to use.

Duration of the project & publication units: The project team is aware that it is unlikely that the above objective will be met within the foreseeable future and therefore treats this as an ongoing project. Copies of various sections of the project are offered separately and are made available from time to time, when the project team considers a section to be ready for release. Updates will thereafter be made available periodically.

Structure & funding: The LepiAfrica Living Books Project is a Section 21 Company not for gain. The project is currently privately funded by its members. Income derived from the sale of LepiAfrica units will go towards funding the project in the future.

Molecular barcoding and larval gut content analysis in insects (Geometridae, Lepidoptera)

Axel Hausmann, Michael A. Miller & Günter C. Müller

Hausmann, A., M. A. Miller & G. C. Müller (2006): Molecular barcoding and larval gut content analysis in insects (Geometridae, Lepidoptera). – Spixiana **29/3:** 210-211

Corresponding author: Dr. Axel Hausmann, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany;
e-mail: Axel.Hausmann@zsm.mwn.de

On the background of the enormous species numbers in insects, the innovative technique of molecular barcoding will more and more play a major role in entomological research by facilitating identification of all stages, and thus for assessment of biodiversity. It may, however, also gain a certain importance for ecosystem research, and systematics.

In the year of 2005 the ZSM has got offered access to several thousands of neotropical Geometridae larvae collected in 1800 fogging samples of Terry

Erwin (Lucky et al. 2002; Erwin et al. 2006), who monitored the fauna of 200 trees in 9 replicates from 1994-1996 in north-eastern Ecuador. Identity of all the fogged trees, and their neighbours is known. In two pilot studies we could prove, that larvae can be identified to species by their 'barcode sequences' (mtDNA), and that sequencing of gut content is possible too, in order identify the larval plant meal and to prove feeding on the fogged host-tree, rather than on epiphytes or on the neighbouring tree (Miller et al. 2006; Matheson et al. 2006). Identification of the larvae was performed by analysis of the complete sequence of the mitochondrial gene cytochrome c oxidase I (COI) and comparison with sequences of collection specimens. The effectiveness of the 'barcoding' tool for species identification had already been shown in many other studies (cf e.g. Hebert & Mitchell 2006). Gut contents were successfully identified by comparing sequence of a 157 bp long fragment of the chloroplast gene *rbcL* with that of of the pre-identified host-plant and a wide set of other plants of the study area. Plant meals could be detected, when the insects were killed and preserved in Ethanol up to 12 hours after the last feeding (Matheson et al. submitted). For large sets of possible host-plants and for discrimination of closely related plant species, e.g. in tropical countries, additional markers (fragments/genes) may be necessary.

Results from the planned research project will provide, for the first time, comprehensive information on host-plant relationships and host specifity for a large group of phytophagous insects in the neotropical rain forest canopy. With these data the estimations of total species numbers in Geometridae and insects may be extrapolated and refined. Similar projects are planned for geometrid moth larvae in Israel.

References

Erwin, T. L., M. C. Pimienta, O. E. Murillo & V. Aschero 2006. Mapping Patterns of β-Diversity for Beetles Across the Western Amazon Basin: A Preliminary Case for Improving Inventory Methods and Conservation Strategies

Hebert, P. & A. Mitchell 2006. DNA barcoding of Australian Lepidoptera. – Spixiana **29** (3): 211-212

Lucky, A., T. L. Erwin & J. D. Witman 2002. Temporal and spatial diversity and distribution of arboreal Carabidae (Coleoptera) in a western Amazonian rain forest. – Biotropica **34** (3): 376-386

Matheson, C. D., G. Müller, K. Vernon, A. Junnila, A. Hausmann, M. A. Miller, C. Greenblatt & Y. Schlein (submitted). Species identification of plant residues found in the gut of insects by a PCR method. – ODE (submitted)

Miller, M. A., G. C. Müller, V. D. Kravchenko, A. Junnila, K. K. Vernon, C. D. Matheson & A. Hausmann (in print). DNA-based identification of Lepidoptera larvae and plant meals from their gut content. – Russ. Ent. J.

DNA barcoding of Australian Lepidoptera

Paul Hebert & Andrew Mitchell

Hebert, P. & A. Mitchell (2006): DNA barcoding of Australian Lepidoptera. – Spixiana **29/3:** 211-212

Corresponding author: Dr. Andrew Mitchell, Agricultural Scientific Collections Unit, Orange Agricultural Institute, NSW Department of Primary Industries, Forest Rd, Orange NSW 2800, Australia; e-mail: andrew.mitchell@dpi.nsw.gov.au

DNA barcodes are short (658 bp) sequences from a standardized region of the mitochondrial gene cytochrome c oxidase I (COI or cox1). Past work has revealed that sequence diversity in this gene region is an effective tool for species identification and discovery. As a result, large-scale DNA barcoding programs are now underway, including efforts to assemble barcodes for all fish and all bird species. We intend to develop a comprehensive barcode library for Australian lepidopterans as a complement to a similar project underway in North America.

We now present results of a pilot study that has barcoded 3500 specimens representing over 800 species collected from sites in north-eastern Queensland and the Central West of New South Wales. All specimens were databased and photographed before DNA was extracted from a single leg. DNA barcodes were subsequently gathered from the specimens and analysed using the Barcode of Life Data System (www.barcodinglife.org) .

Levels of intra-specific variation at COI averaged just 0.2 %, while congeneric species showed sequence divergences that were, on average, 20 times higher. As with studies in other geographic regions, more than 95 % of the species that we examined possessed unique DNA barcodes, allowing their easy identification. Although there was little overlap in species coverage between our two sampling regions, our results suggest that geographic variation in barcode sequences will not be an important complication in species recognition.

We expect to obtain barcode coverage for all common species of Australian Lepidoptera through intensive collecting at a few well-chosen sites. However, we also hope to broaden our network of collaborators so that more extensive sampling coverage is possible. As well, we expect that advances in sequencing technology will soon permit the analysis of museum collections, allowing rapid growth in sequence coverage for uncommon taxa.

Successful extraction of eggs from dry geometrid moth collection specimens

Axel Hausmann, Sławomir Kuczkowski & Marius Junker

Hausmann, A., S. Kuczkowski & M. Junker (2006): Successful extraction of eggs from dry geometrid moth collection specimens. – Spixiana **29/3:** 212

Corresponding author: Dr. Axel Hausmann, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany;
e-mail: Axel.Hausmann@zsm.mwn.de

Though modern techniques (scanning electron microscopy, SEM) offer very promising perspectives for the study of egg morphology, this kind of research has not achieved much attention in geometrid moth systematics, apart from a few publications (cf. Salkeld 1983; Young 2006).

SEM studies of egg morphology are generally thought to require fresh material. Very often, however, living females are unavailable due to rareness or restricted distribution areas in tropical countries, they may be hardly stimulated to egg deposition or their life cycles may not coincide with the study period.

In this contribution we present a way to get access to suitable egg material from dry female collection specimens. The method is based on enzymatic digestion of the abdomens and it is the same, which was recently proposed (Knölke et al. 2005) as a combined procedure for obtaining both DNA for sequence analysis and mazerated tissues for the preparation of the genitalia. Hence, this the new method can provide, simultaneously, three completely different data sets for taxonomic and phylogenetic research.

We analysed the influence of various parameters on the quality of the results, e.g. protease concentration, duration of digestion, humidity, and age of voucher (collection date).

In most cases the results are highly satisfying and provide clear SEM photographs of the chorionic sculpturing, which are very similar to those from fresh egg material of the same species. We got good results also from old collection specimens (up to >100 years). A number of examples was shown in the presentation, detailed results are published in Junker et al. (2006). The method is applied in a research program on Sterrhinae phylogeny, which was shortly presented, too.

References

Junker, M., S. Kuczkowski, K. Schönitzer, C. Young & A. Hausmann (in press). Enzymatic digestion – a new method for egg extraction from dry female collection specimens (Lepidoptera: Geometridae). – Insect Syst. Evol. **37**

Knölke, S., S. Erlacher, A. Hausmann, M. A. Miller & A. H. Segerer 2005. A procedure for combined genitalia dissection and DNA extraction in Lepidoptera. – Insect Syst. Evol. **35** (4): 401-409

Salkeld, E. H. 1983. A catalogue of the eggs of some Canadian Geometridae (Lepidoptera), with comments. – Mem. Ent. Soc. Canada, Nr. **126**, Ottawa, 271 pp.

Young, C. J. 2006. Descriptions of eggs of some southern Australian Geometridae (Lepidoptera). – Zootaxa 1287

The Australasian genus *Scotocyma* Turner (Lepidoptera, Geometridae, Larentiinae)

Olga Schmidt

Schmidt, O. (2006): The Australasian genus *Scotocyma* Turner (Lepidoptera, Geometridae, Larentiinae). – Spixiana **29/3:** 213

Olga Schmidt, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany; e-mail: Olga.Schmidt@zsm.mwn.de

Larentiinae occur worldwide, are diverse and usually mesophilous, preferring temperate abiotic conditions. The Australasian genus *Scotocyma* is rather atypical for the subfamily because it occurs mainly in the tropics and subtropics. The genus comprises 11 species: *S. albinotata* (Walker), *S. legalis* (Warren), *S. mimula* (Warren), *S. miscix* Prout, *S. manusensis* Prout, *S. scotopepla* Prout, *S. asiatica* Holloway and the recently described species *S. samoensis* Schmidt, *S. rutilimixta* Schmidt, *S. sumatrensis* Schmidt, and *S. longiuncus* Schmidt. The main results of the revision of the genus *Scotocyma* are as follows: (1) keys to species and distribution maps are provided; (2) a phylogenetic analysis is performed to test the monophyly of the genus; (3) the distribution patterns of the species are examined; (4) a biogeographic discussion is included; (5) the tribal position of the genus is clarified and the relationships to closely related genera are discussed.

The following characters are diagnostic for the genus *Scotocyma*. Labial palpus is thick, short, curved, with the terminal segment small, blunt. Antenna is simple in both sexes. The seventh abdominal segment in males bears coremata, consisting of eversible hair tufts in a long, broad pocket bearing a narrow, finger-shaped appendix. A thin, weakly sclerotised ring between the seventh and the eighth segments is present, with a small medial sclerite attached. The ansa of a tympanal organ has a small, simple scoloparium. In the male genitalia uncus is sclerotised, with its base modified; tegumen is usually with short, sclerotised, sometimes serrated, arms; valva is narrowed medially, comb-like structures set on the valval sacculi; vinculum has no distinct saccus; calcar is present, with broad hood-shaped membrane connected to its basis; aedeagus is thick, short, with its coecum oblique-rounded. In the female genitalia antrum is large, sclerotised, somewhat funnel-shaped, longitudinally folded; ductus bursae is shortened, membranous; corpus bursae has patches of sclerotisation on its dorsal side, with a large diverticulum; signum is large, usually a patch of inwardly directed spicules on ventral side.

The new phylogenetic analysis confirmed the monophyly of the genus *Scotocyma*. According to the analysis, the species *(S. albinotata + S. legalis) + S. samoensis* are grouped in one clade. The defining characters are: teeth on lateral tegminal arms strongly developed; folds in antrum rather broad, two or three on each side. The second clade comprises the species *S. asiatica + S. sumatrensis*. The characters defining the second clade are: brownish median band in the forewing underneath with medial projection outwards narrowly rounded; medial spot at the termen in forewing underneath large, higher than wide, marginally speckled with darker scales. The third clade is not resolved and comprises the species *S. rutilimixta + S. scotopepla + S. longiuncus*. The defining character is: teeth on lateral tegminal arms in males moderately developed. The sister-clade is *(S. manusensis + S. mimula)*. The defining characters are: medial spot at the termen in the forewing underneath medium-sized, square, with distinct edges, signum in the corpus bursae of females shifted to the side.

The Indo-Australian genus *Visiana* Swinhoe and the identity of the supraspecific taxa of *V. sordidata* (Lepidoptera, Geometridae, Larentiinae)

Olga Schmidt

Schmidt, O. (2006): The Indo-Australian genus *Visiana* Swinhoe and the identity of the supraspecific taxa of *V. sordidata* (Lepidoptera, Geometridae, Larentiinae). – Spixiana **29/3:** 214

Olga Schmidt, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany; e-mail: Olga.Schmidt@zsm.mwn.de

The genus *Visiana* Swinhoe belongs to the geometrid moth subfamily Larentiinae which occurs worldwide. The genus contains medium- to relatively large-sized moths of which the dark-brownish colouration resembles that of several other genera (e.g. *Disclisioprocta* Wallengren from South Africa, Madeira (Portugal) and South America, *"Horisme"* from Papua New Guinea, and *Scotocyma* Turner from the Australasian region). *Visiana* is widely distributed within the Indo-Australian region, from north-eastern Himalaya through the Indonesia and Malaysia to Papua New Guinea and eastern Australia.

According to the present knowledge, the genus *Visiana* currently comprises the following species: *V. brujata* (Guenée) from eastern Australia, *V. excentrata* (Guenée) from the south-east of Australia, *V. hyperctenista* (Prout) from Bismarck Archipelago, *V. sordidata* (Moore) from the Indo-Australian region, and *V. vinosa* (Warren) from Papua New Guinea. *Visiana sordidata* comprises the following subspecies: *V. s. inimica* (Prout), *V. s. robinsoni* (Prout), *V. s. tamborica* (Prout) (Scoble, 1999). The species of the genus are difficult to tell apart using the characters of the wing colouration and pattern. The information about genitalic characters which would help distinguishing the species was still mostly lacking. Examination of phylogenetic relationships of *Visiana* and related larentiine genera suggested *Visiana* was not monophyletic.

The current studies of the external characters and the genitalia revealed that all supraspecific taxa within the species *V. sordidata* should be regarded as distinct species, *V. robinsoni*, *V. inimica*, and *V. tamborica*. The main distinguishing characters are: the shape and length of the uncus, saccus, lateral papillae of juxta, and the aedeagus in the male genitalia and the shape of the ductus and corpus bursae, and of signum in the female genitalia. Furthermore, the specimens from Borneo (Malaysia) are to be assigned to a new species, *V. hollowayi*.
The species of the genus *Visiana* occur in the forest zone. All known specimens were attracted to light at night. All attempts to collect the Australian *Visiana* s.str. species during the day time failed which suggests that the species of the genus are nocturnal.

The present study also revealed that *Visiana* species feed on species of the plant genus *Urtica* (Urticaceae) that is very common around the globe in the Holarctic region and occurs in the Indo-Australian region and in South Africa. This is the first record of feeding on the species of the plant family Urticaceae for the Australian larentiine moths. The biology and larvae of the *Visiana* species are awaiting description.

References

Scoble, M. J. 1999. Geometrid Moths of the World: A Catalogue (Lepidoptera, Geometridae). – CSIRO Publishing, Collingwood, Victoria

A morphological approach to the Ennominae phylogeny (Lepidoptera, Geometridae)

Eugene A. Beljaev

Beljaev, E. A. (2006): A morphological approach to the Ennominae phylogeny (Lepidoptera, Geometridae). – Spixiana **29/3:** 215-216

Eugene A. Beljaev, Institute of Biology and Soil Science, Vladivostok, Russia; e-mail: beljaev@ibss.dvo.ru

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The Ennominae is the largest and, morphologically, most diversified subfamily in the Geometridae and the tribal composition and phylogeny of the subfamily are still far from being resolved. However modern molecular-phylogenetic investigations of the subfamily promise substantial breakthroughs in the construction of a meaningful phylogeny of the Ennominae (as well as of the Geometridae and other organisms). Nevertheless, in spite of the present predominant position of molecular-phylogenetic research in modern systematics, morphological analysis of organisms continues to be indispensable for the comprehension of taxonomy and evolution. Also, morphological analysis is irreplaceable for the definition of monophyletic groups, and even for the representational selection of specimens (samples) for molecular-phylogenetic analysis. A modern morphological tribal system and phylogeny for the Ennominae were proposed independently by Holloway (1994, 1997) and by Beljaev (1994). Here I propose a new hypothesis on basal branching in the Geometridae and Ennominae and tribal composition of the subfamily arising from the cladogram illustrated in Fig. 1.

In this analysis I applied direct weighting of characters based on comparative and functional-morphological analyses using outgroup comparison for the polarization of morphoclines. Structures of the anellar area of the male genitalia are mainly utilised in this investigation because they demon-

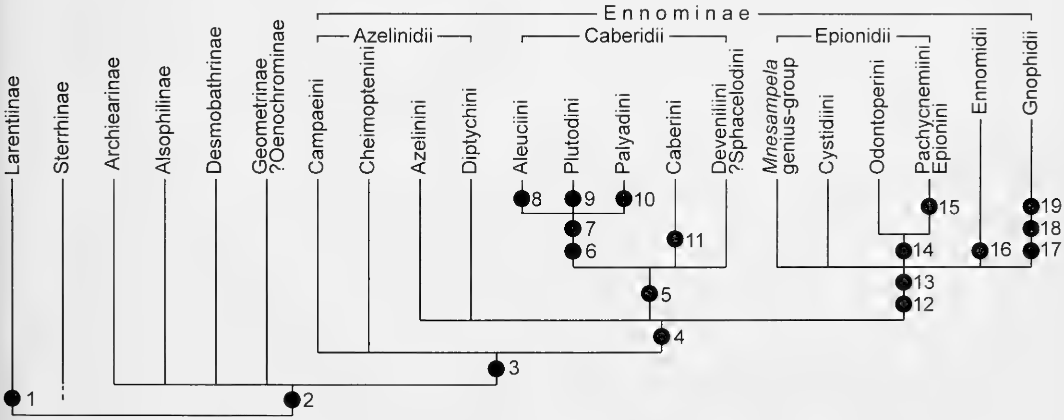

Fig. 1. Phylogenetic cladogram of basally derived branches in the Geometridae and Ennominae based on selected apomorpies. Apomorphies: **1,** labides which trend to medial shifting dorsad of aedeagus; **2,** labides removed from the bases of the valvae ventro-medially and which have approximately sagittal orientation of their bases; **3,** vein M_2 on hindwing lacking; **4,** signum deeply invaginated, toothed, sclerotized, hollow (mushroom-like); **5,** labides with bases orientated in frontal plane; **6,** cristae strongly developed; **7,** juxta broad, laterally almost reach base of transtilla; **8,** cristae integrated into juxta; **9,** sacculi with pointed and curved distal process; **10,** socii enlarged; **11,** sacculi articulated to each other directly, often connected to each other with traverse sclerotized bar; juxta placed posterior of sacculi; **12,** transtilla shaped as flat sclerite smoothly proceeds into costa of valva and possessing ventral process; **13,** muscle m_4 attached to transtilla mediad of *m2*, *m2* and *m4* crossed; **14,** labides flattening, horn-like, intromitted into ductus bursae at the copulation; **15,** labides with dorsal end of basis far from base of transtilla; **16,** labides shaped as narrow sclerotized 'bridges' between juxta and base of transtilla; **17,** labides absent; **18,** waist between tegument and vinculum absent; **19,** muscle *m4* arising from tegumen.

strate high diversity in combination with nonrandom distribution of types in taxa. Among them, labides had been explored as the most phylogenetically informative anellar structure in Geometridae (i.e. applicable for the supporting of many basal nodes in the family). My understanding of the term 'labides' needs to be commented. Because of their high morphological diversity these structures have been named differently in literature (here, only the author is mentioned, who introduced the term, in the historical order): F. Pierce: labides, anellus lobes, furca (part); Th. Albers: Führungsarme; F. Rindge: lateral fold, postero-lateral structures, processes of the anellus, postero-lateral pair of sclerotized areas in manica, lateral ridges; R. Orfila & S. Schajovskoy: canaliculi (incorrect treatment of Pierce's term); J. Holloway: arms of juxta, haired processes from base of valva; W. McGuffin: lobes of juxta; J. Viidalepp: dorsal processes/appendages of juxta; P. McQuillan: lateral/dorsal processes of juxta; A. Hausmann: posterior processes of juxta; L. Pitkin: anellar sclerites. Based on the classic criteria of homology I consider all these structures as homologous and propose the term 'labides' (Pierce 1914) as the senior and most convenient name for them.

The transtilla also provides important apomorphies for basal branching in the Ennominae, but the phylogenetic significance of the transtilla characters can only be realised relative to the attached muscles: dorsal abductor and adductor valvae (*m2* and *m4*, following Kuznetzov & Stekolnikov).

A tentative tribal system of the Ennominae corresponding to the proposed phylogenetic cladogram is represented on the Forum Herbulot website (http://www.zsm.mwn.de/external/herbulot/famgroup2.htm; http://www.herbulot.de).

References

Beljaev, E. A. 1994. [Geometers of the subfamily Ennominae (Lepidoptera, Geometridae) of the Far East of Russia. Abstract of the candidate of biological sciences thesis.] 23 pp. – Zool. Inst. Russ. Acad. Sci. St.-Petersburg (In Russian.)

Holloway, J. D. 1994. The Moths of Borneo: family Geometridae, subfamily Ennominae. – Malayan Nat. J. **47**: 1-309. (The Moths of Borneo **11**.)

–– 1997. The Moths of Borneo: family Geometridae, subfamilies Sterrhinae and Larentiinae. – Malayan Nat. J. **51**: 1-242. (The Moths of Borneo **10**.)

Kuznetsov, V. I. & A. A. Stekolnikov 2001. New approaches to the system of Lepidoptera of world fauna (on the base of functional morphology of the abdomen). – St. Petersburg: "Nauka": 462 p. (Proc. Zool. Inst. **282**) (In Russian, with English summary.)

Pierce, F. N. 1914. The genitalia of the group Geometridae of the Lepidoptera of the British Islands. – pp. i-xxix+1-88, pls I-XLVIII. Liverpool, the author

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New records of Caudofoveata (*Falcidens gutturosus, Prochaetoderma raduliferum*) and of Solenogastres (*Eleutheromenia carinata*, spec. nov.) from the eastern Mediterranean Sea

(Mollusca)

Luitfried v. Salvini-Plawen & Bilal Öztürk

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Samplings off the shores of Turkey and northern Cyprus between 1997 and 2004 were obtained from sandy and muddy bottoms down to 680 m. Among the Mollusca some stations contained the aplacophoran Caudofoveata *Falcidens gutturosus* (Kow.) and *Prochaetoderma raduliferum* (Kow.); they contribute to our knowledge on the distribution of the species. A single sample included a member of the aplacophoran Solenogastres, *Eleutheromenia carinata* spec. nov.; this species is described and systematically compared.

L. Salvini-Plawen (corresponding author), Zentrum für Zoologie, Universität Wien, A-1090 Wien (Vienna/Austria), Althanstraße 14;
e-mail: Luitfried.Salvini-Plawen@univie.ac.at

B. Öztürk, Ege University, Faculty of Fisheries, Dept. of Hydrobiology, TK-35100 Bornova/Izmir (Turkey)

Introduction

Within the Mollusca, the Solenogastres (neomeniomorphs) and the Caudofoveata (chaetodermomorphs) represent two aplacophoran clades, both externally marked by a mantle with chitinous cuticle as well as unicellularly produced aragonitic sclerites and reflecting the conservative level of molluscan configuration (Salvini-Plawen 1985, 1988, 2003a, Salvini-Plawen & Steiner 1996, Haszprunar 2000). Though they long remained on the scientific sidelines, more intensive research during the last 35 years, however, has distinctly enlarged our knowledge on their organisation and evolutionary significance (summarised in Salvini-Plawen 1971, 1985, Scheltema et al. 1994). At present, the Caudofoveata (between 1.5 mm and 140 mm in length) include about 120 named species, which generally live in depths below 50 m (records range between 3 m and 9000 m depth; Scheltema 1995, Belyaev 1966). The Solenogastres include about 250 nominal species (between 0.8 mm and 300 mm in length) with records between 1 m and 6850 m depth (predominantly below 50 m; Salvini-Plawen 2003b, Belyaev 1966).

Despite such increase in knowledge during recent decades, the presently known range of both the Caudofoveata and the Solenogastres by no means includes the true biodiversity; it is still fairly fragmentary not only with respect to biological, developmental and physiological features, but even regarding pure faunistics (diversity, biogeography, etc.). Worldwide, extensive geographical areas remain to be investigated, and stock-takings even within more intensively investigated regions reveal that the true biodiversity is underestimated (e.g. Handl & Salvini-Plawen 2001, 2003, Salvini-Plawen 2003b). In the Eastern Mediterranen Sea only few samplings have also focused on aplacophoran molluscs; this is reflected in a poor knowledge of species biogeography and biodiversity (see Salvini-Plawen 1986). This contribution presents the records of Caudofoveata and of Solenogastres collected during research off the coast of Turkey and northern Cyprus. The examination and identification increased the known geographic distribution for two species of Caudofoveata and revealed a new species of Solenogastres.

Materials and methods

Samplings were made during various research projects between 1997 and 2004 on board the R/V "K. Piri Reis", R/V "Egesuf" and R/V "Hippocampus", along the Aegean Sea and Mediterranean Sea coasts of Turkey and of northern Cyprus. Specimens were obtained from sandy and muddy bottoms by grab, dredge and beam trawl at depths down to 680 m, and also from rocky biotopes and brown algae, red algae and *Posidonia oceanica* (L.) Delile, 1813 facies. The shallow shore samples were taken either by diving or by wading. The collected material was washed through a sieve with 0.5 mm mesh size and fixed in 4 % formalin. Specimens were sorted under a stereomicroscope in the laboratory. During the sorting process within the framework of a project supported by TUBITAK (The Scientific and Technical Research Council of Turkey, project code 103T154) representatives of the Caudofoveata and the Solenogastres were observed at some sampling stations (Fig. 1). These specimens were sampled from muddy substrates of various localities and depths (Tab. 1). The materials collected are deposited in the ESFM museum (Ege University, Turkey).

1. Caudofoveata

The samples (Fig. 1 and Tab. 1) included 16 ex. of Caudofoveata whose shape is characterised by a slender, tail-like posterior body with a terminal knob or tassel. They belong, however, to two species of different families.

Prochaetodermatidae Salvini-Plawen, 1968

Caudofoveata with biserial radula, each pair supplemented by a basal reinforcement and lateral elements of the radula membrane.

Genus *Prochaetoderma* THIELE, 1902

Pedal shield divided/paired, pharynx with a pair of large spatulate elements; median denticulate portion of the radula teeth membranously enlarged; posterior body tapering, tail-like.

Prochaetoderma raduliferum (Kowalewsky, 1901)

Material: St. 7, 1 ex., Sandy mud with shell fragments, 69 m.

Remarks. Recent investigations (Scheltema & Ivanov 2000) show that Mediterranean representatives of *Prochaetoderma*, all measuring below 5 mm in length, belong to four different species: *P. raduliferum* (Kow.), *P. alleni* (Scheltema & Ivanov), *P. boucheti* Scheltema & Ivanov, and *P. iberogallicum* S.-Plawen. These are

Tab. 1. Coordinates, depths, dates and biotope characterisations of the samples.

Sta.	Date	Coordinates	Substrate	Depth (m)	Species
1	29.04.1997 25.04.1998	38°41'N–26°32'E	Mud	75	1 *Eleutheromenia* n. sp. 1 *F. gutturosus*
2	02.09.1998	38°41'N–26°35'E	Mud	77	1 *F. gutturosus*
3	22.01.1998 08.06.2004	38°41'N–26°37'E	Mud	71	2 *F. gutturosus* 2 *F. gutturosus*
4	15.04.1997	38°35'N–26°35'E	Mud	67	1 *F. gutturosus*
5	02.07.1997 14.10.1998	38°35'N–26°37'E	Mud	70	2 *F. gutturosus* 1 *F. gutturosus*
6	11.02.2000 19.03.2000	36°34'N–34°24'E	Mud	149	4 *F. gutturosus* 1 *F. gutturosus*
7	14.07.1998	35°10'N–32°50'E	Sandy mud with Shell fragments	69	1 *P. raduliferum*

newly described in part below new, poorly defined genera (Scheltema 1985), regarded at most as subgenera (Salvini-Plawen 1992). The present specimen was a juvenile with an atypical body shape, resembling *Prochaetoderma boucheti* Scheltema & Ivanov, 2000. Yet, its distally keeled elongate mantle scales and its pedal shield sclerites in two lateral rows of 6 and 4 scales, respectively, confirm the identity with *P. raduliferum* (Kow.), which is the type species originally described as *Chaetoderma radulifera* from the Sea of Marmara. In contrast to the distribution given earlier (Salvini-Plawen 1972, 1977, 1986, 1997) before separation into several species, this species is restricted to the eastern Mediterranean Sea (including the Adriatic), where it is well-documented from off Palestine at 65-238 m and from southern as well as western Cyprus at 90-180 m (unpubl. obs. S.-P.: Tel Aviv samples 1967-1968). The western-most record comes from off Malta (Mifsud 1996; the figure, however, erroneously shows a broken specimen of *Falcidens gutturosus*). There is in part geographic overlap or even co-existence with *Prochaetoderma (Spathoderma) alleni* (Scheltema & Ivanov, 2000), such as in the central Adriatic, off Corfu and off Malta (Mifsud 2000: figure labeled as *P. raduliferum*).

Chaetodermatidae Ihering, 1876 (Opinion 764, 1966)

Radula membrane forming a basal cone or basal plate, on top of which only one or two pairs of true teeth are located or these are lacking; radula apparatus flanked by one or two pairs of cuticular scales or plates; midgut with cuticular stomach shield.

Genus *Falcidens* Salvini-Plawen, 1968

Radula represented by one pair of sickle-shaped teeth or pincers, which proximally are in contact or possess a symphysis; pedal shield unitary.

Falcidens gutturosus (Kowalewsky, 1901)

The new records include 15 ex. from 6 sampling sites (Fig. 1 and Tab. 1).

Material: St. 1, 1 ex.; st. 2 , 1 ex.; st. 3, 2 ex. (1998) and 2 ex. (2004) st. 4, 1 ex.; st. 5, 2 (1997) and 1 (1998) ex.; st. 6, 4 ex. (11.02.2000) and 1 ex. (19.03.2000).

Remarks. Thirty-three *Falcidens* species are described, only two of which inhabit – endemically – the Mediterranean Sea. *F. gutturosus* is up to 15 mm long with a slender, tail-like posterior body and is characterised by the particular shapes of its mantle scales (Salvini-Plawen 1972, 1996). It is a fairly common species, recorded at depths of 40-866 m from the Sea of Marmara, the Aegean Sea, from off western Cyprus and off Palestine (unpubl. obs. S.-P.: Tel Aviv samples 1967-1968), the Adriatic and Ionic Seas, as well from the western Mediterranean to off Málaga/ Spain (Salvini-Plawen 1977, 1997).

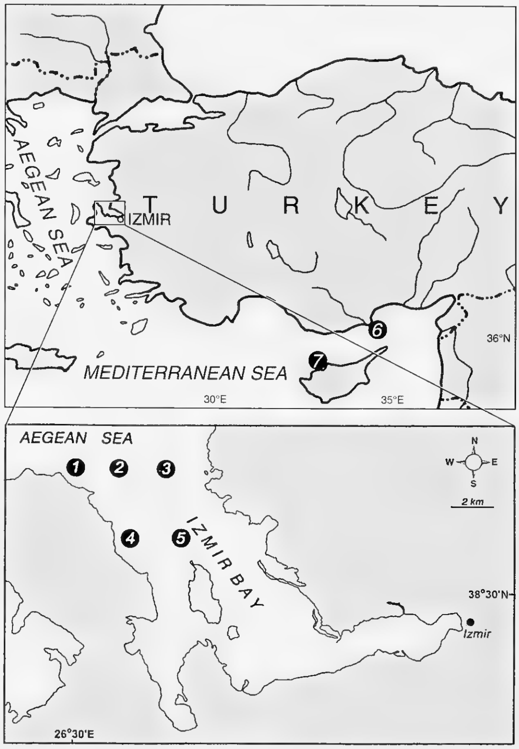

Fig. 1. Map of studied area with locations of stations where the specimens were sampled.

2. Solenogastres

There was one record with a single specimen of Solenogastres. It belongs to the Pararrhopaliidae within the order Cavibelonia and represents a species new to science.

Ordo Cavibelonia Salvini-Plawen, 1978

Solenogastres with acicular, generally hollow mantle slerites (spicules) in one or several layers, cuticle mostly thick with enclosed epidermal papillae; or with solid sclerites and moderately thick cuticle, but with a biserial radula and latero-ventral foregut glandular organs not of ducts with subepithelially arranged glandular cells.

Remarks. The main character of this taxon, the hollow acicular sclerites, exhibits a variety of different patterns; this, however, has no bearing on the monophyletic status of Cavibelonia (Salvini-Plawen 2003a, 2004). The developmental arrangement of these spicules differs in being either (1) in a radial or (2) a tangential alignment. The latter may be arranged (2a) in a single, obliquely oriented layer, or (2b) they are arranged in two or more fairly rectangularly intercrossing layers almost embedded within the cuticle (and also termed "skeletal"). Another criterion exists with respect to the enclosed cavity: the spicules may be either thick-walled or thin-walled. Distally, spicules may be hooked (or barbed), asymmetrically flattened and serrate, or asymmetrically axe-like enlarged (also termed "captate").

Pararrhopaliidae Salvini-Plawen, 1972

Parameniidae Simroth, 1893; Paramenidae Pruvot, 1902; Perimeniidae Nierstrasz, 1909; Pruvotiniidae Heath, 1911; Pruvotinidae Scheltema, 1998.

Solenogastres-Cavibelonia with distichous radula and ventral foregut glandular organs generally as subepithelially arranged follicles opening into a paired duct; with hooked mantle sclerites and/or a middorsal papillous pharyngeal gland and/or respiratory organs; see Salvini-Plawen 1978.

Genus *Eleutheromenia* Salvini-Plawen, 1967

Paramenia Pruvor, 1890, partim [non Brauer& Bergenstamm, 1889]; *Pruvotina* Cockerell, 1903, partim; *Perimenia* Nierstrasz, 1909, partim).

Definition. Solenogastres with hollow spicules in more than one layer, also including hooked ones; with common atriobuccal opening; radula distichous; paired ventral foregut glands each as subepithelial follicles with common outleading duct (type A); no dorsal papillous foregut gland, no receptacula seminis, unpaired secondary genital opening; no copulatory stylets, but with a paired bundle of abdominal spicules; with dorsoterminal sense organ, with respiratory organs.

Type species. *Paramenia sierra* Pruvot, 1890; Costa Brava/Spain.

Eleutheromenia carinata, spec. nov.
Figs 2-5

Diagnosis. Body 9 mm × 0.5 mm with 0.2 mm high middorsal carina; cuticle moderate, no epidermal papillae; spicules upright, tangential and intercrossed, as well as hooked, all hollow; elongate scales along the pedal groove. Abdominal spicules in a paired bundle of hollow straight elements. Radula teeth with distal hook and at most one median denticle, radula support with some small turgescent cells; ventral foregut glandular follicles with paired duct; midgut with rostral caecum, without serial pouches. Paired portion of the spawning ducts very short and curving dorsally, unpaired portion straight and wide with central outlet within ventral pallial cavity. Respiratory organs as densely arranged papillae. Aegean Sea, Bay of Izmir; 75 m.

Holotype: One ex. with elongate shape and distinct middorsal keel (Fig. 2; preserved 9 mm long, with keel 0.7 mm high) from the Bay of Izmir (Fig. 1 and Tab. 1: Station 1), 38°41'N, 26°32'E, at 75 m on mud (collected 29.04.1997). Ribbons of semithin serial sections (cs 1-2 µm) were made with glassknives and stained with toluidine-blue. The material (sclerites and series sections on slides, midbody in alcohol) deposited at ESFM museum (Ege University, Faculty of Fisheries, Turkey) no. ESFM-SOL/98-1.

Description

Body wall. The body is distinctly marked by a sharp middorsal carina which varies somewhat in its height along its course and shows, in the midbody, 10 slight lobulations. In this keel, most prominently in the anteriormost body, the loose circular musculature is split into a small subepithelial fraction (below the epidermis of the carina); the main fibres traverse the base of the keel and, in front of the midgut caecum, thus as usual delimit the body cavity. The space between this split musculature is filled by mesenchyme and groups of granulated (gland) cells. Elsewhere, the epidermis is likewise underlain by loose circular and longitudinal fibres. In the ventral body half, the longitudinal fibres are increasingly condensed into groups and there is a not very compact but distinct lateroventral pair of (occasionally bipartite) bundles.

The 5-10 µm high epidermis includes numerous gland cells but there are no epidermal papillae. The cuticle is on the average only 25-30 µm thick. The overall mantle includes six types of sclerites (Fig. 3). (a) The main type consists of straight to slightly bent, hollow spicules (80-150 µm × ∅ 7-9 µm), somewhat varying in their proximal portion and lying fairly parallel to the surface, arranged in two to three in-

Fig. 2. Solenogastres: *Eleutheromenia carinata*, spec. nov. (9 mm; anterior end above).

Fig. 3. *Eleutheromenia carinata*, spec. nov. (Solenogastres): mantle sclerites (see text); bar = 50 µm.

tercrossing layers. (b) A similar acicular type with a serration at one side of the solid distal portion (120-160 µm) is radially arranged in the anterior body only and extends beyond the cuticle. (c) Long and straight, thin-walled acicular spicules (150-250 µm × ∅ 9-11 µm) obliquely exceeding the cuticle towards dorsal and thus resulting in a somewhat rough body surface. (d) The characteristic type of curved bent spicules (80-110 µm) with the solid distal portion forming a hook with a tip at the turn are present at the dorsal body and densely arranged on the keel. (e) Along the pedal groove, elongate scales (75-90 µm × 14-15 µm) are present. In addition (f), lateral to these scales, there is a dense longitudinal arrangement of slender needles (175-200 µm × ∅ 5-6 µm), extending obliquely towards posterior.

In front of the opening of the mantle cavity protrudes a paired bundle each of 15-20 ventromedially directed abdominal spicules (Fig. 5). They are about 150 µm long and apparently hollow. At each side the sheath intrudes between the body wall musculature and the dorsoventral bundles and is laterally accompanied by its own longitudinal musculature.

Foot and Mantle cavity. The ciliated pedal pit forms, with its lateral rims, the single longitudinal fold which runs through the pedal groove. The foot ends with the opening of the abdominal spicules and does not enter the mantle cavity. The pedal gland is voluminous, filling with its cell follicles the entire space in the cerebral and preradular foregut region. There are two types of intermixed gland cells, (1) pale-staining ones with net-like fibrous content opening frontally and laterally into the pedal pit, and (2) cells with dense, dark-staining content opening dorsally into the pit. Only the dark staining cells continue as small sole gland follicles along the foot.

The mantle or pallial cavity possesses a 6-8 µm high epithelium which is protruded to numerous respiratory papillae (rather than plicae), filling the cavity also in front of its opening. They are densely packed; in cross sections, up to 19 radially arranged papillae are visible. The dorsofrontal transition from the hindgut is continuous; the unpaired ventral outlet of the spawnings ducts (secondary genital opening) is continuous with a groove of the mantle cavity bottom flanked by respiratory papillae.

Sensory system. The cerebral ganglia are fused and there are at least two pairs of small laterofrontal ganglia immediately adjacent to it, innervating the atrial region. The lateral body cords are loosely, the ventral ones more densely provided with nuclei. The (first) lateral ganglia lie close to the cerebral gan-

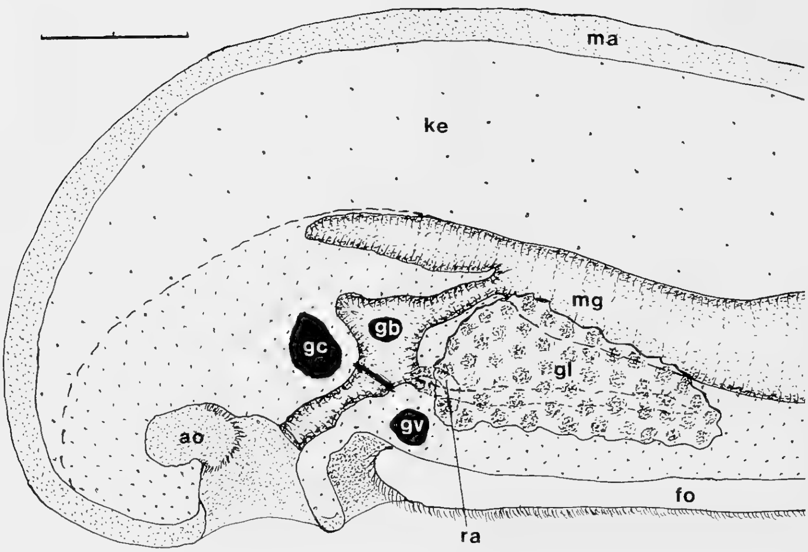

Fig. 4. *Eleutheromenia carinata*, spec. nov. (Solenogastres): organisation of anterior body (in preserved state); bar = 200 µm. Abbreviations: ao = atrial sense organ; fo = pedal fold (foot); gb = buccal ganglion; gc = cerebral ganglion; gl = ventral foregut glandular organ; gv = (first) ventral ganglion; ke = body keel; ma = mantle; mg = midgut; ra = radula sheath.

glion and are elongate (∅ 30 µm); the (first) ventral ganglia (∅ 50 µm) are located above the end of the pedal pit. The buccal ganglia (∅ 40 µm) are located fairly dorsolateral at the foregut, in front of the radula apparatus (Fig. 4). The suprarectal commissure interconnecting the ganglia posteriora superiora (alongside the curving pericardioducts) is differentiated far anterior to the anal opening; it is medullary and 120 µm long (∅ 25 µm).

The atrial or vestibular sense organ differentiates papillae which are bundled into groups up to four with a common trunk. As usual, the sensory area is bordered by a horseshoe-shaped ciliary fold, the dorso-posterior incurve excluding the buccal space which is continuous with the mouth. The dorsal folds end at half of the extension of the atrial roof in a common plate.

The single dorsoterminal sense organ is prominently differentiated close to the body end (Fig. 5).

Alimentary tract. The mouth opening is separated from the sensory region in the dorsoposterior area of the common, longitudinal atrio-buccal cavity (Fig. 4). A buccal space with folds leads into the pharyngeal foregut whose epithelium appears to be moderately cuticularised (microvilli?) and whose anterior is partly ciliated; the foregut is provided with weak musculature. A sphincter separates the widened portion between the cerebral ganglion and the radula apparatus; no subepithelial pharyngeal glands are discernible and there is no compacted (papillous) dorsal foregut gland. The (protruded) radula is very small, distichous, each tooth (15-20 µm high) with a distal hook and (probably) one median denticle. The radula support shows some small turgescent cells, as well as muscular and connective tissue. The ventral foregut glandular organs constist of cells packed into follicles which empty at each side into a distinct duct that opens lateroventrally of the radula. Dorsal and lateral subepithelial gland cells open into the anterior portion of the longitudinally folded, narrowed postradular foregut (esophagus); the latter opens without a sphincter into the ventral midgut. The midgut possesses a flat rostral caecum, paired in its anteriormost portion. The dorsoventral muscle bundles are not very compact and the inner ones already insert on the body wall at half height of the animal. They do not constrict the gut, which is well separated from the body wall. The midgut represents an unusual structure due to the differentiation of irregularly, dorso- and/or ventrolaterally arranged bulges with high, glandular (and deeply staining) epithelium that includes also nematocysts; the remaining epithelium is moderately high and bears a middorsal ciliary tract. In the region of the pericardium the midgut narrows and its ciliation spreads from the middorsal tract towards ventral. The hindgut lacks any visible demarcation against the dorsofrontal mantle cavity.

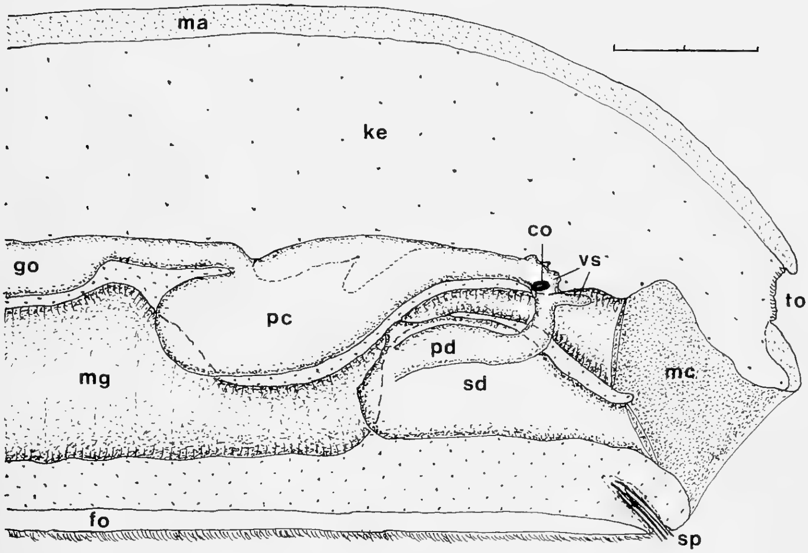

Fig. 5. *Eleutheromenia carinata,* spec. nov. (Solenogastres): organisation of posterior body (in preserved state); bar = 200 µm. Abbreviations: co = suprarectal commissure; fo = pedal fold (foot); go = gonad; ke = body keel; ma = mantle; mc = mantle cavity; mg = midgut; pc = pericardium; pd = pericardioduct; sd = spawning duct; sp = abdominal spicules; to = terminal sense organ; vs = vesiculae seminales.

Gonopericardial system. The two gonads in the present specimen are not yet fully developed and a paired lumen alongside the dorsal sinus is only sporadically visible. In the posterior body, however, the two gonadial tubes are present and show lateral sacks filled with sperm; these represent some kind of vesiculae seminales of the strongly protandric animals. The paired gonopericardial ducts are distinct and open dorsally into the pericardium which shows a paired anterior beginning. This voluminous cavity exhibits a paired dorsal ciliary tract . The heart is a mediodorsal invagination of the pericardial roof. The fused atrium is elongate and opens from ventral into the ventricle. There are two kinds of blood cells: round to oval, homogeneous ones (∅ 5-9 µm) with distinct nucleus, and oval to irregularly elongate, vacuolated or differently granulated cells (10-15 µm).

Posteriorly, the pericardium is a tube with paired dorsolateral ciliary tract; these tracts form by separation the ciliation of the pericardioducts. Close to and in the ventro-anterior curve of each duct, some small sacculations and a distinct, posteriorly directed vesicula seminalis are formed. The pericardioducts possess a cylindrical epithelium without longitudinal ridge or fold and are surrounded by musculature; in their anteriormost portion they widen and represent the laterodorsally curved continuation of the respective spawning duct. There are no receptacula seminis. The spawning ducts are fused along almost their entire extension; only the anteriormost portion is paired. The unpaired organ is voluminous and highly glandular; merely its central portion (flanked by the short blind endings of the lateral portions) becomes the short outlet. This outlet is continuous with the ventral wall of the mantle cavity and forms here a groove. There are no copulatory stylets.

Discussion

Referring to the definition of the genus *Eleutheromenia* (Salvini-Plawen 2003b, and above), the organisation described here is clearly congeneric. Presently, only the type species *E. sierra* (Pruvot, 1890) is known, geographically ranging from off the Costa Brava (northeastern Spain) to the Trondheim area (Norway) at 40-218 m depth (Salvini-Plawen 2003b). This species (length to height ratio approximately 6:1) is particularly characterised by a series of 15 prominent middorsal lobes forming a discontinuous keel (Pruvot 1891, Salvini-Plawen 2003b), whereas the current specimen (ratio 13:1) exhibits a continuous middorsal carina that does, however, vary somewhat in height. Whith regard to the remaining organisation, the general configuration straddles that of *E. sierra* and *E. carinata* spec. nov.

The particular organisation, however, includes several species-specific differences: With respect to the sclerites, there are no acicular spicules with a distal, harpoon-like indentation such as in *E. sierra.*

The mantle cavity forms numerous respiratory papillae The midgut is at a distance to the body wall and therefore not serially constricted to form ventrolateral pouches (as in *E. sierra*). The ciliary tracts in the pericardium run dorsally and the atrium/auricle of the heart is unpaired (lateral tracts and paired atrium in *E. sierra*). Apart from the keel, the configuration of the spawning ducts is the most obvious difference: in the present not yet fully animal they form an almost fused organ – only the anterior-most portion is paired and dorsally curved as a continuation of the pericardioducts. In *E. sierra* the spawning ducts are subdivided into a paired and an unpaired section which overlap somewhat and are not axially continuous (but interconnect dorsoventrally), whereas the pericardioducts clearly open without enlargement from laterodorsal into the paired section. The fused spawning duct opens by means of a central outlet at the bottom within the anterior mantle cavity, whereas in *E. sierra* the unpaired spawning duct narrows and the outlet opens into the anterior-most area of the cavity.

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References

Belyaev, G. M. 1966. Hadal bottom fauna of the world ocean. – Acad. Nauk. USSR, Inst Okeanology. Translated from Russian and published 1972 by the Israel Program for Scientific Translations, Jerusalem (ISBN 0 7065 1235 9): 1-199

Handl, C. & L. v. Salvini-Plawen 2001. New Solenogastres-Pholidoskepia (Mollusca) from the shelf region of Scandinavia. – Sarsia **86**: 367-381

– – & – – 2003. New records of Solenogastres-Cavibelonia (Mollusca) from Norwegian fjords and shelf waters including three new species. – Sarsia **87** (6): 423-450

Haszprunar, G. 2000. Is the Aplacophora monophyletic? A cladistic point of view. – Amer. Malacol. Bull. **15**: 115-130

Kowalevsky, A. 1901. Sur le genre *Chaetoderma*. – Archs Zool. exp. gén., sér. 3, **9**: 261-283

Mifsud, C. 1996. Living Mollusca from circalittoral coastal muds, off Western Malta. – La Conchiglia XXVIII (**279** Suppl.): 23-41

– – 2000. Notes on a few more living Mediterranean marine Mollusca from Malta. – La Conchiglia XXXII (**294-295**): 66-76

Pruvot, G. 1891. L'organisation de quelques Néoméniens des côtes de France. – Archs Zool. exp. gén., sér. 2, **9**: 699-810

Salvini-Plawen, L. v. 1971. Schild- und Furchenfüßer (Caudofoveata und Solenogastres). – Neue Brehmbücherei **441**: 1-95

– – 1972. Die Caudofoveata des Mittelmeeres und das Genus *Scutopus* (Mollusca, Aculifera). – Vth Europ. mar. Biol. Symp. (Piccin, Padova), (4): 27-51

– – 1977. Caudofoveata (Mollusca), Priapulida und apode Holothurien (*Labidoplax*, *Myriotrochus*) bei Banyuls und im Mittelmeer allgemein. – Vie et Milieu **27** (1), Ser. A: 55-81

– – 1978. Antarktische und subantarktische Solenogastres – eine Monographie 1898-1974. – Zoologica (Stuttgart) 44 (**128**): 1-315

– – 1985. Early evolution and the primitive groups. – In: The Mollusca (Academic Press) Vol. **10** (Evolution): 59-150

– – 1986. Caudofoveata e Solenogastres del Mediterraneo. – Boll. Malacol. **22**: 189-195

– – 1988. The structure and function of molluscan digestive systems. – In: The Mollusca (Academic Press) Vol. **11** (Form & Function): 301-379

– – 1992. On certain Caudofoveata from the VEMA-Expedition. – Proc. 9th int. Malacol. Congr. (E. Gittenberger & J. Gopuld eds; Unitas Malacologica, Leiden): 317-333

– – 1996. *Falcidens vasconiensis* spec. nov. (Mollusca, Caudofoveata) du plateau continental du Golfe de Gascogne. – Bull. Soc. zool. Fr. **121**: 339-345

– – 1997. Fragmented knowledge on West-European and Iberian Caudofoveata and Solenogastres (Mollusca). – Iberus **15** (2): 35-50

– – 2003a. On the phylogenetic significance of the aplacophoran Mollusca. – Iberus **21** (1): 67-97

– – 2003b. Contributions to West-Mediterranean Solenogastres (Mollusca) with three new species. – Iberus **21** (2): 37-60

– – 2004. Contributions to the morphological diversity and classification of the order Cavibelonia (Mollusca: Solenogastres). – J. Moll. Stud. **70**: 73-93

– – & G. Steiner 1996. Synapomorphies and plesiomorphies in higher classification of Mollusca. – In: Origin and evolutionary radiation of the Mollusca (J. Taylor ed.; Oxford Univ. Press): 29-51

Scheltema, A. H. 1985. The aplacophoran family Prochaetodermatidae in the North American Basin, including *Chevroderma* n.g. and *Spathoderma* n.g. (Mollusca: Chaetodermomorpha). – Biol. Bull. **169**: 484-529

– – 1995. *Falcidens poias*, a new species of chaetoderm Aplacophora from Rottnest Island, Western Australia (Chaetodermomorpha, Chaetodermatidae). – Moll. Research **16**: 45-49

– – & D. L. Ivanov 2000. Prochaetodermatidae of the eastern Atlantic Ocean and Mediterranean Sea (Mollusca, Aplacophora). – J. Moll. Stud. **66**: 313-362

– – & M. Tscherkassky & A. M. Kuzirian 1994. Aplacophora. – In: Harrison, F. W. & A. J. Kohn (eds.): Microscopic anatomy of Invertebrates, **5**: Mollusca I: 13-54. Wiley-Liss, New York.

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Laevipilina theresae, a new monoplacophoran species from Antarctica

(Mollusca)

Michael Schrödl

Schrödl, M. (2006): *Laevipilina theresae,* a new monoplacophoran species from Antarctica (Mollusca). – Spixiana **29/3:** 225-227

The monoplacophoran mollusc *Laevipilina theresae,* spec. nov. is described from a living specimen collected off Kapp Norwegia, Eastern Weddell Sea, at approx. 800 m depth. This is the third monoplacophoran species known from Antarctica. *Laevipilina theresae,* spec. nov. is unique in having its apex clearly surpassing the anterior shell margin and showing two concentric bulges around the base of the apex. The new species additionally differs from the sympatric *L. antarctica* Warén & Hain, 1992 due to its less depressed shell. Brown markings along the mantle and foot edges and in the mouth region indicate the presence of symbiotic bacteria as already known from *L. antarctica.*

Dr. Michael Schrödl, Zoologische Staatssammlung München, Münchhausenstr. 21, 81247 München, Germany; e-mail: schroedl@zi.biologie.uni-muenchen.de

Introduction

With a fossil record back to the Cambrian, Extant monoplacophorans are still amongst the most enigmatic and wanted molluscs. The 25 species known worldwide occur from approx. 200 m down to abyssal depths (see Warén & Hain 1992, Goud & Gittenberger 1993, Urgorri et al. 2005). Most records refer to empty shells or severely damaged specimens, only very few researchers were lucky enough to obtain and observe a living animal. In Antarctica, two species were previously known. *Micropilina arntzi* Warén & Hain, 1992 is a tiny species (approx. 1 mm) only known from the Lazarev Sea (Warén & Hain 1992). *Laevipilina antarctica* Warén & Hain, 1992 shows a much wider distribution on the Antarctic shelf and upper continental slope from the Lazarev Sea to the Eastern Weddell Sea (Warén & Hain 1992); a specimen recently found below 3000 m depth shows this species to be surprisingly eurybathic (Schrödl et al. 2006). During the EASIZ III expedition on RV "Polarstern", a completely intact, living *Laevipilina* specimen was sorted out from a bathyal sand sample. This specimen significantly differs from any other congener and is described as a new species herein.

Methods

During the ANT XVII-3 (EASIZ III) expedition on RV "Polarstern", any available sea bottom substrates such as boulders, stones, sand, and mud samples were carefully revised for monoplacophorans by the author. The single specimen (ZSM Moll 20050898) obtained was collected north off Kapp Norvegia, Antarctica, at Station PS67/138-1 (71°08.90'S 013° 12.80'W, 71°08.80'S 013°13.20'W), by an epibenthic sledge (EBS) at 765-840 m depth on sandy bottom, 11 April 2000. The entire EBS sand sample was sorted in a cooling container at 0 °C. The specimen was photographed and observed alive, then briefly relaxed in isotonic $MgCl_2$ solution, and fixed in glutaraldehyde. Finally, the specimen was embedded in Spurr's resin and serially sectioned, except for the periostracum which is preserved in ethanol 78 %.

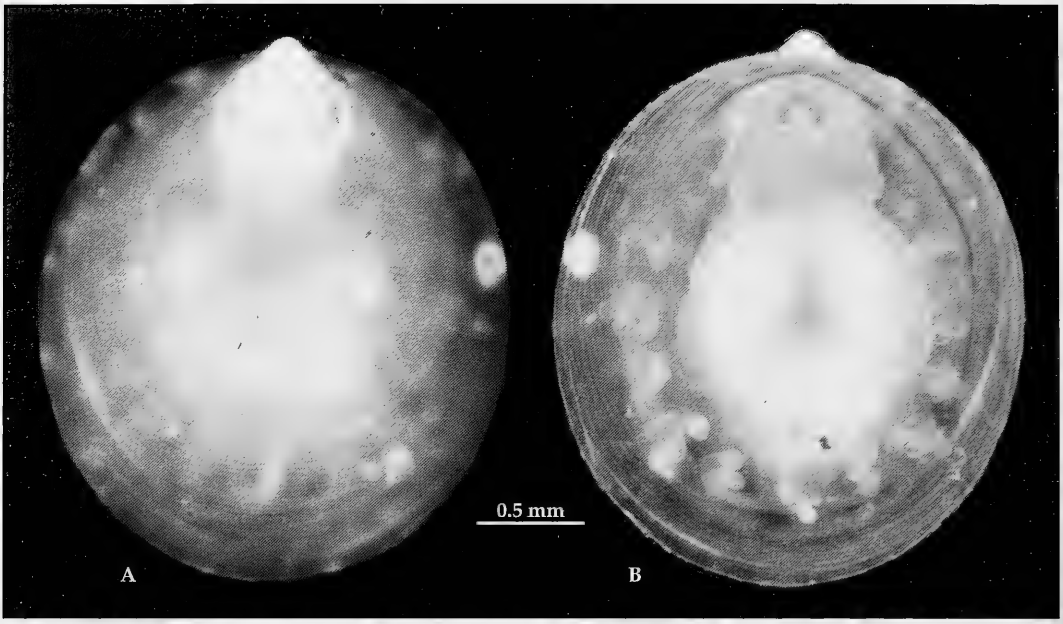

Fig. 1. *Laevipilina theresae*, spec. nov., living holotype. **A.** Dorsal view. Note the apex (at the top) surpassing the shell margin, and the diagnostic two concentric swellings separating the apex from the rest of the shell. **B.** Ventral view. Note the nearly circular sucker-like foot, the 5 pairs of gills serially arranged along the circumpedal mantle cavity, the elongate velar lobes (at the top), and the postoral tentacles in between velum and foot, having just a few short and inconspicuous projections.

Laevipilina theresae, spec. nov.
Fig. 1

Monoplacophora sp. Sirenko & Schrödl, 2001: 86.
Laevipilina sp. Schrödl, Linse & Schwabe, in review.

Holotype: Zoologische Staatssammlung München (periostracum: ZSM Moll. 20050898; plus series of histological and ultrastructural sections), collected by Michael Schrödl, 11 April 2000, from a sand sample obtained north of Kapp Norvegia, Antarctica, at 765-840 m depth.

Description

The living animal (Fig. 1) had a transparent shell and a whitish to slightly pinkish translucent body. Two pairs of dorsal pouches with brown dots were shining through the shell as were 8 pairs of shell muscles (Fig. 1A). In ventral view (Fig. 1B), the "head area", the foot edge and sides and the mantle edge was brownish, the anterior mantle edge was darker red-brown. Brown coloration referred to more or less densely arranged, minute brown dots.

The mouth area is very similar to that of *L. antarctica* as described by Warén & Hain (1992): velar lobes are elongated and nearly reach the anterior foot margin. The inconspicuous anterior lip is separated from the velum by a narrow groove. The posterior lip is a transverse swelling in its anterior part; swollen ridges project posterolaterally bearing just a few (up to 5) short and blunt postoral tentacles on each side. The foot is circular to slightly oval and sucker-like. There are 5 pairs of similar-sized gills with 3 digits arranged ventrolaterally along the circumpedal mantle cavity (Fig. 1B). The anus opens ventroterminally as a simple hole.

The shell is limpet-like depressed and fragile. Dimensions are: 2.5 mm length, 2.1 mm width, and 1 mm height. The apex is dorsally rounded, anteriorly directed, and surpasses the anterior shell margin. The base of the apex bears two concentric, whitish bulges. The shell slope is slightly convex, with a depression at the base of the apex. The aperture is nearly oval, only slightly narrower anteriorly. The shell edge is sharp. The shell surface is smooth except for showing fine concentric growth marks. The periostracum is net-like sculptured, with fine radial ridges crossed by concentric growth marks; dimensions and proportions of spaces vary considerably.

Etymology. *Laevipilina theresae*, spec. nov. is named after my daughter Theresa who had to let go her dad to sea for three months.

Remarks

Previously, four *Laevipilina* species were considered to be valid (Urgorri et al. 2005); all are characterized by their small sizes (2-3 mm) and their (nearly) smooth and fragile, moderately elevated shells. The soft parts of the specimen examined herein closely resemble previous descriptions of *Laevipilina antarctica* by Warén & Hain (1992) and Schaefer & Haszprunar (1996), especially with regard to the poorly developed postoral tentacles and the presence of 5 pairs of gills. Its shell, however, with a height/length relation of 0.4 is less depressed than that of the holotype of *L. antarctica* (0.24) and those of other recently collected and measured specimens of *L. antarctica* (0.29-0.32; see Schrödl et al. 2006). The apex of *L. antarctica* is rather stout ("globular") and does not project the anterior shell border (Warén & Hain 1992, Schrödl et al. 2006), while being more pointed and clearly surpassing anteriorly in *L. theresae*, spec. nov. The only congener with similar shell proportions (see comparison by Urgorri et al. 2005) and a (slightly) projecting apex is *L. rolani* Warén & Bouchet, 1990, from off northwestern Spain; however, this species clearly differs in having 15-20 digitiform postoral tentacles (see Warén & Bouchet 1990). A second, somewhat damaged specimen assigned to *L. rolani* by Urgorri & Troncoso (1994), however, has an apex that does not surpass the anterior shell margin and no postoral tentacles could be detected. *Laevipilina theresae* differs from any known congeners due to the presence of two unique concentric swellings at the base of the apex.

Interestingly, *L. theresae* shows the same brown dots in the head region and along the foot and mantle edges (but not on the gills) as documented for living *L. antarctica* (see Warén & Hain 1992: fig. 19) and still present (but faded) in a preserved abyssal specimen (Schrödl et al. 2006). In *L. antarctica*, such brown dots appear to correspond with symbiotic bacteria associated to the microvillar border and aggregated into special epidermal bacteriocytes described by Haszprunar et al. (1995). Thus, the presence of bacteria can be presumed for *L. theresae* as well, and will be substantiated by ultrastructural study in the future. Revealing the exact function of such symbiotic bacteria and confirming their potential occurrence in further *Laevipilina* species with dark spots along the mantle margin, e.g. *L. rolani* and *L. cachuchensis* Urgorri, García-Álvarez & Luque, 2005, might significantly contribute to understand the ecology of still "living fossil" monoplacophorans.

Acknowledgements

My gratitude goes to Wolf Arntz (AWI) for letting me participate at the EASIZ III "autumn" expedition to Antarctica. Anne-Nina Loerz (NIWA) did a great job driving the EBS under heavy storm condition. Thanks to Jens Bohn (ZSM) and Ole Ziemer for help and mental support during sorting innumerable sand samples. Gerhard Haszprunar (ZSM) is especially thanked for directing my attention to these fascinating animals and for reading the typescript.

References

Goud, J. & E. Gittenberger 1993. *Rokopella brummeri* sp. nov., a new monoplacophoran species from the mid-Atlantic Ridge in the northern Atlantic Ocean (Monoplacophora, Neopilinidae). – Basteria **57**: 71-78

Haszprunar, G., Schaefer, K., Warén, A. & S. Hain 1995. Bacterial symbionts in the epidermis of an Antarctic neopilinid limpet (Mollusca, Monoplacophora). – Phil. Trans. R. Soc. Lond. B **347**: 181-185

Schaefer, K. & G. Haszprunar 1996. Anatomy of *Laevipilina antarctica*, a monoplacophoran limpet (Mollusca) from Antarctic waters. – Acta Zool. (Stockholm) **77**: 295-314

Schrödl, M., Linse, K. & E. Schwabe 2006. Geographical and bathymetrical distribution, with first abyssal record of *Laevipilina antarctica*. – Polar Biol. **29**: 721-727

Sirenko, B. I. & M. Schrödl 2001. Mollusc biodiversity and ecology. – Ber. Polarforsch. Meeresforsch. **402**: 85-95

Urgorri, V., García-Álvarez, O. & Á. Luque 2005. *Laevipilina cachuchensis*, a new neopilinid (Mollusca: Tryblidia) from off North Spain. – J. Moll. Stud. **71**: 59-66

Warén, A. & P. Bouchet 1990. *Laevipilina rolani*, a new monoplacophoran from off Southwestern Europe. – J. Moll. Stud. **56**: 449-453

– – & S. Hain 1992. *Laevipilina antarctica* and *Micropilina arntzi*, two new monoplacophorans from the Antarctic. – Veliger **35**: 165-176

13. Kulzer, E.: Chiroptera. Volume 3: Biologie. – Handbuch der Zoologie Band 8, Mammalia, Teilband 62. – Walter de Gruyter, Berlin, New York, 2005. 250 S., 60 Abb. ISSN 1861-4388.

Fledermäuse erfreuen sich zunehmender Popularität, nicht nur im Arten- und Naturschutz, sondern auch in der systematischen, morphologischen und ökologischen Grundlagenforschung. So ist die vorliegende Neuerscheinung bereits der dritte Band in der renommierten Handbuchreihe, der sich mit dieser Tiergruppe beschäftigt. Der erste Teilband (Koopman 1994) enthielt eine systematische Aufzählung aller Fledermausarten und ihrer diagnostischen Merkmale, der zweite Teilband (Erkert 2002) widmete sich der Flugbiologie, der Morphologie und Funktion der sensorischen Systeme sowie der Aktivitätsperiodik. Der nun vorgelegte dritte Band behandelt die Biologie, genauer gesagt die Ökologie und das Verhalten dieser Tiergruppe. Der Autor ist ein international renommierter Fledermausforscher, dessen Name seit Jahrzehnten mit der Fledermausforschung eng verbunden ist. Das aktuelle Wissen über Wohnräume, Nahrung und Ernährung, Fortpflanzung und Entwicklung, Temperaturregulation, Überwinterungsstrategien und Sozialverhalten wird hier in ausführlicher, aber gleichzeitig äußerst übersichtlicher Form dargestellt. Hervorzuheben ist, daß über eine ordnungstypische Darstellung hinaus ganz detailliert auf Besonderheiten bei den einzelnen Fledermausfamilien eingegangen wird, wobei die morphologischen, physiologischen und ethologischen Grundlagen der einzelnen Themenkomplexe ausführlich beleuchtet werden. Die Kompetenz des Autors und die Ausführlichkeit der Darstellung wird schon durch das Literaturverzeichnis dokumentiert, das 49 Seiten umfaßt. Das Buch ist trotz seines hohen Preises eine empfehlenswerte Informationsquelle für jeden Fledermausinteressierten.

R. Kraft

14. Wood, T. S. & B. Okamura: A new Key to the Freshwater Bryozoans of Britain, Ireland and Continental Europe, with Notes on their Ecology. – Freshwater Biological Association Scientific Publication No. 63, Freshwater Biological Association, Ambleside, 2005. 113 pp. ISBN 0-900386-72.

Bryozoans are benthic and mostly colonial, filter feeding aquatic animals. Although the number of fresh water bryozoans is relatively low, these tiny "moss animals" are more abundant and wider distributed than generally known. In addition to known interesting biological features, like transportation of dormant reproduction stages (=statoblasts) by birds, recently their role as hosts for parasites causing fish diseases has been discovered. This resulted in increasing attention on these animals. The present book is a new guide to fresh water bryozoans of Europe by the world leading experts. Chapters dealing with topics like morphological features, biology, systematics and evolution, history of studies, study methods, classification, identification key and characterization of species provide a most comprehensive general view of that group. In places it may be somewhat overdone in structure; since it does not seem useful one has to go back to the systematic list to find the species authors when dealing with the characterization of species. The book contains numerous illustrations of high quality. Schematic drawings, scanning electron micrographs of statoblasts, photographs of habitats and colonies as well as micrographs of living animals portray these most attractive creatures from all aspects. The identification key in most cases refers to structural details of the minute statoblasts, which can only be resolved with high level microscopic gear. Therefore, in terms of detailed taxonomic purposes, the book is intended for scientific institutions. However, it also seems very appealing for the non-specialist, who can learn a lot on the biology of a taxon he previously might not even have been aware of.

B. Ruthensteiner

15. Bellmann, H.: Der Kosmos Heuschreckenführer. Die Arten Mitteleuropas sicher bestimmen. – Frankh-Kosmos Verlag, Stuttgart, 2006. 350 S. ISBN 3-440-10447-8.

Wer sich schon länger mit Heuschrecken beschäftigt, wird dieses Buch sicher schon kennen. Es wurde schon vor etlichen Jahren herausgegeben und ist bei vielen Freunden der Heuschrecken bekannt und beliebt, aber inzwischen vergriffen ("Heuschrecken beobachten – bestimmen", 2. Aufl. 1993; Naturbuch Verlag, Augsburg). Dieses sehr gute Buch wurde nun in verbessertem Layout, mit farbigen Seitenüberschriften und Markierungen vom renommierten Kosmos Verlag übernommen.

Das Buch enthält Bestimmungsschlüssel und Steckbriefe zu allen mitteleuropäischen Arten, die dadurch sicher angesprochen werden können. Darüber hinaus werden auch eine Reihe von Arten, die der Leser eher im Urlaub in den nördlichen Mittelmeerländern finden wird, dargestellt. Sehr praktisch ist deshalb auch der jeweils angebrachte Hinweis, wenn eine der besprochenen Arten nicht in Deutschland vorkommt. Das Buch ist mit über 300 hervorragenden Farbfotos illustriert, die fast alle vom Autor selbst gemacht wurden. Darüber hinaus ist das Werk durch einen Bestimmungsschlüssel, Gesangsdiagramme und einen guten einführenden Text zur Biologie der Heuschrecken abgerundet. So weit ich beurteilen konnte, sind sowohl die Abbildungen als auch der Text kaum aktualisiert worden. Wenigstens neuere Veröffentlichungen im Literaturverzeichnis wurden ergänzt. Insgesamt aber muß man wohl auf eine Neuauflage hoffen.

Dennoch ist es zu begrüßen, daß dieses schöne Werk wieder zu kaufen ist, und man kann es allen empfehlen, die sich mit diesen häufigen, auffälligen und interessanten Insekten beschäftigen wollen. Das Buch kann uneingeschränkt benutzt werden, sei es als fachliche Einführung, als Nachschlagewerk oder einfach zum Schmökern.

K. Schönitzer

SPIXIANA	**29**	3	229–233	München, 01. November 2006	ISSN 0341-8391

Contributions to the knowledge of the Triviidae. XIV. A further new *Triviella* Jousseaume, 1884 from South Africa.

(Mollusca: Gastropoda)

Dirk Fehse

Fehse, D. (2006): Contributions to the knowledge of the Triviidae. XIV. A further new *Triviella* Jousseaume, 1884 from South Africa. – Spixiana **29/3:** 229-233

A new species of the gastropod family Triviidae Troschel, 1863 is described as endemic from South African offshores. The new species belongs to the genus *Triviella* Jousseaume, 1884. Type species of the genus is *Cypraea oniscus* Lamarck, 1810. The new species *Triviella williami*, spec. nov. is compared with the following similar species of the genus from the same area: *Triviella magnidentata* (Liltved, 1986), *Triviella rubra* (Shaw, 1909) and *Triviella phalacra* Schilder, 1930. All five specimens of the new species differs from its most similar congener, *T. rubra*, besides other features by the narrower aperture, by the stronger, more numerous posterior basal folds and especially by the colour pattern of the animals.

Dirk Fehse, Nippeser Str. 3, D-12524 Berlin, Germany;
e-mail: dirk.fehse@ftk.rohde-schwarz.com

Introduction

Already during the description of *Triviella insolita* Fehse (in press) and the accompanied examination of related species it was noticed that Liltved's specimen from the Buffelsjacht area (Litlveld 2000: text figs. 233 and 234 left picture) represented a new species clearly distinguished from *Triviella magnidentata* (Liltved, 1986) by the shell morphology and the animal. Unfortunately, not enough specimens were available to describe it together with *T. insolita*. Recently, it was possible to examine the collection of the late Dr. Dr. h.c. Artur Roll. Within his collection two additional specimens could be found. Now five specimens confirm the constancy in its shell morphology different to the congenering species. Therefore, this species could be described as *Triviella williami*, spec. nov.

Abbreviations

DFB	collection Dirk Fehse, Berlin, Germany.
ZSM	Zoological State Collection Munich, Germany.
LT	absolute number of labral teeth
CT	absolute number of columellar teeth

Triviella williami, spec. nov.

Figs 1-4

Types. Holotype: Off Cape St. Francis, eastern Cape Province, South Africa; dived in 40 m; length: 17.1 mm; width: 13.1 mm; height: 10.9 mm; LT 12; CT 14 (ZSM, coll. No. 20051497). – **Paratypes:** No. 1: Off East London, eastern Cape Province, South Africa, dredged in 100 to 120 m; length: 15.5 mm; width: 12.4 mm; height: 9.9 mm; LT 11; CT – subadult (ZSM, coll. No. 20051498); No. 2: Off west coast of Cape Peninsula, Cape Province, South Africa, alive on reef at 35 m; length: 20.1 mm; width: 15.5 mm; height: 12.6 mm; LT 12; CT 15 (DFB coll. No. 5189); No. 3: Off East London, eastern Cape Province, South Africa, dived at 19 m; length: 16.5 mm; width: 13.4 mm; height: 10.6 mm; LT 10; CT 14 (DFB coll. No. 8315); No. 4: Off S of Durban, KwaZulu-Natal, South Africa; ex pisce; length: 20.4 mm; width: 15.9 mm; height: 13.1 mm; LT 12; CT 15 (DFB coll. No. 8415).

Description of holotype

Shell (15 to 24 mm) medium-sized, lightweight, solid and sub-pyriform. Spire slightly elevated. Body whorl sub-triangular, inflated and rounded, about 95 % of total height, with both terminals produced

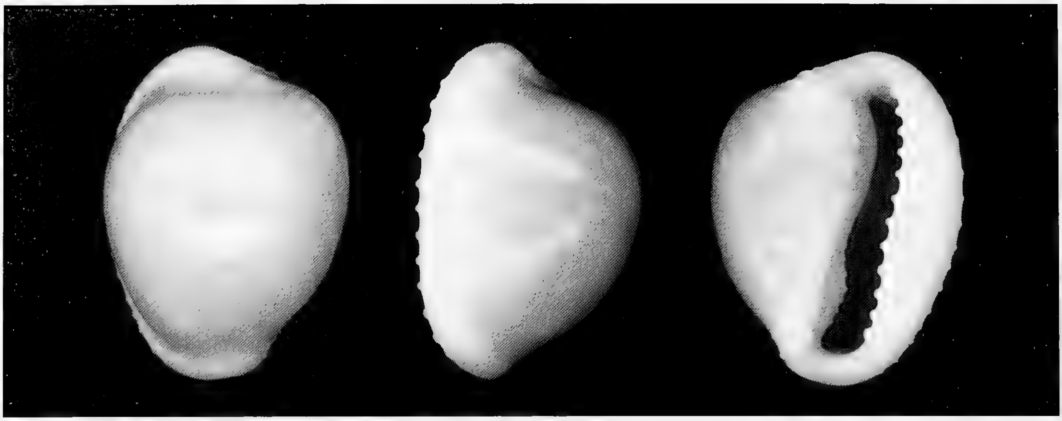

Fig. 1. *Triviella williami*, spec. nov., Holotype, ZSM, coll. No. 20051497.

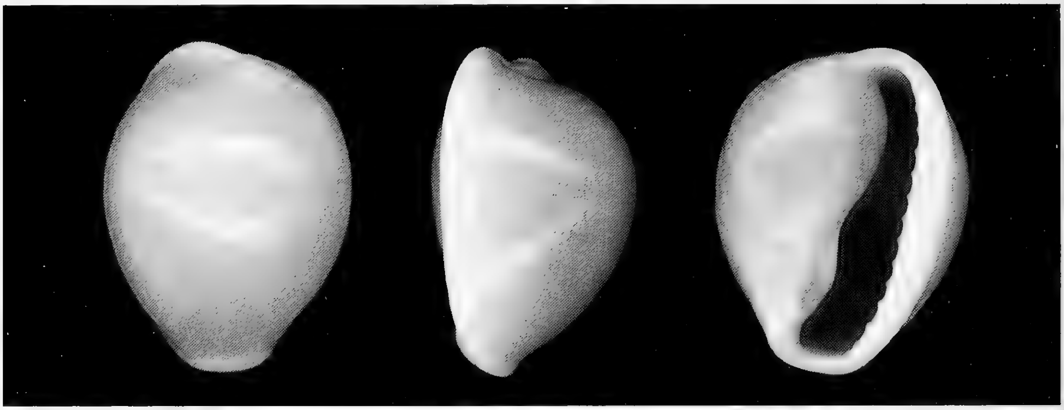

Fig. 2. *Triviella williami*, spec. nov., Paratype 1, ZSM, coll. No. 20051498.

but the posterior only slightly so. Terminal tips blunt. Dorsum roundly elevated with a hump at its posterior third, smooth. Ventrum rounded and smooth with straight terminals. Aperture fairly narrow over its entire length, widened only slightly at the fossular section, nearly straight. Labrum roundly callused, narrow, slightly curved, keeled towards its inner margin. Outer margin of lip roundly callused with a small shoulder. The labrum bears on its inner margin 11-14 coarse irregular denticles. The denticles are continued as strong folds onto the labrum and its suture but terminate immediately on the dorsal side margin. The siphonal and anal canals follow the shell profile. Both bordered adapically and abapically by callused and rounded ventral sidewalls. Columella concave, narrow and tapering steeply inwards. Along the aperture is a roundly callused parietal lip that bears 10-12 fine denticles with large interstices. The fine columellar denticles are continued as very fine folds onto the anterior columella but especially onto the fossula. The two to four columellar denticles are also continued anteriorly and posteriorly as ventral folds. Fossula concave and delimited from the rest of the columella by a strong indentition. The inner fossular edge protruded and denticulated.

The dorsal shell colour is brownish purple. All callused parts – the ventrum, labrum, terminals and the spire – are white.

Variation. All available specimens are very uniform in shell morphology. However, sometimes all columellar denticles are continued as folds onto the columella (paratype 4). The shell colour can be also brownish yellow and the labral folds are slightly further continued onto the dorsum (Liltveds specimen from Buffelsjacht area [Liltveld 2000: text fig. 233]; its whereabouts is unknown [Liltved pers. comm.]).

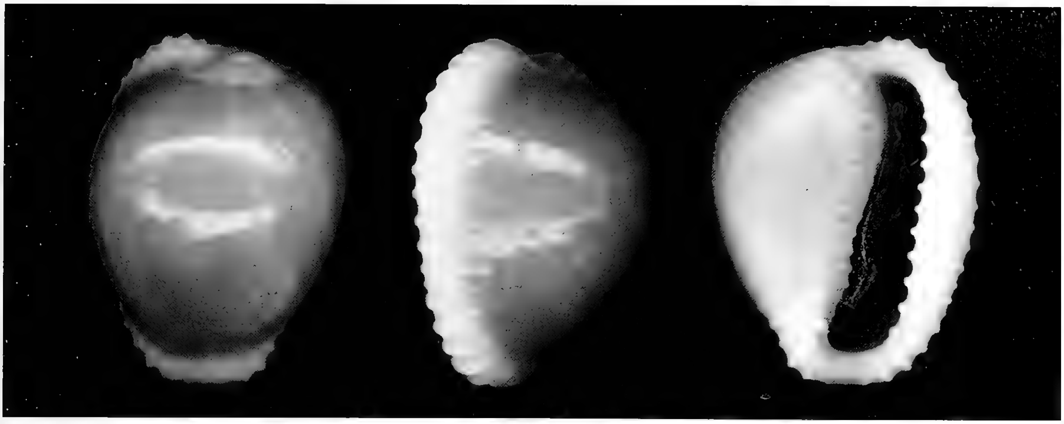

Fig. 3. *Triviella williami*, spec. nov., Paratype 2, DFB, coll. No. 5189.

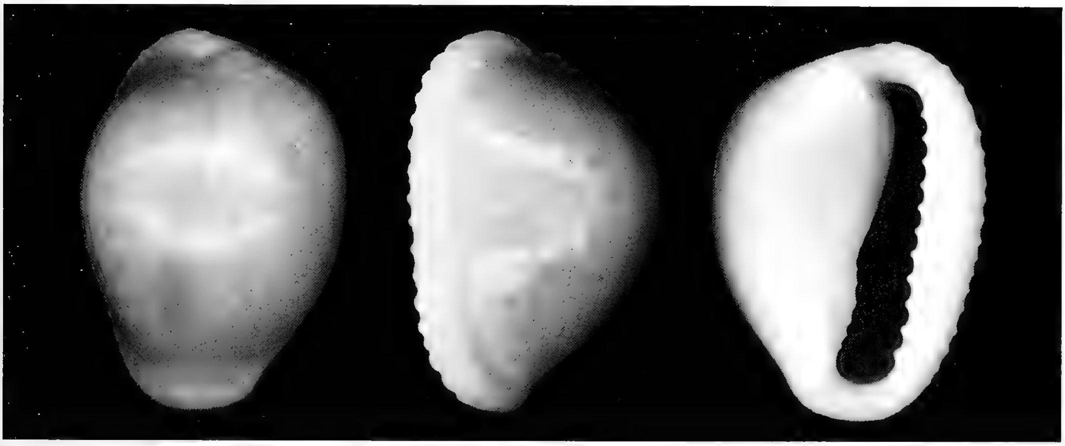

Fig. 4. *Triviella williami*, spec. nov., Paratype 3, DFB, coll. No. 8315.

External morphology

The fleshy mantle lobes of *Triviella williami*, spec. nov. collected at the Buffelsjacht area (Liltved 2000: left picture of text fig. 234), southwestern Cape Province, were opaque white and densely studded with fine, slightly protuberant yellowish white specks. The elongate recurved siphon was translucent without any markings. The slightly translucent cephalic tentacles were slenderly cylindrical and rounded apically with very small black eyes towards their bases. The opaque white foot was bulky and possessed a pronounced anterior muscular rim.

Etymology. The new species is named in honour of William Rune Liltved who has contributed much to the knowledge of the Ovulidae and Triviidae of southern Africa.

Distribution. The new species is known from the Atlantic coast of the Cape Peninsula, western Cape Province, to East London, eastern Cape Province.

Discussion

Triviella williami, spec. nov. differs from *Triviella magnidentata* (Liltved, 1986) in being sub-pyriform with a dorsal hump at its posterior third and the brownish yellow to brownish purple coloration. The animal of *T. magnidentata* is translucent with opaque white specks and very small red-brown dots and it imitates strikingly the compound tunicates that they are associated with (compare Liltved 2000: text figs 234 right picture, 235 and 236). In contrast the animal of *T. williami* is opaque white with yellowish white specks and it lacks off any dots.

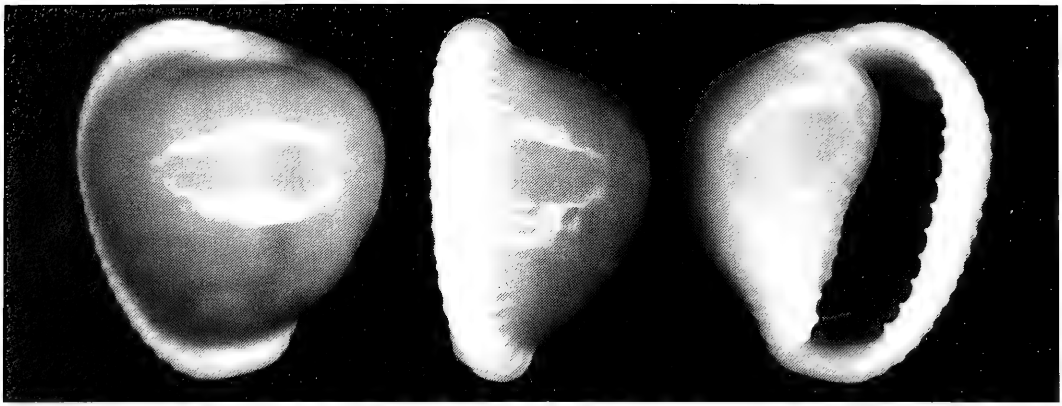

Fig. 5. *Triviella rubra* (Shaw, 1909), DFB, coll. No. 5462A. Off East London, eastern Cape Province, South Africa; alive on reef at 40 m.

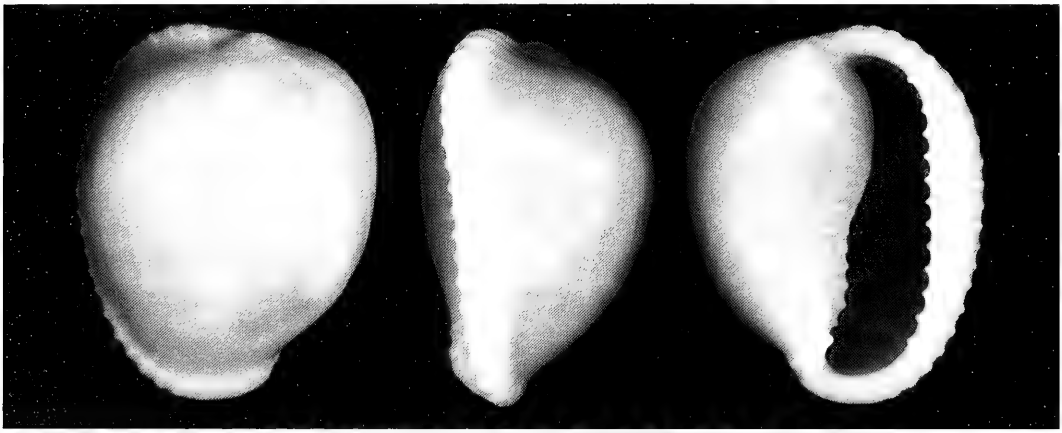

Fig. 6. *Triviella rubra* (Shaw, 1909), DFB, coll. No. 5462B. Off East London, eastern Cape Province, South Africa; alive on reef at 40 m.

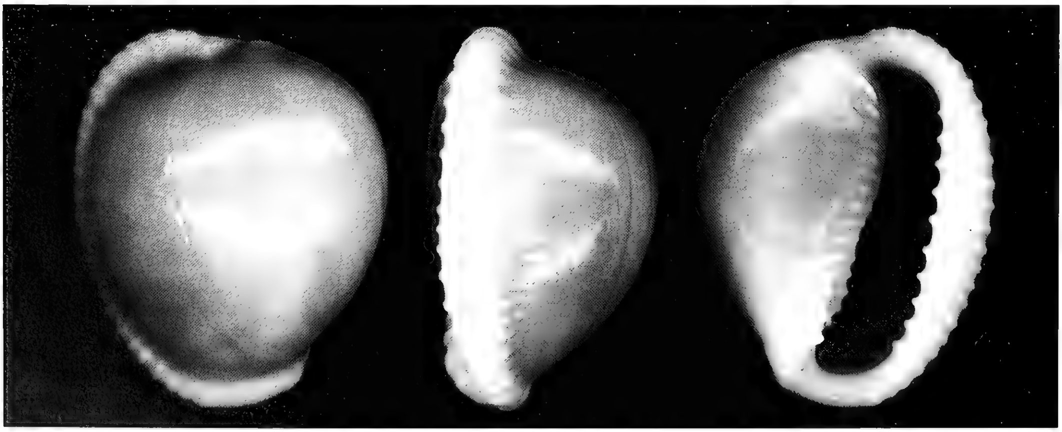

Fig. 7. *Triviella rubra* (Shaw, 1909), DFB, coll. No. 5462C. Off East London, eastern Cape Province, South Africa; alive on reef at 40 m.

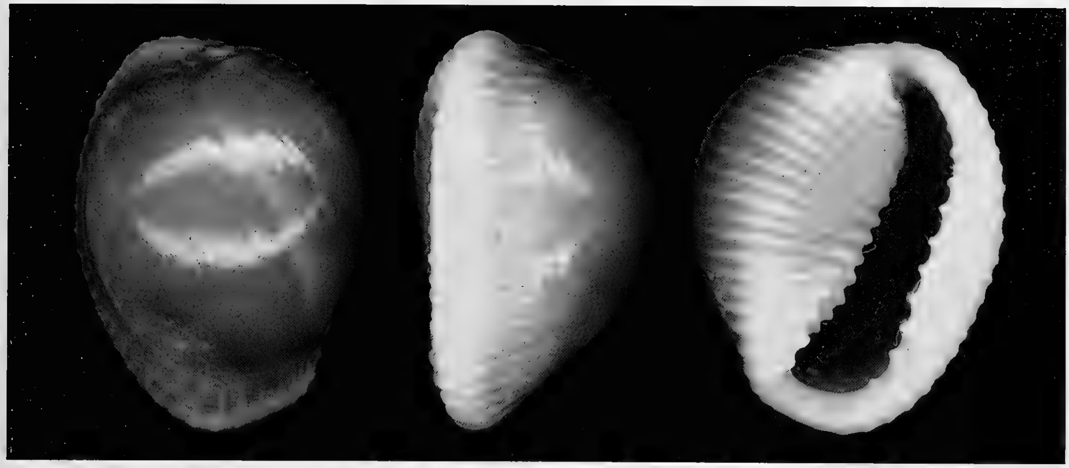

Fig. 8. *Triviella phalacra* Schilder, 1930, DFB, coll. No. 5433. Off East London, eastern Cape Province, South Africa; fresh dead in rock pool.

The new species differs from its congener *Triviella rubra* (Shaw, 1909) that shares the same shell coloration and a similar shell morphology by the narrower aperture, the fossula with finer and slightly more numerous folds, the less numerous, finer anterior basal folds and by the stronger, more numerous posterior basal folds. The animal of *T. rubra* (compare Liltved 2000: text fig. 229) with its creamy coloration and dark brown ocelli, spots and band differs essentially from *T. williami*, spec. nov.

Also the second congener of *T. williami*, spec. nov. – *Triviella phalacra* Schilder, 1930 – from the eastern Cape Province has a similar shell coloration but differs from the new species by the completely ribbed base and the less thickened labrum.

References

Fehse, D. in press. Contributions to the knowledge of the Triviidae (Mollusca: Gastropoda). XIII. A new *Triviella* Jousseaume, 1884 from South Africa. – Schr. Malakozool.

Liltved, W. R. 2000. Cowries and their relatives of Southern Africa. A study of the southern African Cypraeacean and Veluinacean gastropod fauna. – Gordon Verhoef, Seacomber Publications, 2nd enlarged edition: 1-224, 298 + numerous unnumbered text-figs.

16. Rose, K. D. & J. D. Archibald (Hrsg.): The rise of placental mammals: origins and relationships of the major extant clades. – The John Hopkins University Press, Baltimore and London, 2005. 259 S. ISBN 0-8018-8022-X.

Neue Fossilfunde sowie die Entwicklung von Computerprogrammen, die morphologische Merkmalsausprägungen und DNA-Daten zu kombinierten Stammbäumen verarbeiten können, haben die Großgruppensystematik der Säugetiere innerhalb weniger Jahre geradezu revolutioniert und einige der traditionellen Ordnungssysteme umgestoßen. Mit dem vorliegenden Buch wird nun endlich ein Werk vorgelegt, in dem die neuesten Forschungsergebnisse zur Evolution und Phylogenie plazentaler Säugetiere zusammenfassend dargestellt werden.

In den einleitenden Kapitel werden unter anderem die autapomorphen Merkmale beschrieben, die die plazentalen Säugetiere charakterisieren und gegenüber ihren kreidezeitlichen Vorläuferformen abgrenzen. Der systematische Hauptteil behandelt die stammesgeschichtliche Entwicklung der einzelnen Ordnungen bzw. Überordnungen und ihre verwandtschaftlichen Beziehungen zueinander. Auf der Grundlage morphologisch-anatomischer Merkmale und – soweit verfügbar – molekularbiologischer Daten werden Kladogramme erstellt und moderne Klassifizierungskonzepte vorgestellt und diskutiert. Dabei werden die phylogenetischen Beziehungen zwischen den rezenten Taxa und ihren fossilen Stammgruppen auf der Grundlage synapomorpher Merkmale, also ganz im Sinne der Hennigschen Systematik, erschlossen und mit modernen kladistischen Methoden begründet.

Wer die einschlägige Literatur nicht kontinuierlich verfolgt hat, wird einige überraschende Umgruppierungen feststellen: so gehören Tenreks und Goldmulle nicht mehr zu den "Insectivora" im traditionellen Sinn, sondern werden mit den Elefanten, Schliefern, Erdferkeln und Seekühen in der Überordnung "Afrotheria" vereint. Wale und Paarhufer sind Schwestergruppen und werden in einer gemeinsamen Ordnung oder Kohorte ("Cetartiodactyla") vereint.

Die Beiträge des Buches stammen von namhaften Säugetiersystematikern bzw. -paläontologen, die auf ihrem jeweiligen Fachgebiet bemerkenswerte Forschungsergebnisse vorgelegt und der Säugetierphylogenie entscheidende Impulse gegeben haben. Es ist unbestreitbar, daß die moderne Molekularbiologie zahlreiche offene Fragen auch der Säugetiersystematik klären konnte. Das Buch zeigt aber auch deutlich, welchen enormen Erkenntnisgewinn die sorgfältige Auswertung morphologisch-anatomischer Merkmale für die Erforschung der Stammesgeschichte der Säugetiere erbracht hat. R. Kraft

17. Hecker, F. & K. Hecker: Tiere & Pflanzen – Bach und See, 140 Arten einfach bestimmen. – Franckh-Kosmos-Verlags-GmbH & Co. KG, Stuttgart, 2006. 93 S. ISBN 3-440-10216-5.

Offensichtlich lagen bei den Autoren eine Reihe von eigenen guten Tier- und Pflanzenbildern vor (199 Farbfotos), um die ein erklärender Rahmen geschaffen werden sollte. Hier ist ein Büchlein entstanden, das in eine Reihe von unzähligen vergleichbaren lückenhaften "Feldführern" einzureihen ist. Auch sind auf dem Markt deutlich bessere und umfassendere vorhanden. Der im Nebentitel noch provokant angegebene Hinweis, daß es sich um eine Bestimmungshilfe handelt, wobei nur 140 Arten gegenüber Tausenden zu erwartenden abgehandelt werden, suggeriert einmal mehr, daß das Bestimmen von Tieren sehr leicht fällt und jeder Laie sich mit einem derartigen Büchlein die den Lebensraum von Bach und Teich erschließen kann. Die Hinweise zu Artenzahlen oder Vergleichsarten werden kaum wahrgenommen. Auch sind die Art- und Großgruppenhinweise dürftig, und es fehlen die stimulierenden Details. Es handelt sich bei diesem Buch um eine Ansammlung netter Bilder und einen winzigen Ausschnitt der Lebewelt unserer heimischen Gewässer, aber auch nicht um mehr.

E.-G. Burmeister

18. Muus, B. J. & J. Nielsen J. G.: Die Meeresfische Europas in Nordsee, Ostsee und Atlantik. – Franckh-Kosmos Verlags-GmbH & Co. KG, Stuttgart, 2005. 336 S. ISBN 3-440-07804-3.

Ein Bestimmungsklassiker ("Collins Guide to the Sea Fishes of Britain and Northwestern Europe" von Muus und Dahlstrom) wurde überarbeitet und stark erweitert. Die meisten Zeichnungen wurden übernommen, 101 zusätzliche Arten von Nyström neu gezeichnet. Die Bestimmungsschlüssel erlauben selbst Laien, auch seltene Arten sicher zu identifizieren. Die neu überarbeitete Auflage ist ein würdiger Nachfolger für den Muus/Dahlström – das Buch ist uneingeschränkt als Feldführer zu empfehlen. U. Schliewen

19. Hecker, F.: Welcher Fisch ist das? Die Süßwasserfische Europas. – Franckh-Kosmos Verlags-GmbH & Co. KG, Stuttgart, 2005. 139 S. ISBN 3-440-10241-6.

Das kleine Bändchen liefert Bilder und einige Grundinformationen zu vielen Süßwasserfischen des deutschen Sprachraumes. Es kann als erste Orientierungshilfe für die Bestimmung und ökologische Einordnung einheimischer Arten dienen, da die meisten Photos und Zeichnungen von guter Qualität sind und die allgemeinbiologischen Informationen in den meisten Fällen nicht falsch sind. Der aktuelle Stand der Taxonomie und Diversität der mitteleuropäischen Süßwasserfische ist allerdings nicht aufgearbeitet. U. Schliewen

SPIXIANA	**29**	3	235–236	München, 01. November 2006	ISSN 0341–8391

Personopsis ednafarinasi, spec. nov., a new species of Personidae from the Philippines

(Mollusca)

Manfred Parth

Parth; M. (2006): *Personopsis ednafarinasi*, spec. nov., a new species of Personidae from the Philippines (Mollusca). – Spixiana **29/3:** 235-236

Personopsis ednafarinasi, spec. nov. from the Philippines is described and compared with *P. trigonaperta* Beu, 1998 and *P. purpurata* Beu 1998.

Manfred Parth, Erzgießereistr. 18c, D-80335 München

Personopsis ednafarinasi, spec. nov.

Fig. 1

Types. Holotype: Zoologische Staatssammlung Nr. ZSM MOL 20061608, dredged from deep water near Aliguay, Philippines. – Paratype: same locality.

Description

Measurements. Holotype: height: 51.53 mm, width: 26.25 mm. Paratype: height: 46.46 mm, width: 24.40 mm.

Shell largest of the genus and very elongate for the genus. Tall spire, almost half length of the total of the shell, whorls weakly distorted. Teleconch of 6 whorls with 7 long angulated varices, weaker on the spire whorls. Terminal varix well developed, remarkably angulated in adapical direction. Penultimate varix visible on ventral side. Sculpture of 7 to 8 prominent, primary spiral cords on the last whorl (passing onto terminal varix) with 7 more closely spaced cords on canal. Spire whorls showing 4 primary cords. Beween those prominent spiral cords secondary and tertiary cordlets visible. Fine axial costae over entire suface, but less prominent than spiral sculpture, over last whorl 20 axial riblets forming small nodules where they cross the spiral cords. Aperture more than half of total shell length. Outer lip with 7 to 8 strong and long denticles, first adapical denticle smallest, 3rd only slightly stronger than the others. Columella with about 5 strong denticles, uppermost basal columellar tooth distinctly most prominent. Parietal area smooth bearing a single prominent parietal ridge. Siphonal canal long and broad. Colour of the shell white.

Etymology. The new species is dedicated to Ms. Edna Fariñas.

Distribution. Philippines, only known from the two mentioned specimens and from the type locality.

Discussion

With some hesitation the new species is placed in the genus *Personopsis*. While the apertural features indicate rather placement in the genus *Distorsionella* (denticles of the outer lip more resembling *Distorsionella lewisi*, not bearing the obviously enlarged second or third tooth from the adapical end as it occurs in *Distorsio* s. str. and in *Personopsis*), the varical position more resembles those of typical *Personopsis* species as *P. trigonaperta* and *P. purpurata*. *Personopsis ednafarinas* differs from both *Personopsis trigonaperta* and *D. purpurata* by its much larger size. While *Personopsis purpurata* reaches 1.9 cm and *Peronopsis trigonaperta* 2.6 cm in heigth, the new species exceeds 5 cm in heigth.

Fig. 1. Ventral surface (above) and dorsal surface (below). **a**, *Personopsis ednafarinasi*, spec. nov. Holotype (height: 51.53 mm). **b**, *Personopsis ednafarinasi*, spec. nov. Paratype (height: 46.46 mm). **c**, *Personopsis purpurata* Beu (height: 32.87 mm, width: 17.39 mm), from near Aliguay, Philippines.

References

Beu, A. G. 1998. Indo-West Pacific Ranellidae, Bursidae and Personidae (Mollusca: Gastropoda). A Monograph of the New Caledonian fauna and revisions of related taxa. – Mem. Mus. nat. hist. nat. Paris **178**: 9-255

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Pycnogonids on cnidarians at fjord Comau, Southern Chile: A report on 2005 SCUBA collections*

Roland R. Melzer, Michael Schrödl, Verena Häussermann, Günter Försterra & Maria Fernanda Montoya Bravo

Melzer, R. R., M. Schrödl, V. Häussermann, G. Försterra & M. F. Montoya Bravo. (2006): Pycnogonids on cnidarians at fjord Comau, Southern Chile: A report on 2005 SCUBA collections. – Spixiana **29/3:** 237-242

Using SCUBA sampling on inner Comau fjord's cnidarian communities we found 65 specimens of subtidal pycnogonids belonging to four species of four different families: *Anoplodactylus californicus* Hall (Phoxichilidiidae), *Achelia assimilis* (Haswell) (Ammotheidae), *Callipallene margarita* (Gordon) (Callipallenidae) and *Austrodecus curtipes* Stock (Austrodecidae). Biogeography and ecology of these species are discussed with respect to the fjord's specific conditions.

R. R. Melzer (corresponding author: melzer@zsm.mwn.de), M. Schrödl, M. F. Montoya Bravo, Zoologische Staatssammlung München, Münchhausenstr. 21, D-81247 München, Germany.

V. Häussermann, G. Försterra, Huinay Scientific Field Station "San Ingacio del Huinay", Huinay, X[th] Region, Chile.

Introduction

In Southern Chilean fjords, like the nearly pristine Comau and Quintupeu fjord at 42.1-42.5°N and 72.4-72.6°W (fig. 1), one finds highly specific abiotic factors as well as impressive and unique benthos communities (Försterra & Häussermann 2003, Försterra et al. 2005). These fjords are strongly influenced by high precipitation, i.e. fresh water running down the mountains by numerous rivers, brooks and streams forming a low salinity layer that may attain a thickness of up to 7 m. Tides of an amplitude between 4 and 6 m expand the freshwater influenced upper benthos zone to a depth of more than 10 m. Hence, the phytal zone is not well developed. Below the halocline, however, one finds various types of flourishing benthos communities obviously dominated by sessile filtering organisms: large amounts of Actiniaria, Scleractinia and other cnidarians mixed with brachiopods cover the rocky slopes falling from shallow waters steeply into the depths of the fjord ("cold water reefs"; see, e.g., Försterra & Häussermann 2003). Among these coelenterate communities, hydrozoan and octocoral colonies form large meadows in moderate, SCUBA-accessible depths.

As a part of the studies on Comau fjord coordinated by the Huinay Scientific Field Station focussing on an inventory of the fjord's invertebrate fauna (Försterra & Häussermann 2003, Schrödl et al. 2005) we have used SCUBA sampling techniques to study the sublittoral Pycnogonida on cnidarian colonies at the steep rocky slopes, and give a survey of the collected species and further observations. The classical study on Southern Chilean pycnogonids is that of Hedgpeth (1961) using material collected by the Lund University Chile Expedition. In the latter study most of the material was sampled at the outer coast and within semi-protected "channels" of Chile rather than in the inner fjords, i.e. areas much less influenced by fresh water (see Brattström & Johanssen 1983 for a general survey of the communities studied by Lund's excursion). Thus far, Southern Chilean pycnogonids were mainly trawled from considerable depths, shallower subtidal areas have not been sampled systematically. Hence the report given here is intended to supplement previous

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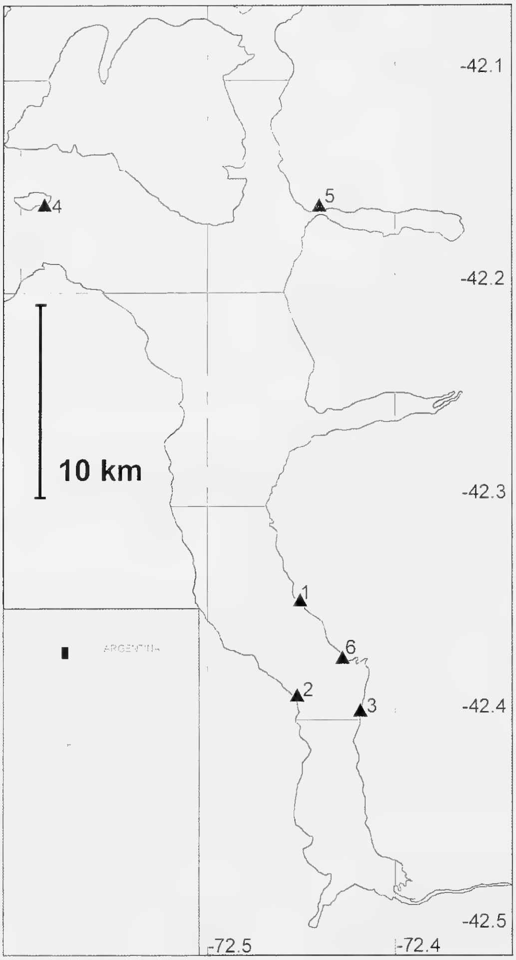


Fig. 1. Map of the Comau fjord showing the locations from which the material for this study was collected: **1** Playa Llonco, **2** Cross Huinay Nord, **3** Punta Gruesa, **4** Lilihuapi, **5** Quintupeu, **6** Punta Huinay.

knowledge on the pycnogonid fauna by investigating unstudied areas with special environmental conditions, and, for the first time, to enlighten the shallow subtidal down to 40m depth. A synopsis of Chilean pycnogonids and bibliography is given in Sielfeld (2003). Infralittoral pycnogonids are known to be either found in the phytal zone or on cnidarians, some of them are known to feed on these (Staples & Watson 1987, Arango, 2001, Genzano 2002, Heß & Melzer 2003).

Collecting stations and methods

During SCUBA dives between 0 and 40 m at the locations given below and on fig. 1, pycnogonids were either collected by hand or samples of coelenterate colonies were removed from the ground and examined in the laboratory. All the samples were taken from the benthos communities at the steep rocky slopes described above. For photographic documentation, a Canon Ixus 400 underwater camera, an Olympus 8080 and an Olympus stereomicroscope were used. The sample sites were: (1) Plaja Llonco, 10-30 m, 18.2.05; (2) Cross Huinay Nord, 10-39,5 m, 21.2.05; (3) Punta Gruesa, 20-33 m, 22.2.05; (4) Lilihuapi West, 20 m, 6.1.05, and 10-36 m, 24.2.05; (5) Quintupeu, 15-25 m, 25.2.05; (6) Punta Huinay, 18 m, 4.5.05. The collected material is deposited at the Bavarian State Collection of Zoology in Munich.

The collected Pycnogonida

Pycnogonids were absent in the upper brackish water zone. A total of 65 specimens belonging to 4 species, were found at the six subtidal sampling sites given above. They represent various locations from the outer sections of Comau fjord to the innermost part being more than 30 km away from the Corcovado Gulf (Fig. 1). All the collected pycnogonids were found on hydrozoans belonging to the Plumulariidae, Sertulariidae and Campanulariidae.

Phoxichilidiidae

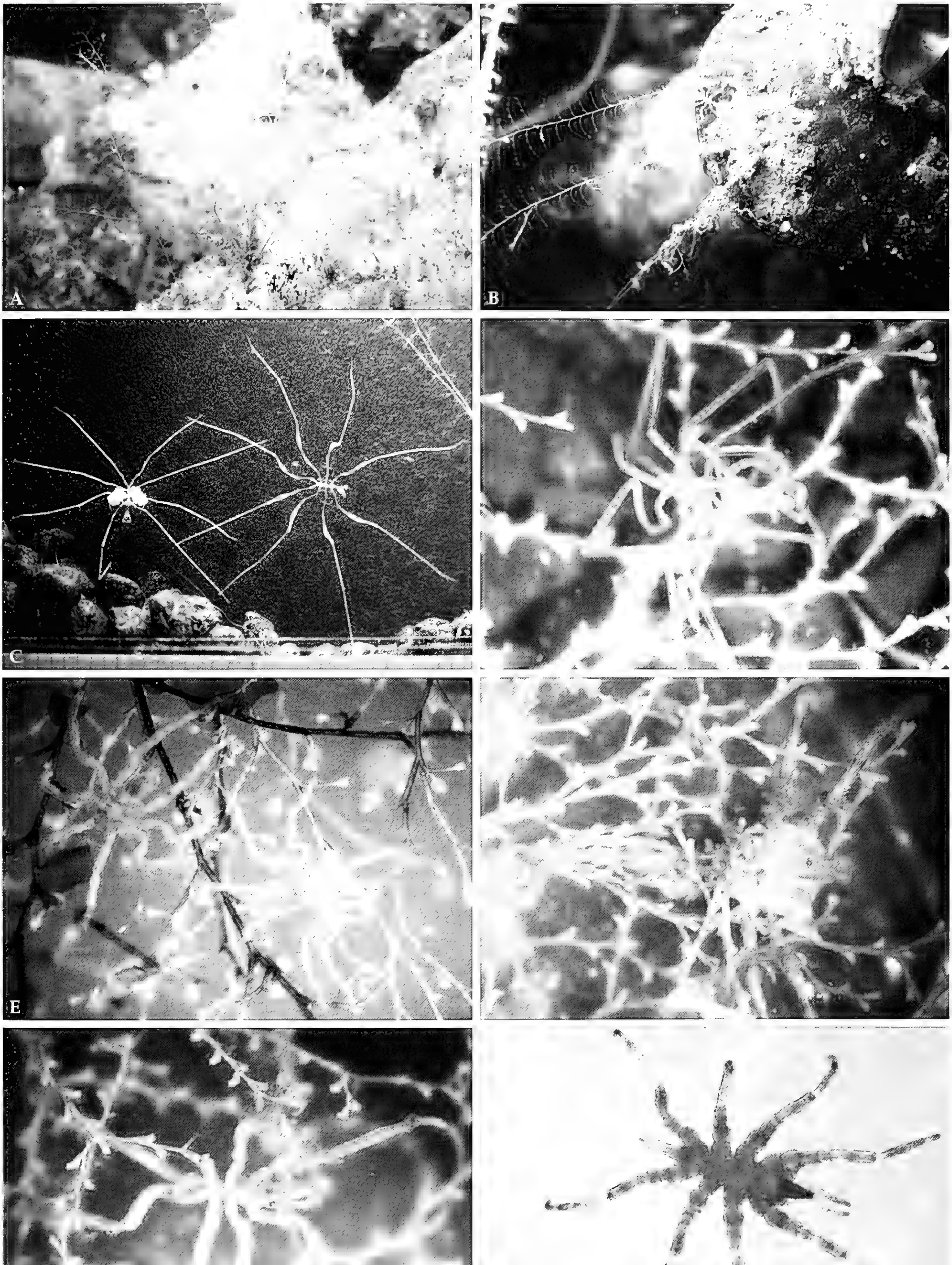
Anoplodactylus californicus Hall, 1912

Material. Lilihuapi West: 1♀; 6.1.05; A20051960 (Bavarian State Collection's storage number). Quintupeu: 1♀, 4♂♂; 25.2.05; A20051915-A20051919.

Remarks. At Hedgepeth's times, individuals from Chile were named *Anoplodactylus portus* Calman, 1927, and he described from the Lund specimens var. *chilensis* (see synonymy in Müller 1993). All the

▷

Fig. 2. Pycnogonids collected from hydrozoans at Comau fjord. **A.** *Callipallene margarita.* **B.** *Anoplodactylus californicus.* **C.** *Callipallene margarita.* **D.** *Callipallene margarita.* **E.** *Achelia assimilis.* **F.** *Anoplodactylus californicus.* **G.** *Anoplodactylus californicus.* **H.** *Austrodecus curtipes.* On **A** and **B**, plumulariid, on **D, F** and **G** sertulariid and on **E** and **H** campanulariid hydrozoans are seen on which the pycnogonids were found. **A-G** show vital animals, **H** is a specimen fixed in ethanol. **A** and **B** are underwater photographs shot at the actual habitat of the species, **C** is a macrophotograph taken from aquarium, and **D-H** are stereomicroscopic pictures.


A
B
C
E

Lund material comes from between 41°44'-41°50'S and 73°06'-73°31'W, i.e. from the outer coast North and West of Comau. The Huinay material (6 specimens) corresponds well with Hedgepeth's description (Figs 2B,F,G). The females possess the alate processes on the proboscis characteristic for this species. *A. californicus* was originally seen as an interdidal form restricted to California. Later reports, however, indicated at least a circumtropical distribution, and in the meantime, this species has been found even in the Mediterranean Sea (van der Land & Krapp 2001). Our report from Comau fjord is among the southernmost locations at which this species is found (see also Child 1992). The two individuals of *A. californicus* depicted here represent two extremes of coloring. Most animals in the Comau area are uncolored as shown in fig. 2G. Occasionally, however, animals with reddish stripes are found, possibly depending on food (Fig. 2F).

Ammotheidae

Achelia assimilis (Haswell, 1875)

Material. Cross Huinay Nord: 2♂♂, 14 juv.; 21.2.05; A20051928-A20051930, A 20051946-A20051957, A10051968.

Punta Gruesa: 1♂, 4 juv.; 22.2.05; A20051921, A20051922, A20051931-A20051933.

Lilihuapi West: 2♀, 4 juv.; 24.2.05; A20051923-A20051927, A10051970.

Quintupeu: 1♀, 1♂ with larvae on ovigera, 2♂♂, 16 juv., 1 3-limbed larva attached on hydrozoan colony; 19 individuals of the sample were found on a single hydrozoan "tree"; 25.2.05; A20051934-A20051945, A10051961-1966, A10051968, A10051971.

Punta Huinay: 1 juv.; 4.5.05; A20051920.

Remarks. *A. assimilis* (Fig. 2E) is a widely distributed form in tropical and temperate waters of the southwest Pacific which also occurs along the Pacific coast of South America. The Lund excursion found numerous individuals of this highly variable species from the tidal area to a depth of more than 250 m between 41-53° S and 70-73°W (Hedgpeth 1961). González & Edding (1990) found *A. assimilis* in the Coquimbo region, i.e. far in the north, at 30° S. Our samples (49 individuals, more than ⅔ of the whole sample) indicate that *A. assimilis* might be the most common pycnogonid at fjord Comau, were it is found regularly on coelenterate colonies. 40 individuals are juveniles of various size, 3 are females and 6 males (one of these carrying larvae). Hence, about ¼ of the population are in a fertile stage in February, i.e. Southern Chilean summer. Müller (1993) reports stones, dead corals and red algae as *A. assimilis*'s main habitat. In our Quintupeu sample 19 individuals of various stages from a single hydrozoan "tree" are found showing the high density in which *A. assimilis* may occur. Pycnogonid-hydrozoan associations for the coast of argentine are described in Genzano (2002).

Callipallenidae

Callipallene margarita (Gordon, 1932)

Material. Playa Llonco: 1♂; 18.2.05; A20051912.

Cross Huinay Nord: 1♀ with developed eggs in legs, 2♂♂; 21.2.05; A20051910, A20051911, A20051913.

Punta Huinay: 5♂♂; 4.5.05; A20051914, A20051909.

Remarks. Most reports of *Callipallene margarita* are from the shelf and slope of the Atlantic coast of south America, mainly Argentina, but also Brazil and the South Georgia area (Müller 1993). Hedgpeth's (1961) report from the Chilean coast was the first from the Pacific Ocean; only a single female was found at a depth of 70 m at 42°20'50"S, 73°22'00"W. Our 9 specimens correspond well with the description of the Lund material and indicate that *C. margarita* is not as rare as Hedgpeth's (1963) report might suggest (fig. 2A,C,D). Contrary to earlier collections, in which this species was generally found between 100 and more than 2000 m of depth (Müller 1993), we found *C. margarita* in the upper sublitoral between 10 and 40 m.

Austrodecidae

Austrodecus curtipes Stock, 1957

Material. Punta Gruesa: 1♀; 22.2.05; A20051959.

Lilihuapi West: 1♀; 24.2.05; A20051958.

Remarks. Hedgepeth (1961) had some individuals from 53°11'S 70°55'W, i.e. the Strait of Magellan south of Punta Arenas, found "between the tides". In his original description Stock (1957) studied material from the Falklands, Kerguelen and Tierra del Fuego. Hence, the Huinay material at present is the northernmost record of this pycnogonid and the first one truly in the Pacific Ocean. Our specimens show the *A. curtipes* features as described in Stock (1957) exept for the armature of coxa 1 of leg 1: here our specimens have 2 dorsal spurs (see discussion on variability and distinctive features to *A. longispinum* in Stock (1957)). In fjord Comau, we found *A. curtipes* together with *Achelia assimilis* on hydrozoan colonies (fig. 2H) on rocks. In contrast, Müller (1993) mentions *Macrocystis pyrifera* as the main habitat of this pycnogonid.

Conclusions

The pycnogonid fauna presently known from the inner part of Comau fjord is composed of some of the species also found at the outer coast and channels that were studied by the Lund excursion southwards to the Magellan Strait (Hedgpeth 1961). Obviously the observed species are able to tolerate the specific fjord conditions. Our collection sites are at lower depth than those of most previous studies on the respective species (see above). It is not clear at the moment if our new findings are due to the newly applied sampling technique (SCUBA) in a so far unstudied area and depth range, respectively, or if the occurrence of otherwise deep-water pycnogonids in low depths is limited to the inner fjords. The latter may support a more general observation that in the inner fjords deep water forms occur already at moderate depths, as shown in Försterra & Häussermann (2003) for scleractinians.

Three of the species deserve peculiar attention: First we show that *Callipallene margarita* is far from being a rare fjord pycnogonid. Second, is the occurrence of *Anoplodactylus californicus* deep in the South, far away from its circumtropical and/or subtropical main area, and third, our *Austrodecus curtipes* individuals found in Comau fjord extend the known distributional range of this species from the subantarctic Atlantic and Magellan Strait (Stock 1957, Hedgpeth 1961) considerably north into the Pacific Ocean. Thus, *A. curtipes* might be a "pycnogonid example" for a wideranged Magellanic species extending north by virtue of similar environmental conditions created by the Humboldt current, as has been described for several marine invertebrate taxa, e.g. in Brattström & Johanssen (1983) and in Schrödl (2003).

The cnidarian "meadows" at a depth of between 10 and 40 m are the main pycnogonid habitat found in Comau fjord so far. As various pycnogonids are known to feed on cnidarians these meadows mainly made of hydrozoans are similar to pycnogonid habitats found in other seas, and correspond well to pycnogonid-hydrozoan associations described for the Atlantic coast of Argentine by Genzano (2002; see also Staples & Watson 1987, Arango 2001). However, the upper phytal layer, generally providing a second main pycnogonid habitat, seems to be less inhabited by them at Comau fjord. This might be related to the brackish water layer allowing only a relatively poor macroalgal zone composed of some *Macrocystis* spots.

Acknowledgements

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Literature

Arango, C. P. 2001. Sea spiders (Pycnogonida) from the Great Barrier Reef, Australia, feed on fire corals and zoanthids. – Mem. Queensland Mus. **46**: 656

Brattström, H. & A. Johanssen 1983. Ecological and regional zoogeography of the marine benthic fauna of Chile. Report no. 49 of the Lund University Chile Expedition 1948-1949. – Sarsia **68**: 289-339

Child, A. C. 1992. Pycnogonida of the Southeast Pacific Biological Oceanographic Project (SEPBOP). – Smithson. Contr. Zool. **526**:1-43

Försterra, G., L. Beuck, V. Häussermann & A. Freiwald 2005. Shallow water *Desmophyllum dianthus* (Scleractinia) from Chile: characteristics of the biocenoses, the bioeroding community, heterotrophic interactions and (palaeo)-bathymetrical implications. – In: Freiwald, A. & J. M. Roberts (eds.): Cold-water corals and ecosystems. – Springer-Verlag Berlin Heidelberg, pp. 937-977

– – & V. Häussermann 2003. First report on large scleractinian (Cnidaria: Anthozoa) accumulations in cold-temperate shallow water of south Chilean fjords. – Zool. Verh. (Leiden) **345**: 117-128

Genzano, G. N. 2002. Associations between pycnogonids and hydroids from the Buenos Aires littoral zone, with observations on the semi-parasitic life cycle of *Tanystylum orbiculare* (Ammotheidae). – Scientia Marina **66**: 81-92

Gonzales, S. A. & M. E. Edding 1990. *Achelia assimilis* (Haswell, 1884) in the Heterozostera bed of Puerto Aldea, Coquimbo: First record from the Northern Chilean coast (Pycnogonida: Ammotheidae). – Proc. Biol. Soc. Washington **103**: 151-156

Hedgpeth, J. W. 1961. Reports of the Lund University Chile Expedition 1948-49, 40: Pycnogonida. – Lunds Univ. Arsskr. NF, Avd 2, Bd **57**: 1-18

Heß, M. & R. R. Melzer 2003. *Anoplodactylus petiolatus* (Pycnogonida) and *Hydractinia echinata* (Hydrozoa) – observations on galls, feeding behaviour and the host's defence. – Vie et Milieu **53**: 135-138

Müller, H.-G. 1993. World catalogue and bibliography of the recent Pycnogonida. – Verlag H.-G. Müller, Wetzlar, 388 pp.

Staples, D. A. & J. E. Watson 1987. Associations between pycnogonids and hydroids. – In: Bouillon, J., F. Boero, F. Cicogna & P. F. S. Cornelius (eds.): Modern trends in the Systematics, Ecology and Evolution of Hydroids and Hydromedusae. – Oxford University Press, pp. 215-226

Sielfeld, W. 2003. Clase Pycnogonida. Guias de Identificación y Biodiversidad Fauna Chilena. – Apunt. Zool., Univ. Arturo Prat, Iquique, Chile, 7 pp.

Schrödl, M. 2003. Sea slugs of Southern South America. – Conch Books, Hackenheim, 165 pp.

– – , M. A. Alarcón, L. R. Bedrinana, F. J. Bravo, C. M. Bustamante, R. Carvalho, G. Försterra, C. Gallardo, V. Häussermann & A. Salmen 2005. Nudipleura (Gastropoda: Opisthobranchia) from the southern Chilean Comau Fjord, with redescription of *Polycera priva* Marcus, 1959. – Vita Malacologica: **3**: 23-33

Stock, J. H. 1957. The pycnogonid family Austrodecidae. – Beaufortia 6, No. **68**: 1-81

Van der Land, J. & F. Krapp 2001. Pycnogonida. – p. 241-243 in: Costello, M. J., C. S. Emblow & R. White (eds.): European register of marine species. A check list of the marine species in Europe and a bibliography of guides to their identification. – Patrimoines naturels **50**, 463p.

SPIXIANA	**29**	3	243–246	München, 01. November 2006	ISSN 0341-8391

A peculiar new species of the genus *Amblytelus* Erichson from southern Queensland, Australia

(Insecta, Coleoptera, Carabidae, Psydrinae)

Martin Baehr

Baehr, M. (2006): A peculiar new species of the genus *Amblytelus* Erichson from southern Queensland, Australia (Insecta, Coleoptera, Carabidae, Psydrinae). – Spixiana **29/3:** 243-246

Amblytelus fallax, spec. nov. is described from south-eastern Queensland, Australia. It differs from all known species of the genus *Amblytelus* by absence of the tactile seta in the mandibular scrobe and, at the same time, by extra setae on head and pronotum and by the exceptional large number of setae on disk and at the lateral margins of the elytra, and also at the apical margin of the terminal abdominal sternite in the female.

Dr. Martin Baehr, Zoologische Staatssammlung, Münchhausenstr. 21, D-81247 München, Germany; e-mail: martin.baehr@zsm.mwn.de

Introduction

Soon after print of the revision of the amblyteline Psydrinae (Baehr 2005) in a determination shipment I received a number of specimens of the common Australian species *Amblytelus brevis* Blackburn. Within this sample, a single female specimen was outstanding, at the first glance, by the large number of elytral setae and also by slight differences in body shape and elytral pattern. More detailed examination revealed some surprising special characters that distinguish this specimen from all known amblyteline species. Because the single specimen not only differs in its chetotaxy, but also deviates in certain other characters from the most similar *A. brevis*, it is described as a new species herein.

Style and format of the description exactly corresponds to that in my revision (Baehr 2005) which also can be used to gain additional information about the genus *Amblytelus* Erichson, its morphology, distribution, and habits.

Amblytelus fallax, spec. nov.

Figs 1-3

Types. Holotype: ♀, AUSTRALIA Peregian, 20 mi N. Maroochydore, Qld. 11.iii.1975 H. & A. Howden/*Banksia* flowers (Agriculture Canada, Ottawa).

Diagnosis. Immediately distinguished from all known species of the genus *Amblytelus* by absence of the tactile seta in the mandibular scrobe, and by presence of extra surpaocular, anterior pronotal, scutellar, discal and marginal elytral, and apical abdominal setae. In shape and colouration very similar to *A. brevis* Blackburn, but with larger eyes, more angulate basal angles of the pronotum, and more faded dark sutural stripe.

Description

Measurements. Length: 9.5 mm; width: 4.1 mm. Ratios. Length eye/orbit: 4.0; width/length of pronotum: 1.51; width base/apex of pronotum: 1.22; width pronotum/head: 1.34; length/width of elytra: 1.50; width elytra/pronotum: 1.64.

Colour (Fig. 1). Fore body light reddish, light discal stripes and lateral margin of elytra, mouth parts, antennae and legs pale reddish to yellowish,

Fig. 1. *Amblytelus fallax*, spec. nov., holotype. Habitus and colour pattern. Length: 9.5 mm.

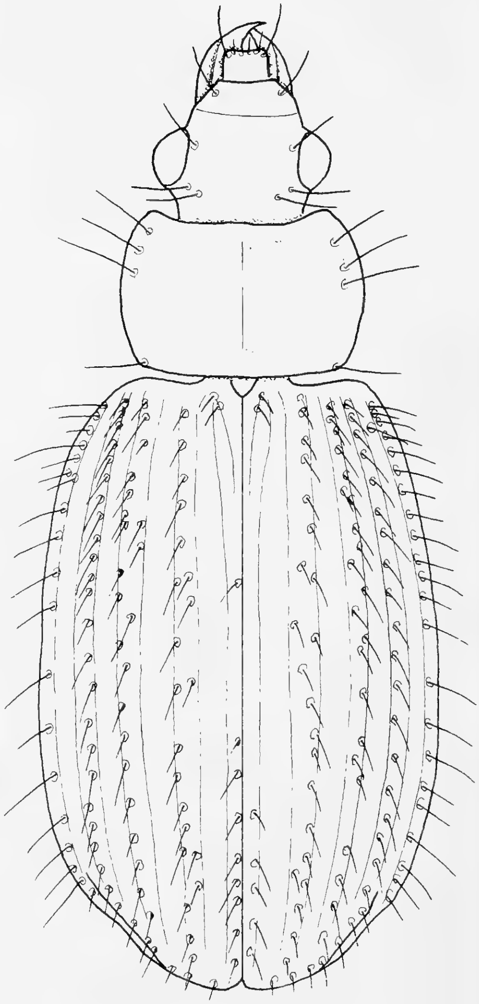

Fig. 2. *Amblytelus fallax*, spec. nov. Arrangement of chetotaxy. Length: 9.5 mm.

dark lateral stripes of elytra piceous to almost black, the sutural stripe reddish. Suture of elytra including 2nd interval dark, dark lateral stripes occupying the lateral two thirds of 6th interval and the whole 7th interval, margin light from 8th interval onwards. Sutural stripe not reaching base, gradually fading towards base. The light discal stripes ending at a short distance from apex, apex of elytra completely reddish, because the black lateral stripes are also abbreviated near apex and are fading into reddish.

Chetotaxy (Fig. 2; different from the revision, chetotaxy is not abbreviated due to the many differences from all other species).

Head: labial: 6; clypeal (either side): 1; mandibular: 0; mental: 2; submental (either side): 1 and 2; anterior supraorbital (either side): 1; posterior supraorbital (either side): 2.

Pronotum (either side): anterior pronotal: 3; posterior pronotal: 1.

Elytra: scutellar (either side): 2; 1st interval: 5-8; 3rd interval: 18-19; 5th interval: 22-23; 7th interval: 23-25; marginal: 19-21; apical: 4-5.

Abdomen (either side): female terminal: 4-5; male terminal: unknown.

Head. Rather wide, depressed, about one fourth narrower than pronotum. Eyes very large, laterally markedly protruded, orbits short, very oblique, very slightly convex, evenly merging into curvature of eye. Labrum anteriorly slightly concave. Mandibles moderately elongate, different to all other species of

Amblytelini scrobe without any trace of mandibular pore and seta. Tooth of mentum large, wide, apically convex. Glossa transverse at apex, bisetose, paraglossae hyaline, barely surpassing glossa. Lacinia with few very strong spines. Both palpi obliquely cut at apex, sparsely and very finely pilose. Antenna elongate, surpassing base of pronotum by c. 3 antennomeres. Median antennomeres c. 3× as long as wide. Posterior supraorbital setae slightly removed from eye, situated at posterior margin of eye. Frontal furrows shallow, about circular. Surface absolutely smooth, without any punctuation and microreticulation, very glossy.

Pronotum. Wide, somewhat cordiform, dorsally rather convex. Apex moderately concave, apical angles very widely rounded, slightly protruded. Lateral margin convex throughout, basal angles distinct though obtuse, forming an angle of about 110°. Base slightly convex, but laterally barely excised. Apex in middle not margined, base finely margined. Marginal channel moderately deep, lateral margins wide, widened towards base, slightly explanate and upturned. Median line distinct, neither reaching apex nor margin, both anterior and posterior transversal sulci very shallow. Basal grooves about circular, barely separated from marginal channel. The three anterior lateral seta inserted in anterior half, situated in marginal channel far removed from margin. The posterior lateral seta arising at lateral margin very slightly in front of basal angle. Surface absolutely smooth, without punctuation and microreticulation, very glossy.

Elytra. Moderately elongate, moderately convex, distinctly widened posteriorly, widest at apical third. Humeri widely rounded, lateral margin gently convex, in middle almost straight, at apex convex though with slight excision where the apical epipleural fold meets the margin. Apex of either elytron gently angulate, hence elytra slightly dehiscent at suture. Lateral apical fold very strong. All striae complete, rather deep, at bottom finely crenulate, intervals depressed. Scutellar pore and seta doubled, all odd intervals, including the first, with remarkably numerous setiferous punctures (s. chetotaxy), marginal channel also unusually multisetose, series very slightly interrupted behind middle. Intervals finely and rather sparsely punctulate, distinctly though very finely and rather superficially microreticulate, meshes about isodiametric to slightly transverse. Surface rather glossy.

Posterior wings. Fully developed.

Lower surface. Metepisternum very elongate, c. 3× as long as wide at apex. Abdominal sterna unisetose on either side, terminal sternum s. chetotaxy.

Legs. Of average size.

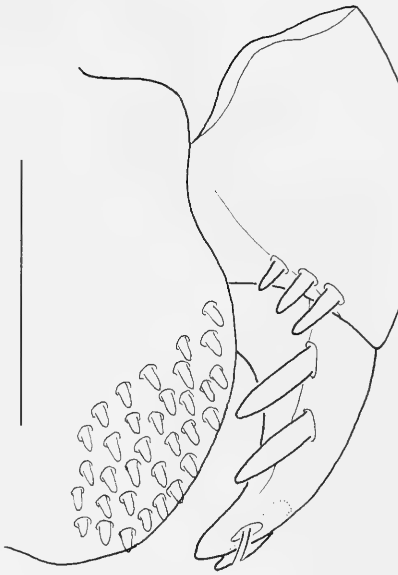

Fig. 3. *Amblytelus fallax*, spec. nov. Female stylomeres 1 and 2. Scale: 0.2 mm.

♂ genitalia. Unknown.

♀ genitalia (Fig. 3). Female stylomere 2 fairly elongate, regularly curved, with 2 large latero-ventral ensiform setae, a large medio-dorsal ensiform seta situated at apical third, and two short, attached nematiform setae originating from a groove near apex. Stylomere 1 rather elongate, longer than wide, with 3 short ensiform setae of slightly decreasing size situated on latero-ventral rim. Lateral plate ventro-medially with a field of densely packed, very short, knob-shaped ensiform setae.

Variation. Unknown.

Distribution. South-eastern Queensland, Australia. Known only from type locality.

Collecting circumstances. Collected on "*Banksia* flowers".

Etymology. Latin "*fallax*" means "fraudulent" and refers to the mocking number of setae on almost all body parts that usually bear tactile setae.

Remarks

It is surprising why this peculiar species has been so far collected in a single specimen only and was not represented in the thousands of specimens of bilineate *Amblytelus* from south-eastern Australia that I have examined in the course of the revision of this genus. The exceptional chetotaxy of the single available specimen of the new species, in combination with the likewise unusual collecting circumstances renders this a quite enigmatic species, and thus it may be allowed to speculate about presumably aberrant habits. Normally, in south-eastern Australia, species of the genus *Amblytelus*, but also amblytelines in general, are found either under bark of bark-shedding eucalypts in open sclerophyll forest or woodland, or on mossy tree trunks in temperate and subtropical rain forest. Reports of amblyteline specimens collected on flowering plants are so far unknown to me. However, at present and with a single specimen only, it seems superfluous to speculate whether this may be the regular habits of this species. But the remarkably multiplied number of tactile setae on the whole body and, on the other hand, the loss of the mandibular seta that is present in all other amblyteline species, must be of some ecological significance. Future collectors of amblytelines thus are advised to pay special attention to this habitat.

Even when the new species lacks the mandibular seta which absence is unique within Amblytelini in general, I guess that it may be yet rather closely related to the *curtus-brevis-sinuatus*-assemblage of rather large, quite similarly shaped and patterned species that bear bilineate elytra with multisetose odd intervals, and which are common in open forests of south-eastern and south-western Australia (for more information see Baehr 2005). Unfortunately, the male genitalia of *A. fallax* which could either corroborate or refuse this assumption are still unknown.

Acknowledgements

I am indebted to P. Bouchard, Ottawa, for the kind loan of this and a great number of other Australian specimens.

References

Baehr, M. 2005. The Amblytelini. A tribe of corticolous ground beetles from Australia. Taxonomy, phylogeny, biogeography (Insecta, Coleoptera, Carabidae, Psydrinae). – Coleoptera **8**: 1-286 (2004)

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The Sterrhinae moth fauna of Fenglin Nature Reserve, North-East China

(Insecta, Lepidoptera, Geometridae)

Pasi Sihvonen

Sihvonen, P. (2006): The Sterrhinae moth fauna of Fenglin Nature Reserve, North-East China (Insecta, Lepidoptera, Geometridae). – Spixiana **29/3:** 247-257

The Sterrhinae moth fauna (Lepidoptera, Geometridae) of the Fenglin Nature Reserve – a Biosphere Reserve of UNESCO's Man and the Biosphere Programme – in North-East China was studied in the summer of 2000. Altogether 25 species and 340 specimens were observed. The following 10 species are reported for the first time from China: *Idaea terpnaria* (Prout), *Idaea aversata* (Linnaeus), *Idaea effusaria* (Christoph), *Idaea pallidata* (D. & S.), *Cyclophora albipunctata* ssp. *griseolata* (Staudinger), *Problepsis plagiata* (Butler), *Problepsis phoebearia* Erschov, *Scopula nemoraria* (Hübner), *Scopula tenuisocius* Inoue and *Scopula asthena* Inoue. Adults of these are illustrated. Additionally, adults and genitalia of two species-pairs are illustrated and diagnosed that may prove difficult to be identified, i.e. *Scopula floslactata* (Haworth) – *S. tenuisocius* Inoue and *Scopula subpunctaria* (Herrich-Schäffer) – *S. prouti* Djakonov. Over 60 % of the observed Sterrhinae species were noticed to have a distribution area that is restricted to the eastern Palaearctic area.

Dr. Pasi Sihvonen, Finnish Museum of Natural History, Department of Entomology, P.O. Box 17 (Pohjoinen Rautatiekatu 13), FI-00014 University of Helsinki, Finland; e-mail: pasi.sihvonen@helsinki.fi

Introduction

The Geometridae moth fauna of Korea is relatively well-known (Shin 1996) as is the fauna of the Russian Far East, the Primorye territory and the Amur region (e.g. Viidalepp 1975, 1996). However, the Geometridae fauna of the adjoining areas on the Chinese side of the border, the Mantschuria, are virtually uninvestigated. In addition, a lack of national checklists, databases or identification guides [except for subfamily Larentiinae (Xue & Zhu 1999)] made it difficult to produce this kind of data for basic research as well as for applied studies such as nature conservation.

Moths of the geometrid subfamily Sterrhinae are often rather inconspicuous, relatively small with a wingspan normally between 20-30 mm, night-active and in many cases difficult to identify. They are often gray or brown in colour, but a few pink or bright yellow species are known, especially in the tropics. The species prefer to inhabit open or semi-open areas and of the known world diversity (approximately 2800 species) most are known from the tropics. Caterpillars often feed on low plants and on dry litter. As a result of the things mentioned above, the Sterrhinae are easily overlooked in basic faunal surveys.

There is one previous study on the lepidopteran fauna of the Fenglin Nature Reserve (Wang 1982). In that study, 15 Geometridae species were reported, two of which were Sterrhinae: *Problepsis superans* Butler and *Scopula (Somatina) indicataria* Walker.

In this paper I present the results of two Finnish expeditions, which in part studied the Sterrhinae moth fauna (Lepidoptera: Geometridae) of the Fenglin Nature Reserve, located at NE-China.

The project, study area and methods

The decision to study Sterrhinae moths at the Fenglin Nature Reserve resulted from the fact that there is an ongoing cooperation project 'Biodiversity in boreal forests' between the Division of Population Ecology at the University of Helsinki (FIBRE), the Division of Entomology at the Finnish Museum of Natural History, the Chinese Forestry Academy and The State Natural Reserve Management Bureau of Fenglin. These moths are studied extensively at the Finnish Museum of Natural History under the program "Diversity and systematics of Scopulini moths".

The Fenglin Nature Reserve is situated in a hemiboreal vegetation zone with mixed forests in the Heilongjiang district, NE-China (48°01' to 48°09'N; 128°39' to 129°15'E). It is the last virgin forest in the area, mainly covered by Korean pine *(Pinus koraiensis)* with a size of 18000 hectares. Other trees include for example *Quercus mongolica, Acer mono, Tilia amurensis, Corylus manchurica* and *Abies nephrolepis*. The nature reserve is located at the Lesser Xingan Mountains and the altitude varies from 300 meters to over 700 meters above sea level.

In 1997 the Fenglin Nature Reserve was designated a Biosphere Reserve status and it is nowadays part of the World Network under UNESCO's Programme on Man and the Biosphere (MAB). As such its objectives are to promote solutions to reconcile the conservation of biodiversity with its sustainable use.

The moth fauna was studied during two separate expeditions: 2.-12.6.2000 (Jaakko Kullberg) and 28.6.-10.7.2000 (Pasi Sihvonen). Specimens were collected with generator powered lights and automatic light traps (model Jalas 160W light, 2×20W UV-light), Malaise traps and netting. Emphasis was placed on net collecting at dusk and at dawn when many species are active.

The majority of the specimens are deposited at the Finnish Museum of Natural History (Helsinki), and a few specimens are deposited at Institute of Zoology, Academia Sinica, (Beijing). Species were initially identified from the external characters, but in many cases the genitalia were prepared following the general procedures (Hardwick 1950).

The analysis of the distribution areas is based on literature records and museum collections of the Finnish

Tab. 1. Known distribution areas of the Sterrhinae moths found from the Fenglin Nature Reserve, North-East China, in 2000. First records from China are marked with an asterisk. 1 = Amur region and surrounding areas (Primorye, Sakhalin, Corea, Japan), 2 = trans-Palaearctic, a separate subspecies in Amur region and surrounding areas, 3 = Amur region, 4 = Japan, Korea, South Kuriles, 5 = trans-Palaearctic, mainly southern, 6 = Palaearctic, central and eastern.

	Species	Known distribution					
	Idaea muricata ssp. *minor* (Sterneck)		2				
	Idaea biselata ssp. *extincta* (Staudinger)		2				
	Idaea auricruda (Butler)	1					
*	*Idaea pallidata* ([Denis & Schiffermüller])					5	
*	*Idaea effusaria* (Christoph)	1					
	Idaea nitidata (Herrich-Schäffer)					5	
	Idaea promiscuaria (Leech)	1					
*	*Idaea aversata* (Linnaeus)					5	
*	*Idaea terpnaria* (Prout)	1					
*	*Scopula nemoraria* (Hübner)					5	
	Scopula modicaria (Leech)	1					
	Scopula umbelaria ssp. *graeseri* Prout		2				
	Scopula nigropunctata ssp. *subcandidata* (Walker)		2				
	Scopula prouti Djakonov	1					
*	*Scopula tenuisocius* Inoue	1					
	Scopula floslactata (Prout)					5	
	Scopula pudicaria (Motschulsky)	1					
*	*Scopula asthena* Inoue	1					
	Scopula subpunctaria (Herrich-Schäffer)					5	
	Scopula indicataria ssp. *sufflava* Prout	1					
*	*Problepsis phoebearia* Erschov			3			
*	*Problepsis plagiata* (Butler)				4		
*	*Cyclophora albipunctata* ssp. *griseolata* (Staudinger)		2				
	Timandra recompta ssp. *recompta* (Prout)						6
	Timandra comptaria (Walker)	1					
	Total	11	5	1	1	6	1
	Percentage	44	20	4	4	24	4

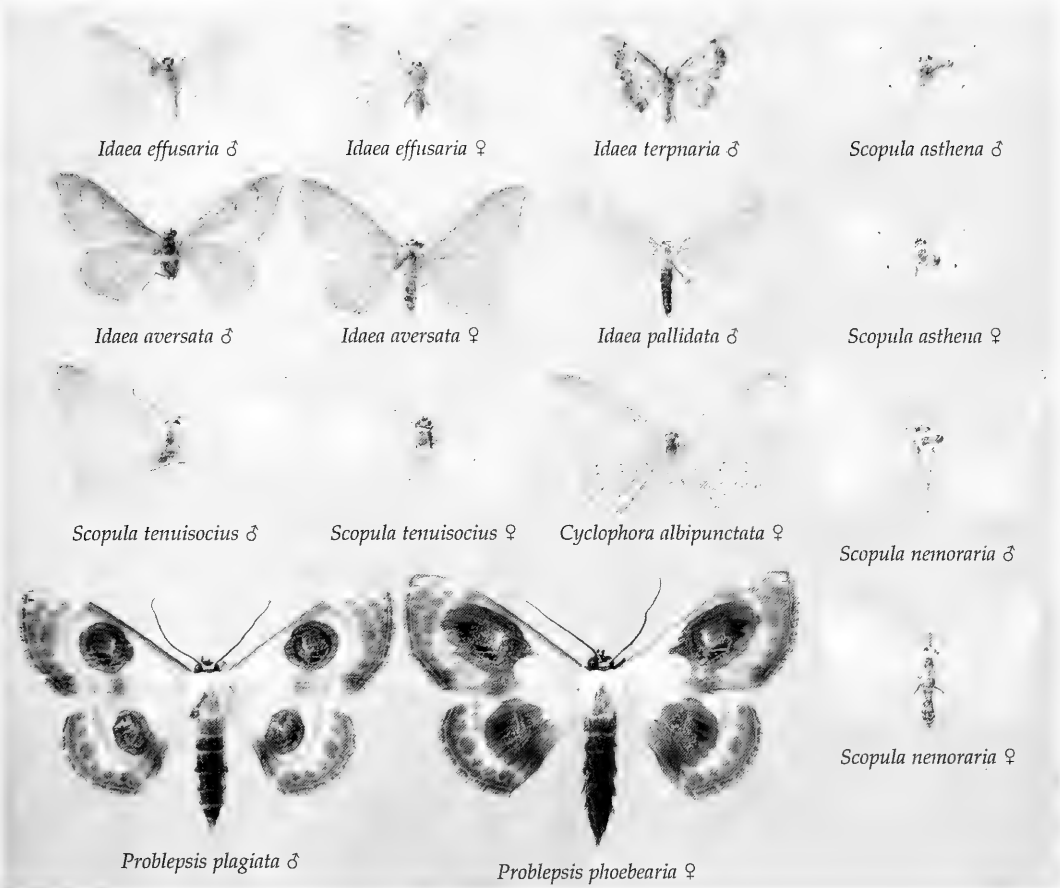


Fig. 1. Sterrhinae species, which are recorded for the first time from China. Specimens were collected from the Heilongjiang district, Fenglin Nature Reserve, 48°05'N 129°85'E, c. 200-500 m above sea level, between 2.-12.6.2000 and 28.6.-10.7.2000.

Museum of Natural History, Helsinki (ZMH), the Institute of Zoology, Academia Sinica, Beijing (IZAS) and The Natural History Museum, London (BMNH). Literature records include monographs and checklists (Ebert et al. 2001, Fajcik & Slamka 1996, Inoue 1977, Inoue et al. 1982a,b, Müller 1996, Shin 1996, Viidalepp 1996, Wang 1997, Hausmann 2004) as well as faunistic notes (Viidalepp 1975, Vojnits 1977).

List of species

Altogether 25 species and 340 specimens were observed. 10 species (40 % of all species) were recorded for the first time from China (Tab. 1). Species that are recorded for the first time from China are marked with an asterisk.

Idaea muricata ssp. *minor* (Sterneck, 1927)

2♂♂. N China – Mongolia, Korea, Japan, SE Russia (Inoue 1977, Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996).

The western Palaearctic nominate subspecies inhabits open moors in the northern areas of its distribution (Mikkola et al. 1985), whereas in the more southern areas it is found on a variety of habitats from wet meadows to moors, gardens and forest edges (Ebert et al. 2001). The Fenglin specimens were caught with a Malaise trap from a closed deciduous forest.

Idaea biselata ssp. *extincta* (Staudinger, 1897)

13♂♂, 2♀♀. N China – Korea, Japan, SE Russia (Inoue 1977, Inoue et al. 1982a,b, Viidalepp 1996).

Nominate subspecies from Europe to Mongolia in the Palaearctic region.

Figs 2, 3. Diagnostic adult characters (indicated) of Chinese *Scopula* species. **2.** *S. floslactata* (Haworth). **3.** *S. tenuisocius* Inoue (abdomen removed).

Idaea auricruda (Butler, 1879)

1♂. NE China – Korea, Japan, SE Russia (Inoue et al. 1982ab, Shin 1996, Viidalepp 1996).

**Idaea pallidata* ([Denis & Schiffermüller], 1775)

1♂. (Fig. 1). NE China – from N and C Europe to SE Russia.

Forewing fasciae are straight, ground colour is light yellow-brown in males, white in females. In western parts of its distribution area it may be confused with *I. subsericeata* (Haworth) (for identification see Ebert et al. 2001, Hausmann 2004). Also *I. nitidata* is similar but males of *I. pallidata* can be separated by the absence of hair-pencil on the hind tibia. The larva feeds on dry leaves of *Taraxacum*, *Hieracium* and *Achillea* (Ebert et al. 2001).

**Idaea effusaria* (Christoph, 1881)

27♂♂, 15♀♀ (Fig. 1). NE China – Korea, Japan, SE Russia (Inoue 1977, Shin 1996, Viidalepp 1996).

Sugi et al. (1987) illustrate the caterpillar of *I. effusaria*.

Idaea nitidata (Herrich-Schäffer, 1861)

26♂♂, 8♀♀. N China – from S Europe to Korea and Japan (Shin 1996, Viidalepp 1996, Inoue et al. 1982a,b). See *I. pallidata*.

Idaea promiscuaria (Leech, 1897)

34♂♂, 7♀♀. N China – Korea, Japan, SE Russia (Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996).

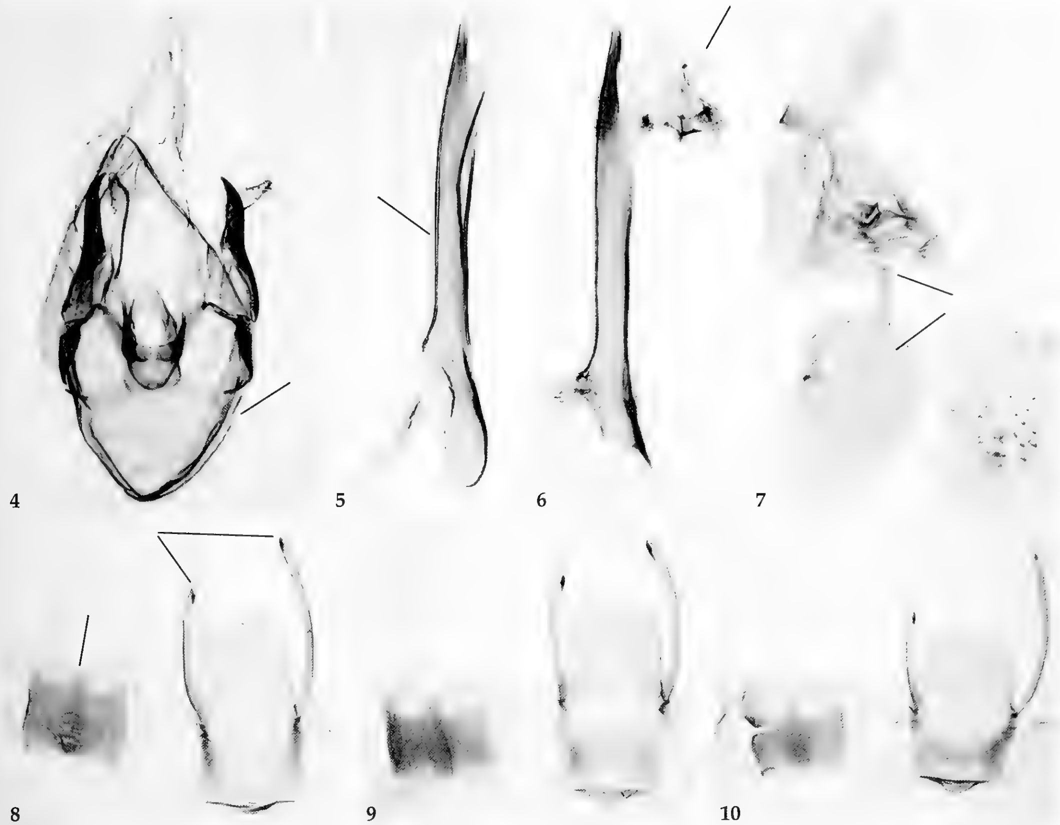
**Idaea aversata* (Linnaeus, 1758)

26♂♂, 8♀♀ (Figs 1, 30-32). NE China – Europe, Russia, Japan (Viidalepp 1996).

The external appearance of the Chinese *I. aversata* resembles Japanese populations, described as ssp. *japonica* (Inoue, 1955) (Inoue et al. 1982b). The Chinese specimens are reddish-brown and heavily suffused with black scales. The terminal line is distinct and the black dots at vein ends are obscure. Both male and female genitalia (Figs 30-32) match well with European specimens (Skou 1984, Hausmann 2004). The cucullus of the valva of the male genitalia bears a few sclerotized spines, the gnathos is heavily serrated with spines, the aedeagus is short, straight, with about 8 cornuti (Figs 30-31). The ductus bursae of the female genitalia is strongly spinose for about ⅓ of its length, it turns to the left along its axis and the ductus seminalis is bare (Fig. 32).

**Idaea terpnaria* (Prout, 1913)

2♂♂ (Fig. 1). NE China – SE Russia, Japan (Viidalepp 1996, Inoue et al. 1982a,b).



Figs 4-10. Diagnostic genitalia characters (indicated) of *Scopula floslactata* (Haworth). **4.** ♂ genitalia (PS653). **5.** ♂ aedeagus (PS653). **6.** ♂ aedegus, vesica everted (PS865). **7.** ♀ genitalia and signum (PS662). **8-10.** ♂ 8th segment of abdomen (PS669, PS670, PS653). Compare with closely related species *S. tenuisocius* (Figs 11-17).

**Scopula nemoraria* (Hübner, [1799])

11♂♂, 13♀♀ (Fig. 1). NE China – Palaearctic: S Europe to SE Russia (Viidalepp 1996).

The species is often found in deciduous forests. Possible foodplants include *Impatiens noli-tangere*, *Hypericum* spp. and grasses (Ebert et al. 2001).

Scopula modicaria (Leech, 1897)

2♂♂. NE and E China – Russia: Primorye; Japan, Korea (Inoue et al. 1982, Shin 1996, Viidalepp 1996).

Scopula umbelaria ssp. *graeseri* Prout, 1935

5♂♂, 2♀♀. NE China – Mongolia, Korea, Japan, SE Russia. Nominal subspecies from S Europe to NW China (Inoue et al. 1982, Viidalepp 1996).

Ebert et al. (2001) give *Vincetoxicum hirundinaria* as a possible food-plant of the larvae.

Scopula nigropunctata ssp. *subcandidata* (Walker, [1863])

4♂♂. N, NE and E China – Korea, SE Russia, Mongolia. Nominal subspecies from Europe to Russia: Urals and Iran. Separate subspecies in Japan and Korea (Viidalepp 1996, Inoue 1977, Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996, Scoble 1999).

**Scopula tenuisocius* Inoue, 1942

16♂♂, 4♀♀ (Figs 1, 3, 11-17). NE China – SE Russia, S Kuriles, Japan (Inoue et al. 1982a,b, Viidalepp 1996).

Similar to *S. duplinupta* Inoue, 1982, but the latter is currently known from Japan only (Inoue 1982b), and also to *S. floslactata* (Haworth), from which it can be separated as follows.

The wings of *S. tenuisocius* are sparsely serrated with black scales, especially in the forewing costa (more heavily serrated with black scales in *S. floslactata*) (Figs 2, 3). The terminal line is darker than the ground colour (terminal line concolorous with

Figs 11-17. Diagnostic genitalia characters (indicated) of *Scopula tenuisocius* Inoue. **11.** ♂ genitalia (PS861). **12.** ♂ aedeagus (PS861). **13.** ♂ aedegus, vesica everted (PS650). **14.** ♀ genitalia (PS663). **15-17.** ♂ 8th segment of abdomen (PS650, PS651, PS861). Compare with closely related species *S. floslactata* (Figs 4-10).

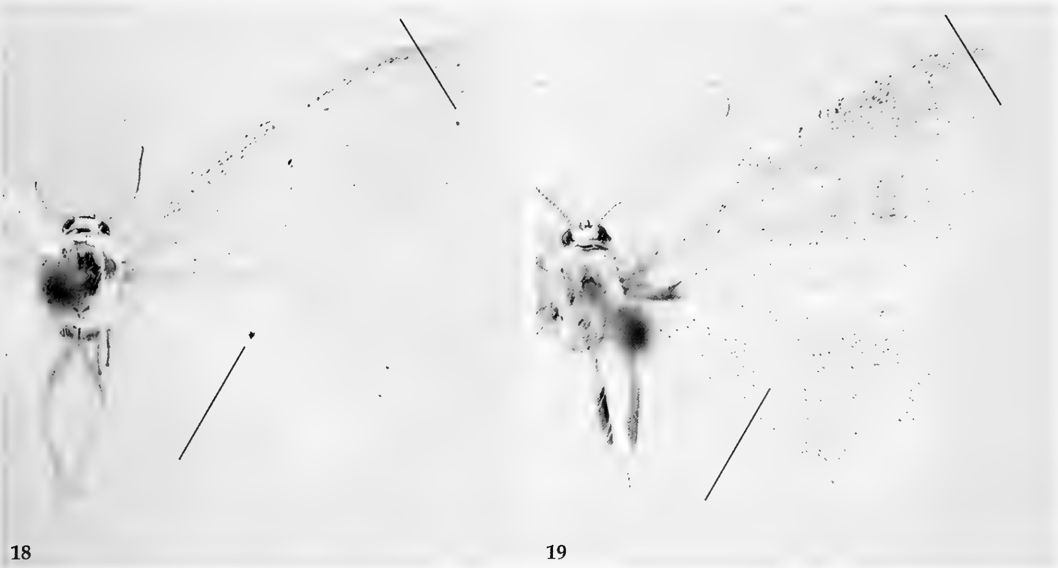
ground colour in *S. floslactata*), and there is a distinct black spot between the vein endings near the forewing apex (spot absent in *S. floslactata*). The costa of the vinculum of the male genitalia capsule is wide in *S. tenuisocius* (narrow in *S. floslactata*) (Figs 4, 11), the aedeagus is wide, curved ventrally (narrow, straight in *S. floslactata*) (Figs 5, 12), the vesica is without a distal diverticulum (present in *S. floslactata*) (Figs 6, 13), the cerata of 8th abdominal sternite are approximately of equal length or the left is longer (right ceras is longer in *S. floslactata*) (Figs 8-10, 15-17), the distal margin of 8th abdominal tergite is without a medial extension (with medial extension in *S. floslactata*) (Figs 8-10, 15-17). The ductus bursae of female genitalia is wide in *S. tenuisocius* (narrow in *S. floslactata*) and the signum is large, covering most of the corpus bursae (signum is small in *S. floslactata*) (Figs 7, 14).

In North-East China adults of *S. floslactata* fly from the end of May to the middle of July, whereas adults of *S. tenuisocius* fly from the end of June to the end of July.

Scopula floslactata (Haworth, 1809)

5♂♂, 5♀♀ (Figs 2, 4-10). NE China – Palaearctic: Europe to Korea and Japan (Shin 1996, Viidalepp 1996). Externally similar to *S. tenuisocius* Inoue, see that species.

Prout has described *S. floslactata* ssp. *claudata* Prout, 1913 from Japan and there are no reports of this taxon outside that country (Inoue 1977), apart from Viidalepp (1996), who considers *S. claudata* valid at the species level and reports the taxon from China, Korea, Japan and Russia: Primorye and South Kuriles whereas he has omitted records of *S. floslactata* from those areas. I have compared material from North-East China to European specimens, where the identity of *S. floslactata* is well established, and to Russian specimens from Novosibirskaja oblast, and found no difference in the structures. Therefore I



Figs 18-19. Diagnostic imago characters (indicated) of Chinese *Scopula* species. **18.** *S. subpunctaria* (Herrich-Schäffer) (abdomen removed). **19.** *S. prouti* Djakonov (abdomen removed).

consider the Chinese specimens to belong to *S. floslactata*.

Scopula pudicaria (Motschulsky, 1861)

14♂♂, 3♀♀. NE China – SE Russia, Korea, Japan (Inoue et al. 1982a, b, Shin 1996, Viidalepp 1996).

Antennae are dorsally suffused with black scales thus making the species easy to identify.

**Scopula asthena* Inoue, 1943

2♂♂, 1♀ (Fig. 1). NE China – SE Russia, Japan (Inoue et al. 1982a,b, Viidalepp 1996).

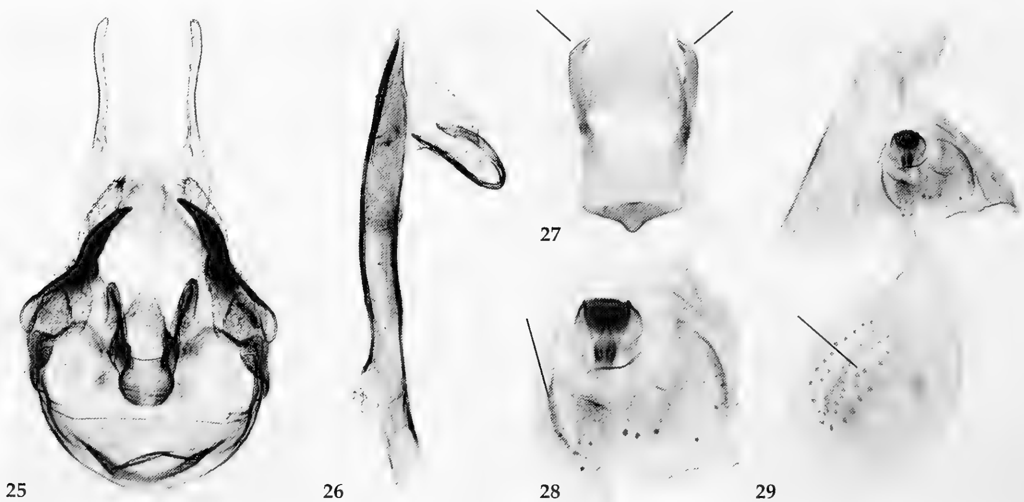
Scopula subpunctaria (Herrich-Schäffer, 1847)

1♂, 9♀ (Figs 18, 20-24). N and NE China – S Palaearctic region (Shin 1996, Viidalepp 1996).

Similar to *S. prouti* Djakonov, from which it can be separated as follows. The terminal line of the wings has a distinct black spot between the vein endings, these are more pronounced near the forewing apex (spots usually absent in *S. prouti*) and the discal spots are often distinct (discal spots are often weak or absent in *S. prouti*) (Figs 18-19). The left ceras of the male 8th abdominal sternite is curved inwards strongly, being in length about half of the mappa, the right ceras exceeds in length the outer margin of the mappa (the cerata are about equal in length in *S. prouti*, barely reaching the outer margin of the mappa) (Figs 22, 27). The signum of the female genitalia is large, the spines are in multiple rows, covering almost the entire length of the corpus bursae (the signum is smaller, and the spines are in a few rows, covering only a small portion of corpus bursae in *S. prouti*) (Figs 24, 29), the sclerotisation cephalad of the ostium bursae (lamella antevaginalis) is slightly folded inwards laterally (the sclerotisation is weak, appearing as a weak ridge in *S. prouti*) (Figs 23, 28).

In many *Scopula* species the structures of the male 8th sternite are a region of great intraspecific polymorphism, especially the length of the cerata (lateral processi) varies, and therefore their usage in species-level diagnoses requires careful interpretation (Hausmann 1999). In that study Hausmann noted also that if there is a closely related species pair, the one species often exhibits polymorphic genitalia, whereas the genitalia of the other does not show such pattern. In Europe, the variation in the length of the cerata in *S. subpunctaria* is dimorphic: either both cerata are long and symmetrical or the left ceras is shortened to half length and strongly curved inwards. On average 35 % of specimens have symmetrical cerata, but regional differences in the morph ratios are considerable (Hausmann 2004). The only Chinese specimen that was available for study has the left ceras shortened and curved inwards (Fig. 22), agreeing with European material (Hausmann 2004). The length of the cerata does not seem to vary in the closely related species *S. prouti* (see below), based on the examined Chinese (n = 8) and South Ussuri (n = 4) specimens (in ZMH). Therefore, despite to which morph the *S. subpunctaria*

Figs 20-24. Diagnostic genitalia characters (indicated) of *Scopula subpunctaria* (Herrich-Schäffer). **20.** ♂ genitalia (PS659). **21.** ♂ aedeagus, vesica everted (PS659). **22.** ♂ 8th sternite of abdomen (PS659). **23.** Ostium bursae and sterigma of ♀ genitalia (PS675). **24.** ♀ genitalia (PS675). Compare with closely related species *S. prouti* (Figs 25-29).



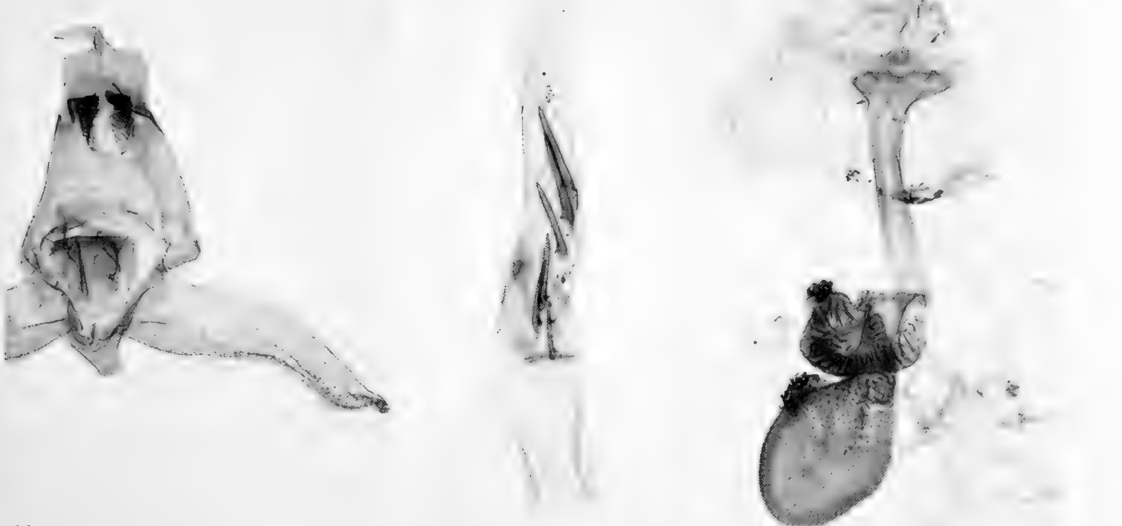
Figs 25-29. Diagnostic genitalia characters (indicated) of *Scopula prouti* Djakonov. **25.** ♂ genitalia (PS673). **26.** ♂ aedeagus, vesica everted (PS673). **27.** ♂ 8th sternite of abdomen (PS673). **28.** Ostium bursae and sterigma of ♀ genitalia (PS676). **29.** ♀ genitalia (PS676). Compare with closely related species *S. subpunctaria* (Figs 20-24).

specimen in question belongs, the right ceras is always considerably longer than the outer margin of the mappa (Fig. 22), whereas in *S. prouti* symmetrical cerata reach barely the outer margin of the mappa (Fig. 27).

Scopula prouti Djakonov, 1935

8♂♂, 1♀ (Figs 19, 25-29). NE China – Korea, Japan, SE Russia (Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996).

Similar to *S. subpunctaria* (Herrich-Schäffer), see that species.



30 31 32

Figs 30-32. Genitalia of *Idaea aversata* (Linnaeus). **30.** ♂ genitalia (PS964) (only right valva is shown). **31.** ♂ aedeagus (PS875). **32.** ♀ genitalia (PS876).

Scopula indicataria ssp. *sufflava* (Prout, 1938)

39♂♂, 3♀♀. N and NE China – Korea, Japan, Russia: Amur, Primorye (Wang 1982, Shin 1996, Viidalepp 1996).

Nominal subspecies from East and South China, in addition there is yet another ssp. from Japan (Prout 1934-39, Inoue et al. 1982a,b). *Argyris indicataria* Walker was transferred from *Somatina* to *Scopula* by Sihvonen (2005).

**Problepsis phoebearia* Erschov, 1870

9♂♂ (Fig. 1). NE China – SE Russia (Viidalepp 1996).

All host-plant records of this genus are from Oleaceae (Holloway 1997).

**Problepsis plagiata* (Butler, 1881)

1♂ (Fig. 1). NE China – Japan, Korea, SE Russia (Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996).

**Cyclophora albipunctata* ssp. *griseolata* (Staudinger, 1897)

1♂, 2♀♀ (Fig. 1). NE China – Korea, Japan, SE Russia. Nominal subspecies from Europe to Mongolia (Viidalepp).

The larva feeds on *Betula* (Mikkola et al. 1985, Ebert et al. 2001).

Timandra recompta ssp. *recompta* (Prout, 1930)

3♂♂. N China – from Central Asia (Kasakhstan) to Mongolia and SE Russia (Shin 1996, Viidalepp 1996, Kaila & Albrecht 1994). Two further subspecies have been described from Japan (Inoue et al. 1982a,b).

Timandra comptaria (Walker, [1863])

3♂♂, 1♀. NE China – Korea, Japan, SE Russia (Inoue 1977, Inoue et al. 1982a,b, Shin 1996, Viidalepp 1996).

Analysis of distribution areas

The distribution areas of many sterrhine moths are rather poorly known and only general conclusions can be drawn. The majority of the observed species (11 species, 44 %) have rather restricted distribution areas, i.e. they are known from the Amur region and the surrounding areas only (Tab. 1). These include species from the genera *Idaea* Treitschke, *Scopula* Schrank (including *Somatina* Guenée, see Sihvonen 2005), *Cyclophora* Hübner and *Timandra* Duponchel. In addition to that, five of the observed species (20 %) have a trans-Palaearctic distribution but a separate subspecies has been described from the Amur region. Considering these together, 64 % of the material have a restricted eastern Palaearctic distribution. Six of the observed species are found throughout the (southern) Palaearctic region: *Idaea pallidata*, *I. aversata*, *I. nitidata*, *Scopula nemoraria*, *S. floslactata* and *Scopula subpunctaria*.

Both observed *Problepsis* species have rather restricted distribution areas also: earlier *P. phoebearia* was known from the Amur basin and Primorye only and *P. plagiata* from Japan and Corea only (Viidalepp 1996). The only species of the Fenglin Nature Reserve that is found in central and eastern parts of the Palaeartic region is *Timandra recompta*.

Discussion

The occurrence of all of the observed species was predictable because they were known earlier from the adjoining areas outside of China. Based on the material collected, the Sterrhinae species diversity of the Fenglin Nature Reserve is at present rather well documented although the field work was done during two short visits. This claim can be justified for several reasons. First, when the number of observed Sterrhinae species is compared to the latest Russian checklist that is based on extensive field work over years, and which reports 44 Sterrhinae species from the neighbouring Primorye territory and Amur basin (Viidalepp 1996), it is seen that over 50 % of all potential species were observed during these short trips. When taken into account that the Fenglin Nature Reserve, which is geographically much smaller in area, doesn't have suitable habitats for many of the missed species, it is likely that only a few new Sterrhinae species can be found. The most likely candidates to be found are from the genera *Idaea* Treitschke, *Scopula* Schrank and *Timandra* Duponchel. Second, by focusing collecting activity towards a pre-selected group, it was possible to make the special effort that was needed to observe these moths. For example, it is well-known that many of the Sterrhinae are diurnal and/or active at dusk and at dawn. Usage of sweep netting at those times resulted in good samples, which might have been missed if different collecting methods were used.

When the distribution areas of the observed species are viewed, it is striking that over 60 % of the species have a rather restricted eastern Palaearctic distribution. This may be artificial, at least in part, because for many species we do not have detailed distributional data available yet and a few may eventually turn out to be more widespread. The material does not allow for the prediction of what could be the cause behind the observed general pattern.

The observation that Hausmann (1999) made in European material in the genus *Scopula*, namely that if there exists a closely related species-pair, the one species often has polymorphic male 8th sternite, whereas the other species does not exhibit such variation in this structure. In this study a closely related species-pair was examined, *S. subpunctaria* and *S. prouti*, which occur sympatrically in the study area. Polymorphism has been reported to occur in *S. subpunctaria* (Hausmann 1999, 2004), and now it was found that in its close relative *S. prouti*, the relationship being judged from the overall similarity, no such variation was found. It remains unknown whether this phenomenon of species-pairs exists globally in *Scopula* or whether it is confined to the Palaearctic region only.

Acknowledgements

I wish to thank Xue Dayong of Beijing Institute of Zoology for help with Chinese Sterrhinae species. Infrastructure for the study was provided by the University of Helsinki, Department of Ecology and Systematics, Division of Population Biology, The Chinese Forestry Academy and The State Natural Reserve Management Bureau of Fenglin, Heilongjiang. Axel Hausmann is thanked for valuable comments and Diane Alaruikka for checking my English. Financial support from the Finnish Museum of Natural History and The Lepidopterological Society of Finland is greatly appreciated.

References

Ebert, G. (ed.), Bartsch, D., Hafner, S., Häuser, C., Nikusch, I., Ratzel, U., Steiner, A. Thiele, J. & R. Trusch 2001. Die Schmetterlinge Baden-Württenbergs, Bd. 8: Nachtfalter VI. – Verlag Eugen Ulmer, Stuttgart, 541 pp.

Fajcik, J. & F. Slamka1996. Die Schmetterlinge Mitteleuropas, I. Bd: Drepanidae, Geometridae, Lasiocampidae, Endromidae, Lemoniidae, Saturniidae, Sphingidae, Notodontidae, Lymantriidae, Arctiidae. – Concordia Trading spol, Bratislava, 113 pp.

Hardwick, D. 1950. Preparation of slide mounts of Lepidopterous genitalia. – Can. ent. **82**: 231–235

Hausmann, A. 1999. Falsification of an entomological rule: polymorphic genitalia in Geometrid moths. – Spixiana **22**: 83-90

–– 2004. Sterrhinae. – In: Hausmann, A. (ed.): The Geometrid Moths of Europe **2**: 1-600. – Apollo Books, Stenstrup

Holloway, J. D. 1997. The moth of Borneo: family Geometridae, subfamilies Sterrhinae and Larentiinae. – Malay. Nat. J. **51**: 1-242

Inoue, H. 1977. Catalogue of the Geometridae of Japan (Heterocera). – Bull. Fac. Domest. Sci., Otsuma Woman's Univ. **13**: 227-346

Inoue, H., Sugi, S., Kuroko, H., Moriuti, S. & A. Kawabe 1982a. Moths of Japan, vol. 1. Text. – Kosansha, Tokyo, 966 pp.

-- 1982b: Moths of Japan, vol. 2. Plates and synonymic catalogue. – Kosansha, Tokyo, 552 pp.

Kaila, L. & A. Albrecht 1994: The classification of the *Timandra griseata* group (Lepidoptera: Geometridae, Sterrhinae). – Ent. Scand. **25**: 461-479

Mikkola, K., Jalas, I. & O. Peltonen 1985. Suomen perhoset, mittarit 1. [The Lepidoptera of Finland, Geometroidea 1]. (In Finnish) – Tampereen kirjapaino, Tampere, 260 pp.

Müller, B. 1996. Geometridae. – In: Karsholt, O. & J. Razowski (eds.): The Lepidoptera of Europe, a distributional checklist: 218-249. – Apollo Books, Stenstrup

Prout, L. B. 1934-39. Die Spanner des Palaearktischen Faunengebietes. – In: Seitz, A. (ed.): Die Gross-Schmetterlinge der Erde, Supplement zu Bd. **4**: 1-253. – Verlag A. Kernen, Stuttgart

Scoble M. J. (ed.) 1999. Geometrid moths of the world: a catalogue (Lepidoptera, Geometridae). – Apollo Books, Stenstrup, 1280 pp.

Shin, Y.-H. 1996. Synonymic list and distribution of the Geometridae of Korea (Lepidoptera). – Center for insect systematics. – Kyu Tek Park, Korea,153 pp.

Sihvonen, P. 2005. Phylogeny and classification of the Scopulini moths (Lepidoptera: Geometridae, Sterrhinae). – Zool. J. Linn. Soc. **143**: 473-530

Skou, P. 1984. The Geometrid moths of northern Europe. – Apollo Books, Stenstrup, 330 pp.

Sugi, S. (ed.)., Yamamoto, M., Nakatomi, K., Sato, R., Nakajima, H., & M. Owada 1987. Larvae of larger moths in Japan. – Kodansha, Tokyo, 453 pp.

Viidalepp, J. 1975. On the fauna of Geometrid moths (Lepidoptera, Geometridae) of the Mongolian People's Republic. – Insects of Mongolia **3**: 438-490

-- 1996. Checklist of the Geometridae (Lepidoptera) of the former U.S.S.R. – Apollo Books, Stenstrup, Denmark, 111 pp.

Vojnits, A. 1977. Archieariinae, Rhodometrinae, Geometrinae II, Sterrhinae II and Ennominae III (Lepidoptera, Geometridae) from Mongolia. – Ann. Hist.-nat. Mus. Nat. Hung. **69**: 165–175

Wang, C. 1982. Record of Insects in the Fun-lin Protection District of Nature. – J. N.-E. For. Inst. (no volume): 142-160

Wang, H. Y. 1997. Geometer moths of Taiwan and it's allied species from the neighbouring countries, vol. 1. – Taiwan Museum, Taipei, 405 pp.

Xue, D. & H. Zhu 1999. Geometridae: Larentiinae. Fauna Sinica, Insecta, vol. **15**. – Science Press, Beijing, 1083 pp.

20 Grimaldi, D. & M. S. Engel: Evolution of the Insects. – Cambridge University Press, New York, 2005. 755 S. ISBN 0-521-82149-5.

Die Insekten sind die artenreichste Organismengruppe der Welt. Das vorliegende Buch von David Grimaldi und Michael S. Engel umfaßt alle Aspekte ihrer Entstehungsgeschichte, von den frühesten, fossil belegten Anfängen, bis hin zur jetzigen Vielfalt. Klar formuliert, angenehm zu lesen, reich und brilliant illustriert, hat es in kurzer Zeit hohen Bekanntheitsgrad erlangt und wird mit Sicherheit zu einem der großen neuen Lehrbücher der Entomologie avancieren. Neben der vermittelten Informationsfülle, die modernste Methoden und neueste Ergebnisse berücksichtigt, ist insbesondere auch die Ästhetik der unzähligen Fotos und Illustrationen hervorzuheben. Ganz offensichtlich haben sich die Autoren hinsichtlich der Qualität ihres Produktes auf keinerlei Kompromisse eingelassen, und man wundert sich fast über den durchaus akzeptablen Preis.

Die ersten Kapitel bieten eine generelle Einführung in die Evolutionsforschung. Gut verständlich wird das erforderliche Allgemeinwissen über die wichtigsten historischen Stationen, zur Anwendung kommende Methoden und die entsprechende Terminologie vermittelt. Andere Kapitel befassen sich mit dem Reich der Fossilien, mit dem Wandel der Zeiten und den damit verbundenen großen Evolutionsereignissen. Die Entstehung der Formenvielfalt des Insektenreiches wird systematisch abgehandelt. Dabei werden für jede Großgruppe und Ordnung die charakteristischen Merkmale angeführt, gefolgt von einer ausführlichen Zusammenfassung der jeweiligen Diversität und Biologie. Immer wieder sind generellere Exkurse über biologische Besonderheiten eingestreut, z.B. Themen wie Biolumineszenz, Sozialverhalten, oder Parasitismus. Hypothesen zur Phylogenie der jeweiligen Gruppen werden vorgestellt und durch Zitate belegt, die zugrundeliegenden Argumente diskutiert, wobei die Autoren oft auch selbst sehr konkret Stellung beziehen. Die übersichtlichen Phylogramme stellen oft neben der Stammesgeschichte auch die Evolution von Schlüsselmerkmalen oder biologischen Anpassungen dar. Hinweise auf weiterführende Literatur sind reichlich vorhanden (allein die Literaturzitate nehmen 70 Seiten ein).

Überaus lobenswert ist die Qualität der Abbildungen. Für jede Gruppe gibt es Fototafeln, die sowohl typische als auch außerordentliche Vertreter darstellen. Die Lebend-Fotos heben die besondere Ästhetik der Insekten hervor und zeigen oft gleichzeitig biologische Besonderheiten aus Larvalentwicklung, Verhalten, etc. Details der Körperstruktur und -ornamentierung werden durch erstklassige rasterelektronenmikroskopische Aufnahmen dargestellt. Die größte Herausforderung dürften aber die Fotos der fossilen Belege geboten haben. Wer selbst einmal ein Bernsteinexemplar fotografiert hat, weiß, daß die immer korrekte Orientierung und Ausleuchtung größte Kunstfertigkeit und auch eine hervorragende Bearbeitung der Steine belegt. Für seine exzellenten Zeichnungen ist Grimaldi berühmt, und das Buch ist reich damit ausgestattet. Viele der fotografierten Fossilien sind zum besseren Verständnis zusätzlich auch als Zeichnung wiedergegeben. Andere Zeichnungen erklären übersichtlich Homologien, die Terminologie von Strukturen und ähnliches.

Dieses Buch ist ein "Muß" für jeden Entomologen und interessierten Laien. Ein wunderbares Geschenk zu jedem Anlaß. Sein einziger Nachteil – es ist etwas zu unhandlich, um es als Gute-Nacht-Lektüre mit ins Bett zu nehmen. M. Kotrba

21. Kreuels, M. & S. Buchholz: Ökologie, Verbreitung und Gefährdungsstatus der Webspinnen Nordrhein-Westfalens. Erste überarbeitete Fassung der Roten Liste der Webspinnen (Arachnida: Araneae). – Verlag Wolf & Kreuels, Havixbeck-Hohenholte, 2006. 116 S. ISBN 3-937455-07-8.

Rote Listen sind, wie sich für fast alle Tiergruppen gezeigt hat, eine wesentliche Grundlage für Arten- und Biotopschutz, daneben auch für die Landschaftsplanung allgemein. Neben Artenlisten und Einschätzungen der Gefährdungskategorien sind zudem Angaben über die geographische Verbreitung sowie die Habitatbindung der jeweiligen Arten unabdingbar für effiziente Naturschutzarbeit. Die hier von Martin Kreuels und Sascha Buchholz vorgelegte Überarbeitung der "Roten Liste" der Webspinnen entspricht diesen Anforderungen in idealer Weise.

Die Autoren stellen das Untersuchungsgebiet (Naturräumliche Gliederung, potentielle natürliche Vegetation), die zur Datenerfassung angewendeten Methoden (Fundortangaben aus über 38 000 Datensätzen) sowie den Aufbau bzw. die eingearbeiteten Informationskategorien ihrer Rote-Liste-Tabelle knapp, aber nachvollziehbar und gut gegliedert dar. Darüber hinaus wird die Problematik von Roten Listen, die immer nur begrenztes Wissen wiedergeben können, angemessen diskutiert. Eine vollständige Bibliographie rundet die vorliegende Studie ab.

Es ergibt sich ein Bestand von 677 Webspinnenarten aus 37 Familien für Nordrhein-Westfahlen, von denen 133 zumindest gefährdet sind. Davon gelten 9 als ausgestorben. Neben diesen Grunddaten finden sich in der Tabelle natürlich Angaben zum Gefährdungsstatus, zur aktuellen Bestandssituation und zur Verbreitung, daneben aber auch Angaben zur Ökologie (Habitat, Abhängigkeit von der Vegetationsschichtung, zusätzlich abiotische Faktoren wie Feuchte und Licht).

Die Autoren haben meines Erachtens eine sehr gelungene und nach dem derzeitigen Stand umfassende Überarbeitung der Roten Liste für die Webspinnen Nordrhein-Westfalens vorgelegt, die ich als Grundlage für Naturschutz und Landschaftsplanung uneingeschränkt empfehlen kann. R. Melzer

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Type Catalogue of the Ichthyological Collection of the Zoologische Staatssammlung München. Part I: Historic type material from the "Old Collection", destroyed in the night 24/25 April 1944

Dirk Neumann

Neumann; D. (2006): Type Catalogue of the Ichthyological Collection of the Zoologische Staatssammlung München. Part I: Historic type material from the "Old Collection", destroyed in the night 24/25 April 1944. – Spixiana **29/3:** 259-285

For the first time a type catalogue of the Ichthyological Collection of the Zoologische Staatssammlung München (ZSM) is published. In 2005 the Global Biodiversity Information Facility (GBIF) programme aimed to create a database of the type specimens in German research museums. In the course of this programme, the fish collection in ZSM was searched for hidden type material previously considered lost and available type material was revised. With the end of the project in 2006 and publication of the type catalogue, the reorganisation and thorough revision of the fish collection in ZSM started by F. Glaw in 1998 is completed.

Besides the data basing of available type material searched by F. Zajitschek and S. Nell already in 1998, there was a strong focus to restore information from historic publications concerning fish collections known to be housed in the "Old Collection" of ZSM in the course of the GBIF programme.

Historic ichthyological collections originally deposited and formally housed in the historic "Old Collection" of the Zoologische Staatssammlung München known so far: fishes from the Spix Collection (Brazilian Expedition of Spix and Martius, 1817-1820), the Bleeker specimens from Dutch East India, the Moritz Wagner Collection with freshwater fishes from Panama and Ecuador (1858-1859), European freshwater fishes from the Collections of Franz von Paula Schrank (1817-1835), Carl Theodor von Siebold (1854-1863) and Bruno Hofer (~ 1900), the Japanese fishes from the Collections Karl August Haberer (1898-1901) and Franz Doflein (1904), the Collection of Princess Therese von Bayern from her expeditions to Mexico (1893) and South America (1898), and the Erich Zugmayer Collection from Tibet (1906) and Pakistan (1911). Nearly all types described from these historic collections were apparently destroyed in the night 24/25 April 1944 during a bombing raid. Only few specimens were saved which were either evacuated separately from the public exhibition or already exchanged from ZSM to other museums, i.e. London (BMNH), Vienna (NMW) and Frankfurt (SMF) already before World War II.

As known from literature sources so far, the historic "Old Collection" of the ZSM ichthyological collection contained at least 10000 specimens including 541 type specimens of 88 taxa (36 holotypes and 505 syntypes) out of 51 families. None of the types from the "Old Collection" mentioned in this first part of the type catalogue were found during a type search in 2005 in the ichthyological collection of ZSM; all types mentioned here have to be considered as lost in Word War II.

During the type search in 2005, additional historic specimens including type material were re-discovered in the Zoologische Präparatesammlung der Ludwig-Maximilians-Universität München. A review of this collection is given in the second part of this type catalogue. The ichthyological section of this collection was transferred and incorporated into ZSM in 2004.

Dirk Neumann, Zoologische Staatssammlung, Münchhausenstr. 21, 81247 München, Germany; e-mail: Dirk.Neumann@zsm.mwn.de.

Introduction

The early Zoologische Staatssammlung München (ZSM) was institutionally founded as "Naturalienkabinett" [cabinet of natural curiosities] by King Maximilian I. Joseph on 1 May 1807. Besides the Spix material from Brazil the early fish collection included mainly freshwater fishes from Bavaria collected by Franz Paula von Schrank who curated the combined zoological-anthropological collections during Spix's expedition to Brazil. Both, the Spix collection and the collections of Schrank mark the beginning of the ichthyological collection in the ZSM. Under the supervision of Siebold (1853-1885) the combined zoological collections were thematically regrouped and part of the material was exhibited in a Cabinet of natural curiosities. For this purpose, public and scientific collections were separated and curated independently (Balss 1926). During this time ZSM received specimens from the Bleeker Collection from Dutch East India (Fricke 1991) when Bleeker in the late 1860ies or 1870ies donated duplicates from his collection to various reputated collections to promote his attempts to find an employment at a prestigious University. Except one lot with two specimens of *Drepane punctata* (ZSM 310-311), the complete Bleeker Collection in ZSM was destroyed. While the early fish collection focused mainly on the South American and European ichthyofauna this focus was shifted toward South East Asia when the collection was surely doubled with the deposition of approximately 6000 marine fishes from the Haberer & Doflein collections from Japan, mainly deep sea fishes. ZSM received additional deep sea specimens from the Valdivia Expedition (1898-1899); the material (including type material) was spread among University and Natural History collections in Germany. Specimens from this collection were re-discovered from the Zoological Collection of Ludwig-Maximilians University, and there is a high probability that material was deposited in ZSM, too.

Only 300 lots of the historic collection survived the war. This material was probably saved because it was part of the public exhibition in the cabinet of the Wilhelminum that was evacuated earlier than the scientific collection.

Part I of the type catalogue gives a historical review of the Ichthyological Collection in ZSM and reviews single historic collections.

Part II of the type catalogue includes type material either deposited after the Second World War or re-inventoried form the "Old Collection" by Schindler in the re-built Ichthyological Collection in ZSM. Historic types rediscovered from the "Old Collection" and the Zoological Collection of Ludwig-Maximilians University in the type search in 2005 are included in part II since they were subsequently registered in Schindler's new inventory.

Part III of the type catalogue includes the Spix material collected during the Brazil Expedition (1817-1820) and described in Selecta genera et species piscium Brasiliensium that was destroyed in the Second World War.

Historical review of the ichthyological collection in ZSM

In the course of the secularization of the Bavarian monasteries in 1803 their rich collections and libraries were centralised and rationalised under Graf von Montgelas and fused with the newly founded collection of the "Bayerische Akademie der Wissenschaften" [Bavarian Academy of Sciences] (Mauermayer 1986). This early collection included zoological, botanical, mineralogical and physical objects from the private collection of King Maximilian, then stored in the Residenz in Munich, the geological Collection of the "Riedlsche Kabinett", which was previously stored in the "Akademie der Wissenschaften" [Academy of Sciences] and the "Herzoglich Zweibrücken'sche Kabinett". After the death of Maximilian I., King Ludwig I. translocated the University from Landshut to the Wilhelminum in Munich in 1827. With this step the collection of the Academy of Sciences gained more independence. However, the academy collections were partly incorporated in the former university collections and vice versa, aimed to mainly serve university interests and demands (Balss 1926). Consequently, different university professors were in charge for the curation of the combined collections. Montgelas thematically reorganised this mixed collections of natural and physical curiosities in 1811 as Zoologisch-Zootomische Sammlung and Johann Baptist Spix was appointed first curator of this museum (Balss 1926).

The historic ichthyological collection of ZSM dates back to specimens collected by Spix together with Carl Friedrich Philipp von Martius during their famous Brazil Expedition (1817-1820). Early ZSM collections received additional material under Spix's curatorship in 1825 just before he died, when he travelled to The Netherlands to buy "zoological objects" (Balss 1926), which likely included fish specimens, too.

During Spix's Brazil Expedition the zoological collections were provisionally curated by Franz von Paula Schrank (1747-1835), founder of the Botanical Gardens Munich. Besides his botanical interests, Schrank contributed much to the knowledge of the Bavarian fauna, mainly on insects and fishes (Balss 1926). Together with the Spix specimens from Brazil, the fishes collected by Schrank in Bavarian rivers marked the origin of the ZSM ichthyological collection.

During the time of Carl Theodor von Siebold's curatorship (1853-1885) the zoological collection and especially the fish collection was substantially enlarged. Balss (1926) separately mentions the large collection of fish skeletons that was built up under Siebold's supervision. Besides this dry material it is not unlikely that the separately prepared anatomical objects of the collection are dating back to Siebold, too, including formalin preserved specimens, which were used for university lectures.

The comparative-anatomical collections, then housed in the Institute of Physiology, was incorporated into the zoological collections and moved to the Wilhelminum under Siebold. A part of the combined collections was then already accessible to the public in a Cabinet of natural curiosities (Balss 1926), which was also under Siebold's supervision. The historic zoological collections grew steadily: already comprising single halls scattered over three floors in the Wilheminum under Siebold in 1872, the collections comprised parts of the 2nd, and the complete 3rd and 4th floor in the northern tract of the Wilhelminum in 1908 (Balss 1926).

Richard von Hertwig (1850-1937) followed Siebold as curator of the zoological collection. During his time Franz Doflein started to work as assistant in the collection and was appointed vice director in 1909. The fish collection gained largely from the work of Karl August Haberer and especially of Franz Doflein and their large collections of deep sea fishes from Japan. Many of the preparated hagfishes in the university collection originate from Dofleins expedition to California (USA) in 1904. Besides these two comprising collections, the ichthyology section received additional material from Expeditions of G. Merzbacher (Tian-Shan range 1904-1910), Lorenz Müller (Amazon, 1910), E. Zugmayer (Tibet, 1906-1917) and Kapitän Michell (Congo and Orinoco, 1909-1913). Additional material of Bavarian freshwater fishes was deposited by Bruno Hofer. In the early 20th century the ichthyological collection grew steadily and demanded a separate curation within the zoological collections of ZSM. With Erich Zugmayer for the first time one scientific volunteer was in charge for the curation of the ichthyological section of the zoological collections. In 1926 ZSM received the substantial zoological bequests of Princess Therese von Bayern, including her considerable fish collection (Balss 1926).

Karl von Frisch succeeded Hertwig in 1925, both as director of the Zoological Institute as well as director of the ZSM. To this time, 10 different collections were housed in the Wilhelminum in Neuhauser Str. 10 (Mauermayer 1986). Frisch strongly demanded a separation at least of the institute and the collection; in 1932 the Zoological Institute moved to a new building at Luisenstraße 14, where it was situated until the building was demolished early 2005. With this partition, the zoological collections of the University and ZSM were separated institutionally after 122 years. The university collection included – with few exceptions collected in the 1970ies – mainly historic specimens. Specimens originating from Siebold, Hofer, Zugmayer, Müller; moreover single types from the Collections of Spix and Doflein were recently rediscovered in the Zoological Collection of the Ludwig-Maximilians University Munich (LMU). To preserve the history of the specimens that were formerly housed in this second historic fish collection in Munich, the acronym ZPLMU is here introduced; it is the abbreviation for "Zoologische Präparatesammlung der Ludwig-Maximilians-Universität München" [Zoological objects collection of the Ludwig-Maximilians University Munich].

While Frisch stayed as head at the Zoological Institute, Hans Krieg became director of the now independent Zoologische Staatssammlung, which was still housed in the Wilhelminum at Neuhauser Straße.

Krieg earned reputation after his Gran Chaco transition (II. Deutsche Gran-Chaco-Expedition 1925-1927) from Asuncion (Paraguay) to Santa Cruz de la Sierra (Bolivia). A third expedition to northern Paraguay followed from 1931-1932. On his IV Expedition to Patagonia, Alto Paraná, Mato Grosso and Sao Paulo Krieg was assisted by his student Otto Schindler (1906-1959). Inspired from his scientific work, Krieg thematically reorganised the public exhibition from systematically grouped natural curiosities towards a more modern biogeographical conception and separated the public exhibition from the scientific collection in 1928 (Kraft & Huber 1992). Schindler, who volunteered in the ichthyology already under Hertwig, became the first curator of the ichthyological collection in 1939 (Mauermayer 1986).

In 1943 the ZSM staff managed to evacuate large parts of the collection. The fish collection had been packed and was stored in the entrance of the Wilhelminum. Before the planned evacuation in the forthcoming days, fire and demolition bombs destroyed the entire building during a British bombing raid on the night of 24/25 April 1944, including the complete historic ichthyological collection, the old inventories and all further data concerning this collection (Terofal 1983, Gruber 1992). As known so far from historic literature sources, the historic ichthyological collection in ZSM contained at least 10000 specimens. However, this may be only a rough estimate that is available from various historic publications referring to single specimens known to be housed in the ichthyological collection in ZSM; e.g. the Haberer & Doflein Collections contained about 6000 specimens (Balss 1926).

The ichthyological section in ZSM was re-opened under Otto Schindler in 1949. He revised the remains of the historic "Alte Sammlung" [Old Collection] and re-inventoried remaining specimens from the "Old Collection" with a new numbering system and in a new inventory. The Schindler inventory is the only available inventory of the fish collection of ZSM known today. Therefore, Schindler's work after World War II marks the transition from the historic "Old Collection" towards a modern ichthyological collection. As a consequence, the present fish collection in ZSM is a complete post-war collection in which only single historic specimens are left.

The Moritz Wagner Collection (1813-1887)

Moritz Wagner (1813-1887), professor at the Ludwig-Maximilians University Munich, explored Central-South America from 1853-1854 (Honduras, San Salvador, Nicaragua and Costa Rica) and 1858-1859 (Panama). Wagner deposited his comprising fish collections in the Zoologische-zootomische Staatssammlung, the early ZSM under Siebold (Wagner 1864: 66 [2 as separate]). While he shipped part of his material already during his first expedition, major parts of the 1853-1854 collection were lost because inadequate preservation at the end of his journey. The remaining material that should be shipped later on was destroyed during an earthquake on 16 April 1854 in San Salvador (Wagner, 1870). Most of the material stored in the Old Collection probably dates from his second expedition. The location "Neu-Granada" in some specimens was later corrected by Wagner (1864) into "Panama" to indicate that he exclusively collected in this former province of New-Granada; the former Viceroyalty of New Granda, included the today's countries Colombia, Panama, Venezuela and Ecuador, but changed its name in 1863 into United States of Colombia. Venezuela and Ecuador became independent already in 1830, while Panama remained part of New-Granada as province until 1903.

Siebold asked Rudolf Kner to work on the fishes of the Wagner Collection (Kner 1863: 221; Wagner 1864: 66 [2 as separate]). Kner accepted, and worked together with his "jungen Freund" [young friend] Franz Steindachner on the Wagner material. The Wagner Collection comprised at least 72 specimens (22 genera, 32 species); this number is available from the second part of Kner's work (1863), where he gives a complete list of all specimens he received from Siebold. It remains unclear, whether Siebold sent the complete Wagner material to Vienna, or if the Collection included even more specimens, which were not exchanged. The discordant counts of specimens in the publications from 1863 and 1864 suggest that more material was available. Kner (1863) described 16 new species and 2 new genera from this material. Kner mentions that both, he and Steindachner did work on the material, but Kner (1863) is the sole author of the "provisional" descriptions published 1863 in "Sitzungsberichten" and thus must be considered as sole author of these species. All new species are indicated by the abbreviation "n." (nova), the two new genera with "nov. gen." (novus genus) and formally described with a short Latin diagnosis, accompanied with remarks in German on closely related species. He already indicated that the same species will be published later on in the "Abhandlungen" in more detail. The figure captions in the original description refer to unpublished plates, which were delayed (Kner 1863:221) and therefore not included in the 1863 work. The same species were described a second time one year later together with the now finished but renumbered plates (Kner & Steindachner 1864).

Unlike many descriptions of this time Kner did not only explicitly indicate the number of specimens he had for his descriptions, but refers also to a "Verz. No." (Verzeichnis-Nummer [registry number]) of each single specimen of his new species. These numbers are obviously corresponding with a list of specimens Siebold sent together with the material, probably to identify the single specimens included in the shipment: "Die jeder Species beigefügten Nummern stimmen mit jenen überein, welche den Fischen selbst angehängt und in dem von ... Professor Siebold mir eingesandten Verzeichnisse angegeben sind [The given numbers of every species correspond to those which are attached to the fishes themselves and are given in the inventory ... Professor Siebold sent to me]". These numbers were directly attached to single fishes identifying individuals. Siebold started as curator of the combined zoological collections in 1853, and received the material from Wagner shortly afterwards in 1854, while Wagner was still in Panama (Wagner 1864: 66 (2 as separate]). However, the bulk of Wagner's material arrived later and originates from his second expedition (1858-1859). Kner published discontinuous registry numbers ranging from 3 up to 298, so that it seems unlikely that they were used e.g. for plain numbering of lots on a packing list or loan agreement; would this have been the case, the numbers surely would be continuously and perhaps sorted by species. The Wagner Collection Siebold sent to Kner included 72 specimens, which exactly agrees with the count of all "Verz. No." mentioned by Kner in his work. Assuming that the published numbers for the Wagner material are indeed inventory numbers and that Siebold registered incoming material in an inventory file according to the actual arrival of specimens in his collection, then the old ZSM inventory would date back to Siebold and the Wagner collection would be the earliest record of ZSM inventory numbers. The Wagner material arrived in 1854 and was one of the earliest acquisitions after Siebold started to work as curator in 1853. Siebold specimens from the historic ZPLMU Collection (as early as May 1854, details see below) have already high numbers like ZPLMU 1768, *Spinachia spinachia*, or ZPLMU 1662, *Blicca bjoerkna*, because of the independent curation of the University Collection. Therefore, the "Verz. No." published by Kner in 1863 are assumed as early ZSM inventory numbers. To be not confused with today's records, the suffix "[Old Collection]" is added, according to Schindler's treatment and identification of historic (pre-war) material.

It is not unlikely that additional fish material Wagner collected during his "Transkaukasien Expedition" (Wagner 1864: 75 [11 as separate]) was deposited in ZSM, too.

The Collection of Carl Theodor von Siebold (1804-1885)

Siebold's material originates mainly from Germany, with a special focus on Bavarian freshwater fishes and the fishes from the pre-alpine lakes in Bavaria. Starting on 3 May 1854 he built up a comprising collection of European freshwater fishes for the planned publication of the "Süßwasserfische Mitteleuropas". In the preface of his book he gives a brief report where he collected or purchased the specimens he used in his work (Siebold 1863). He obtained specimens from the Danube drainage from the following fish markets: "Ulm, Regensburg, Passau, Linz und Wien". But his main source was the fish market in Munich, where he also purchased "Bodensee-Fische, Teichfische aus Mittelfranken, Schwaben, von der Oberpfalz und von Böhmen, Lachsarten vom Niederrhein und der Elbe ... [fishes from Lake Konstanz, pond fishes from Middle Franconia, Swabia, Upper Palatinate and Bohemia, salmon-species from the Lower Rhine and Elbe]".

Additional material was purchased at (quoted from Siebold, 1863: 5):

Rhine drainage: Basel, Freiburg, Straßburg, Speyer, Mainz, Heidelberg, Mannheim, Nürnberg, Bamberg, Würzburg and Frankfurt (Main).

Weser drainage: Meinigen, Eisenach, Kassel, Münden and Göttingen.

Elbe drainage: Prag, Dresden, Magdeburg, Hamburg, Wunsiedel, Leipzig, Hof, Naumburg, Halle and Berlin.

Oder drainage: Breslau, Stettin and Swinemünde.

Weichsel drainage: Danzig [Gdansk], Elbing [Elblag] and Thorn [Toruń].

Pregel drainage: Königsberg [Kaliningrad] and Heilsberg [Lidzbark Warminski].

Lake Konstanz: Lindau, Bregenz, Konstanz, Überlingen and Langenargen.

Further material from the former East Prussia: Rivers Memel, Russ and Tilsit [Sowetsk], Kurisches Haff, Frisches Haff at Braunsberg [Braniewo], Frauenberg [Frombork] and Tolkemit [Tolkmicko].

Switzerland: Genfer See [Lake Geneva].

Etsch drainage (Italy): Brixen, Bozen, Meran and Mals.

Siebold received further material from Italy from the following persons: Pirona, Udine; Jan, Milano; De Filippi, Turin (all Italy); Coinde, Lyon; Gervais, Montpellier (both France).

In an annotation (page IV) in the preface of his "Süsswasserfische Mitteleuropas", Siebold (1863) clearly states that he deposited his complete material of freshwater fishes which he obtained from 1854 onwards in the zoological cabinet of the Bavarian State: "Sämtliche von mir gesammelten oder durch Schenkung an mich gelangten Süsswasserfische werden in dem hiesigen zoologischen Cabinete des Staates aufbewahrt. ... München, den 20ten Juni 1863 [All freshwater fishes collected by myself or received by me as donation are stored in the local zoological cabinet of the State ... Munich, 20th June 1863]". Balss (1926) confirms that the Siebold Collection of Bavarian and European freshwater fishes was housed in the early ZSM collection. Even if nearly the complete collection was lost in World War II, single specimens are still traceable in ZSM. Only two of them can be unambiguously identified as Siebold specimens: ZSM 2 (1), *Abramidopsis leukartii*, Danube at Regensburg; v. Siebold; ZSM 302 (1), *Platessa flesus*, Helgoland; v. Siebold. Two more lots have been re-discovered in the ZPLMU collection: ZSM 30549 (1) ex ZPLMU 1768, *Spinachia spinachia*, Kieler Bucht, Ostsee [Kiel Bay, Baltic Sea], v. Siebold; ZSM 30610 (1) ex ZPLMU 1662, *Blicca bjoerkna*, Chiemsee [Lake Chiemsee].

The Japanese Collections of August Haberer (1864-1941) and Franz Doflein (1873-1924)

The Haberer and Doflein Collection contained more than 6500 marine fishes (481 species out of 319 genera in 130 families) (Anonymous, no date). Both collections originate from the Sagami Bay off Yokohama and Aburatsubo, including many deep sea fishes but also large specimens like an Ocean Sunfish *(Mola mola)* and a Goblin Shark that was described by Engelhardt as *Scapanorhynchus dofleini*. Later specimens were purchased by Doflein from the natural history dealer Alan Owston in Yokohama.

The collection of A. Haberer

The Haberer Collection was mainly based on material from his second journey to China and Japan from 1898-1901. Due to the Boxer Rebellion Haberer was forced to leave China immediately; however he managed to save his vertebrate fossils from the Yangtze-Kiang River. Before he left for Japan, he assembled a comprehensive marine collection from the Chinese Sea off Shanghai. However, major parts of his collection, more than 5000 specimens, originate from the Sagami Bay off Yokohama, among them 3000 fishes. Haberer donated his large collection of zoological objects to ZSM (Doflein 1905). Doflein revised parts of the Haberer Collection, and worked scientifically on the crustaceans.

The collection of F. Doflein

In 1904 Doflein received a grant from King Luitpold von Bayern which allowed him to explore the deep sea fauna in the Sagami Bay. The Doflein Collection included also more than 3000 fishes, nearly exclusively marine material and only few specimens from brackish or freshwater habitats. A station list with detailed information on coordinates, depths and duration of single trawls was published by Doflein in 1910. Additional material originates from local fishermen, which used hooked diabolo lines for long-line fishing in greater depths in the Aburatsubo Bay. Two of them, Kuma and Tsuschida, assisted Doflein also onboard of the steam vessel "Zuso Maru", which Doflein hired for 18 days for his surveys in the Sagami Bay. Due to bad weather it was actually possible to trawl only on 8 days from 8-15. XI.1904.

The fishes from both collections were revised by Victor Franz, who described 22 new species from the available material. Few specimens from the Haberer & Doflein Collections survived World War II because they were part of the public exhibition in the Cabinet of natural curiosities, or stored in the ZPLMU collection. Two of the originally 19 syntypes of *Ditrema temmincki* var. *jordani* Franz, 1910 were rediscovered in a type search in 2005 (D. Neumann): ZSM 257 und ZSM 30574 (ex ZPLMU 1757).

The Collection of Princess Therese von Bayern (1850-1925)

Princess Therese von Bayern showed an early interest in natural science; however women were not admitted at universities in Bavaria until 1903. She owes her extensive knowledge to her private studies in geology, ethnology botany and zoology. At the age of 21 she started to travel European countries and soon was capable to speak and write 12 languages. During her expedition-like journeys she travelled incognito, preferred a spartanic life-style and allowed not more than three personnel attendants. In 1892 Therese von Bayern was appointed an honorary member of the Geographical Society and of the Academy of Sciences, five years later she was awarded with an honorary doctorate at the Philosophical Faculty of the University of Munich – an exception for a female autodidact at this time.

During her six month lasting expedition to South America in 1898, Therese von Bayern compiled a comprising zoological, botanical and ethnological collection she brought back to Munich. The fish collection included 228 specimens from 91 fish species, from which Steindachner (1900 & 1902) described eight new species. The zoological bequests of Therese von Bayern were disposed by her will to the Zoologische Staatssammlung München (Balss 1926), including also the fishes from her earlier Mexico Expedition in 1893. Steindachner received few duplicates from the Collection Therese von Bayern, which were exchanged, as far as traceable in NMW files, from Therese von Bayern herself after Steindachner finished his work on her fish collection. As far as available from Steindachner (1900 & 1902) the Collection Therese von Bayern from Mexico and South America included 139 species. However, the actual number of specimens and actual size of the complete Collection Therese von Bayern at the time of deposition in ZSM is unknown. For detailed information on locations and dates of the three South-America Expeditions of Princess Therese von Bayern the reader is referred to Huber (1998).

The Collection of Erich Zugmayer (1879-1939)

Zugmayer explored the fish fauna of East and Central Asia in two expeditions. The first led him in 1906 to West and Central Tibet, to Ladakh (East Kashmir) and to the Panggong Lake. During this expedition Zugmayer collected 23 species with more than 400 specimens; Zugmayer (1909a) described four of them as new, *Schizothorax montanus*, *Schizothorax ladacensis*, *Schizothorax tibetanus* and *Aspiorhynchus sartus*. The complete collection and all syntypes were originally deposited in ZSM (Zugmayer 1910: 5). Supplemental information on field camps, dates etc. is detailed in Zugmayer (1909b).

In his second expedition in 1911 he explored Balutschistan, today a province of the Islamic Republic of Pakistan. He followed an invitation to build up a representative collection of marine fishes for the National Museum of Sir Henry McMahon in Quetta. From February to May 1911 he travelled the costal area near today's Iranian border while from June to mid September he explored central Balutschistan. In October, the last part of his journey, he worked in the north-eastern part of the country, the (east) Kashmir region.

At the beginning of his journey he mainly stayed in the harbours of Pasni, Gwadar, Sonmiani and Ormara, where he purchased numerous specimens from local fishermen for his collection. However, since he was more interested in freshwater fishes, he collected additional material from the rivers Purali [Porali] at Las Bela, the Dasht at Suntsar and Turbat, the Vidar at Sonmiani, and in the surroundings of the regional capital of Quetta, in Pishin, in Mastung and Nushki southeast of Quetta [Pishin Lora basin], and in the vicinity of Panjgur in the Rakhshan-Valley (Central Makran Range).

The collection comprised more than 300 specimens out of 40 species and 18 families. From this collection *Torpedo zugmayeri*, *Platycephalus platysoma*, *Petroscirtes cristatus*, *Labeo gedrosicus*, *Labeo macmahoni*, *Scaphiodon watsoni* var. *belense*, *Scaphiodon daukesi*, *Nemacheilus baluchiorum* and *Nemacheilus brahui* were described as new species or varieties. Zugmayer deposited this material in ZSM (Zugmayer 1913: 5); all species described from this expedition are solely based on the Zugmayer material deposited in Munich. The complete Zugmayer collection from the Balutschistan Expedition in Munich was apparently destroyed during the second World War, except single syntypes that have been exchanged already before World War II: *Labeo macmahoni*, NMW 81256 (1); *Scaphiodon daukesi*, NMW 19784 (1), ZSI F8028/1 (1), ZSI F 8032/1 (1); *Nemacheilus baluchiorum*, NMW 19851 (1).

Type Catalogue (part I)

The families appear in alphabetical order; species are listed respectively in their according genera. If not stated elsewise, the taxon name is valid as originally published; if single species have been synonymised or placed in different genera, the valid name and a detailed reference is given under "Remarks". Citations from the original description appear in "quotation marks", additional information from different sources or translations in [brackets].

Abbreviations

coll:	Collection
don:	donatus (lat.), donated
leg:	leget (lat.), collected by
NMW:	Naturhistorisches Museum Wien, Vienna
TL:	total length
Verz. Nr.:	Verzeichnis Nummer, early ZSM inventory numbers of the Old Collection
ZPLMU:	Zoologische Präparatesammlung der Ludwig-Maximilians-Universität München
ZSI:	Zoological Survey of India, Calcutta
ZSM:	Zoologische Staatssammlung München, Munich
ZSM [Old Collection]:	historic pre-war ichthyological collection of Zoologische Staatssammlung München, Munich

Anguillidae

Anguilla capensis Kaup, 1860

Abh. Naturwiss. Ver. Hamburg, (2): 18, Pl. 2 (fig. 3).

Holotype (?): ZSM [Old Collection], 660 mm SL, "vom Cap".

Remarks. Original description in the singular; apparently based on one specimen. No further collecting data available in ZSM. According to the Eschmeyer Catalogue (updated online version 17 April 2006) the synonymy with *Anguilla mossambica* (Peters, 1852) as proposed by Ege (1939) is questionable.

Anostomidae

Leporinus muyscorum Steindachner, 1900

Anz. Akad. Wiss. Wien 37 (18): 206.

Holotype (unique): ZSM [Old Collection], "18.8 cm lang", Rio Lebrija, eastern tributary of the middle Rio Magdalena at Santander (Colombia); leg: purchased out of canoas of local fishermen, Coll. Th. v. Bayern, VII. 1898.

Remarks. Apparently based on a single specimen, but not stated explicitly in the original description. The species was illustrated and described in more detail, based on a single specimen, in Steindachner (1902: 142-143 [54-55 as separate] Pl. 2, Fig. 2); holotype fixed by monotypy (ICZN Art. 73.1.2). Additional information on the length taken from Steindachner (1902), information on the collection date retrieved from preface of Therese v. Bayern (1902). Holotype of *Leporinus muyscorum* ex private Collection Therese v. Bayern.

Ariidae

Bagrus arioides Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 227, Fig. 15.

Holotype (unique): ZSM Verz. No. 273 [Old Collection], "Rio Bayano" (Panama); leg: M. Wagner, 1858-1859.

Remarks. Original description based explicitly on a single specimen, holotype fixed by monotypy (ICZN Art. 73.1.2), which was originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "15" in original description refers to unfinished (and unpublished) plates. The species was described in more detail by Kner & Steindachner later on (1864: 47-49) but not illustrated. It is unlikely that Siebold exchanged the holotype to NMW; there is no evidence in the NMW acquisition files that type material of *Bagrus arioides* was deposited in NMW (Wellendorf, pers. comm. Oct. 2005). According to Kailola (2004) a synonym of *Cathorops multiradiatus* (Günther, 1864).

Atherinopsidae

Atherinichthys albus Steindachner, 1894

Anz. Akad. Wiss. Wien 31 (15): 149.

Syntypes: ZSM [Old Collection] (5), 13.3-25.4 mm TL (?), Lake Cuitzeo near Morelia (Mexico); leg: local fishermen; purchased at local fish market, coll. Th. v. Bayern, 4.X.1893.

Remarks. Additional information on the collection date from the preface of Bayern (1895). ZSM received the syntypes from the private Collection Therese v. Bayern (see historical review for details); no type material of this species is available in NMW (Wellendorf, pers. comm. 22.VI.2006). Placed for doubtful reasons by Dyer (in: Reis et al. 2003) into synonymy of *Chirostoma estor* Jordan, 1880 without comparing the type of *Ch. estor* with comparative material from Lake Cuitzeo. Needs further research and is tentatively treated as valid until a thorough revision of the group is published.

Atherinichthys brevis Steindachner, 1894

Anz. Akad. Wiss. Wien 31 (15): 149.

Syntypes: ZSM [Old Collection] (2), 51 & 53 mm TL (?), Lake Cuitzeo near Morelia (Mexico); leg: local fishermen; purchased at local fish market, coll. Th. v. Bayern, 4.X.1893.

Remarks. Additional information on the collection date from the preface of Bayern (1895). ZSM received the syntypes from the private collection Therese v. Bayern (see historical review for details); no type material of this species is available in NMW (Wellendorf, pers. comm. 17.X.2005). Steindachner (1895) described and illustrated the species again in a new combination as *Chirostoma breve*. Placed for doubtful reasons by Dyer (in: Reis et al. 2003) into synonymy of *Chirostoma jordani* Woolmann, 1895 without comparing type material of *Ch. jordani* with comparative material from Lake Cuitzeo. The hydrologically closed Lake Cuitzeo basin is not connected to neighbouring Rio Lerma system, the terra typica of *Ch. jordani*. Needs further research and is tentatively treated as valid until a thorough revision of the group is published. Valid as **Chirostoma breve** (Steindachner, 1894).

Atherinichthys grandoculis Steindachner, 1894

Anz. Akad. Wiss. Wien 31 (15): 149.

Holotype (unique): ZSM [Old Collection] (1), 122 mm TL (?), "aus dem Pátzcuaro-See [from Lake Pátzcuaro]" (Mexico); leg: local fishermen; purchased at local fish market, coll. Th. v. Bayern, 6.X.1893.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). Additional information on the collection date from the preface of Bayern (1895). ZSM received the syntypes from the private collection Therese v. Bayern (see historical review for details); no type material of this species is available in NMW (Wellendorf, pers. comm. 17.X.2005). Steindachner (1895) described and illustrated the species again in a new combination as *Chirostoma grandocule*.

Balitoridae

Nemachilus baluchiorum Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 599.

Syntypes: ZSM [Old Collection] (13), "Panjgur" [Rakhshan-Valley (Central Makran Range), Prov. of Baluchistan] (Islamic Republic of Pakistan); leg: E. Zugmayer, VII-IX.1911.

Remarks. All syntypes of *Nemachilus baluchiorum* were originally housed in ZSM (see historical review for details); one syntype was obviously exchanged to NMW already before World War II; NMW 19851 (1) ex ZSM [Old Collection]. The remaining 12 syntypes were apparently lost in WW II; not found during a type search in July 2005 (D. Neumann). Data restored from original description and Zugmayer (1913b). According to Mirza (2003) valid as **Schistura baluchiorum** (Zugmayer, 1912).

Nemachilus brahui Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 598-599.

Syntypes: ZSM [Old Collection] (24), 100-130 mm TL (?), "Kelat", Prov. of Baluchistan (Islamic Republic of Pakistan); leg: E. Zugmayer, X.1911.

Remarks. All syntypes of *Nemachilus brahui* were originally housed in ZSM (see introduction for details). Data restored from original description and Zugmayer (1913b). According to Mirza (2003) valid as **Triplophysa brahui** (Zugmayer, 1912).

Blenniidae

Petroscirtes cristatus Zugmayer, 1913 (b)

Abh. Akad. Wiss. München 26 (6): 20-21.

Syntypes: ZSM [Old Collection] (4), 60-84 mm TL (?), "Omara", Prov. of Balutschistan (Islamic Republic of Pakistan); leg: E. Zugmayer, V.1911.

Remarks. The syntypes of *Petroscirtes cristatus* were originally housed in ZSM (see introduction for details). According to Springer & Gomon (1975) a synonym of *Omobranchus mekranensis* (Regan, 1905).

Bothidae

Arnoglossus violaceus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 61, Pl. VII, Fig. 56.

Holotype (unique): ZSM [Old Collection], 23.5 cm TL, "Aburatsubo" (Japan); coll. Doflein, no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). According to Amaoka 1969: 122 a synonym of *Parabothus coarctatus* (Gilbert, 1905).

Laeops lanceolata Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 62, Pl. VIII, Fig. 60.

Syntypes (9): ZSM [Old Collection], 8-9 cm TL, "Fukuura" (Japan); coll. Haberer, no date. ZSM [Old Collection], Dzushi, 50-100 m (Japan); coll. Doflein, no date.

Remarks. One syntype was apparently exchanged to BMNH before World War II: BMNH 1931.11.16.2 ex ZSM [Old Collection]. The metres in the Dzushi specimens probably refer to the depths at which the fishes were caught.

Laeops variegata Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 63, Pl. VIII, Fig. 59.

Syntypes (4): ZSM [Old Collection], "Fukuura" (Japan); coll. Haberer, no date. ZSM [Old Collection], "Dzushi" (Japan), 50-100 m; coll. Doflein, no date.

Remarks. The metre values for the Dzushi specimens probably refer to the depths at which they were caught. According to Li & Wang (1995) a synonym of *Laeops lanceolata* Franz, 1910.

Trachypterophrys raptator Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 60-61, Pl. VII, Fig. 54.

Syntypes (6): ZSM [Old Collection] (4 ?), 14.5-16.5 cm TL, "Fukuura" (Japan); coll. Haberer, no date.

Remarks. Two of the syntypes were apparently exchanged before World War II from ZSM [Old Collection]: BMNH 1931.11.16.1 (1) and SMF 7433 (1). The remaining four syntypes of *Trachypterophrys raptator* housed in ZSM were apparently destroyed in WW II. According to Amaoka (1969) a synonym of *Chascanopsetta lugubris* Alcock, 1894.

Callanthiidae

Callanthias japonicus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 40, Pl. VI, Fig. 49.

Holotype (unique): ZSM [Old Collection], "Aburatsubo" (Japan); coll. Doflein; no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2).

Carcharhinidae

Carcharias sanctithomae Engelhardt, 1912

Zool. Anz. 39 (21/22): 646.

Syntypes: ZSM [old Collection] (1), female, 1.0 m, [Island of] "St. Thomas", Virgin Islands (United States of America); leg: Dr. Jäger, 1908. ZSM [Old Collection] (4), heads, 16-18 cm, same data.

Remarks. Originally published as "*sancti-thomae*"; correction of spelling mandatory (ICZN Art. 32.5.2.3). Collection data supplemented from original description.

Carcharias marianensis Engelhardt, 1912

Zool. Anz. 39 (21/22): 647.

Holotype (unique): ZSM [Old Collection], female, 40 cm, [off Island of] "Guam-Insel", Marianas Islands (United States of America); coll. Doflein, purchased from Owston, 1904.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); collection data supplemented from original description. According to Compagno (1984) a synonym of *Carcharhinus melanopterus* (Quoy & Gaimard, 1824).

Centrophoridae

Centrophorus drygalskii Engelhardt, 1912

Zool. Anz. 39 (21/22): 645-646.

Syntypes: ZSM [Old Collection] (1), female, 41 cm, [off] "Enoura: Sagamibai [Sagami Bay]" (Japan); coll. Doflein, purchased from Owston, 1904. ZSM [Old Collection] (1), male, 39 cm, Sagami Bay off "Yokohama" (Japan); coll. Haberer, 1901.

Remarks. Collection data from original description, additional information from Doflein (1904). According to Compagno (1984) questionably a synonym of *Centrophorus acus* Garman, 1906.

Chaetodontidae

Chaetodon ocellifer Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 49-50, Pl. V, Fig. 35.

Syntypes: ZSM [Old Collection] (3), 1.85-3.3 cm TL, "Nagasaki, durch Consul Müller-Beek, coll. Doflein" [Nagasaki (Japan); leg (?): Consul Müller-Beek, coll. Doflein]; no date.

Remarks. According to Burgess (1978) a synonym of *Chaetodon speculum* Cuvier; 1831, which is questionable (no comparative material was compared).

Osteochromis larvatus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 52, Pl. V, Fig. 43.

Holotype (unique): ZSM [Old Collection], 2.15 cm TL, "Aburatsubo" (Japan); coll. Doflein"; no date.

Remarks. Based on a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2).

Champsodontidae

Champsodon snyderi Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 82, Pl. IX, Fig. 74.

Syntypes (approx. 40): ZSM [Old Collection], "Fukuura" (Japan); coll. Haberer, no date. ZSM [Old Collection], "Misaki" (Japan); coll. Doflein, no date. ZSM [Old Collection], "Yagoshima" (Japan); coll. Doflein, no date.

Remarks. The exact number of syntypes remains unclear; Franz (1910) mentions that the material comprised approx. 40 specimens ("Ca. 40 Exemplare") but gives neither total number of specimens nor an exact specimen count from the different locations. A neotype (MCZ 100468) was designated by Nemeth (1994).

Characidae

Chalceus atrocaudatus Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 227, Fig. 14.

Holotype (unique): ZSM Verz. No. 143 [Old Collection], "Vom Westabhange der Anden im Staate Ecuador [western slopes of the Andes in the State of Ecuador]"; leg: M. Wagner, 1858-1859.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2). Originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "14" in original description refers to unfinished (and unpublished) plates. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: XX [44-46 in separate], Pl. 4, Fig. 2 & 2a). According to Lima (in Reis et al. 2003) valid as **Brycon atrocaudatus** (Kner, 1863).

Chalcinopsis chagrensis Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 226, Fig. 13.

Syntypes (5): ZSM Verz. No. 3, 16, 47, 129, 234 [Old Collection], "Rio Chagres" (Panama); leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "12" in original description refers to unfinished (and unpublished) plates. Duplicates have been exchanged to / were retained in NMW probably on behalf of Siebold; NMW 62661 (2), 22106 (1) ex ZSM [Old Collection]. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 42-43, Pl. 5, Fig. 3). According to Lima (in Reis et al. 2003) valid as **Brycon chagrensis** (Kner, 1863).

Chalcinopsis striatulus Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 226, Fig. 12.

Syntypes (5): ZSM Verz. No. 15, 117, 200, 204, 206 [Old Collection], "Panama"; leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "12" in original description refers to unfinished (and unpublished) plates. Duplicates have been exchanged to / were retained in NMW probably on behalf of Siebold; NMW 62662 (2) ex ZSM [Old Collection]. It is doubtful if the NMW specimens were included in the original syntype series; according to NMW acquisition files the duplicates were received in 1864 (Wellendorf, pers. comm. X.2005). The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 38-41, Pl. 5, Figs. 2 & 2a) but based on nine instead of five syntypes; needs further investigation in NMW acquisition and inventory files. The Munich specimens were apparently destroyed in World War II. According to Lima (in Reis et al. 2003) valid as **Brycon striatulus** (Kner, 1863).

Pseudochalceus lineatus Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 225-226, Fig. 11.

Syntypes (2): ZSM Verz. No. 146, 292 [Old Collection], "Vom Westabhange der Anden im Staate Ecuador [western slopes of the Andes in the State of Ecuador]"; leg: M. Wagner, 1858-1859.

Remarks. Both syntypes were originally deposited in ZSM (Wagner, 1864; see historical review for details). Figure caption "11" in original description refers to unfinished (and unpublished) plates. Two specimens were retained in NMW or exchanged by Siebold; NMW 56739 ex ZSM [Old Collection]. NMW 56738 (1) includes a in situ preparation of the intestines of one of the two specimens retained in MW 56739 (Wellendorf, pers. comm. 17.Oct.2005). It remains unclear if the specimens stored in NMW 56739 were included in the original syntype series. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 35-38, Pl. 5, Fig. 1 & 1a) but based on three instead of two syntypes; needs further investigation in NMW acquisition and inventory files. Munich specimen(s) apparently destroyed in World War II.

Cichlidae

Acara coeruleopunctata Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 222, Fig. 3.

Syntypes (5): ZSM Verz. Nr. 5, 30, 116, 219, 239 [Old Collection], Rio Chagres (Panama); leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "3" in original description refers to unfinished (and unpublished) plates. Duplicates were retained in NMW or exchanged by Siebold; NMW 33635-36 (1, 1), 22168 (1) ex ZSM [Old Collection]. It remains unclear if these specimens were included in the original syntype series. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 16-18, Pl. 1, Fig. 2) but based on 9 instead of 5 syntypes; needs further investigation in NMW acquisition and inventory files.

The Munich specimens were apparently destroyed in World War II. According to Kullander (in Reis et al. 2003) valid as **Aequidens coeruleopunctatus** (Kner, 1863).

Heros altifrons Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 223, Fig. 4.

Syntypes (3): ZSM Verz. Nr. 19, 103, 195 [Old Collection], "Von Panama" (Panama); leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "4" in original description refers to unfinished (and unpublished) plates. One syntype was retained in NMW or exchanged by Siebold; NMW 21204 (1) ex ZSM [Old Collection]. However, it remains unclear if this specimen was included in the original syntype series. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 11-13, Pl. 2, Fig. 1) but based on eight instead of three syntypes with a new type location "Neu-Granada"; needs further investigation in NMW acquisition and inventory files. The Munich specimens were apparently destroyed in World War II. According to Kullander (in Reis et al. 2003) valid as **Amphilophus altifrons** (Kner, 1863).

Heros sieboldii Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 223, Fig. 5.

Syntypes (5): ZSM Verz. Nr. 6, 24, 27, 179, 287 [Old Collection], "Von Panama an der Südseite" [from Panama at the southern side); leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "5" in original description refers to unfinished (and unpublished) plates. One syntype was retained in NMW or exchanged by Siebold; NMW 22012 (1) ex ZSM [Old Collection]. It remains unclear if this specimen was included in the original syntype series. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 13-15, Pl. 2, Fig. 2) but based on 11 instead of 5 syntypes with a new type location ("Neu-Granada und vom westlichen Abhange der Panama Landenge" [New-Granada and western slopes of the Panama Isthmus]); needs further investigation in NMW acquisition and inventory files. The Munich specimens were apparently destroyed in World War II. According to Kullander (in Reis et al. 2003) valid as **Tomocichla sieboldii** (Kner, 1863).

Hoplarchus pentacanthus Kaup, 1860

Arch. Naturgesch. 26 (1): 129-131, Pl. 6 (Fig. 1).

Holotype (unique?): ZSM [Old Collection], no data available.

Remarks. No detailed information on number of specimens, type location or date is available from the original description. The material Kaup used for his description likely originated from the Spix Collection from Brazil (for details see Kottelat 1988: 87). The original description is in the singular; thus it may be assumed that it was based on a single specimen, which would then be the holotype by monotypy (ICZN Art. 73.1.2). No *Hoplarchus* specimen from the Old Collection or historic Kaup material is available in ZSM. Only one South American cichlid from the historic collection is available in ZSM. However, this specimen is a *Hypselecara*; the anal spine counts of this specimen disagree with Kaup's description. Originally described as marine species, placed in Labridae. According to Kullander (in Reis et al. 2003) a synonym of *Hoplarchus psittacus* (Heckel, 1840).

Hoplarchus planifrons Kaup, 1860

Arch. Naturgesch. 26 (1): 131-132.

Holotype (unique ?): ZSM [Old Collection], no data available.

Remarks. No detailed information on number of specimens, type location or date is available from the original description. The material Kaup used for his description likely originated from the Spix Collection from Brazil (for details see Kottelat 1988: 87). The original description is in the singular; thus it may be assumed that it was based on a single specimen, which would then be the holotype by monotypy (ICZN Art. 73.1.2). No *Hoplarchus* specimen from the Old Collection or historic Kaup material is available in ZSM (see above). Originally described as marine species, placed in Labridae; species inquirenda in Cichlidae (Kullander in Reis et al. 2003).

Clupeidae

Platycephalus platysoma Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 595-596.

Holotype (unique): ZSM [Old Collection], 570 mm TL (?), "Gwadar", Prov. of Baluchistan (Islamic Republic of Pakistan); leg: local fishermen, purchased from local fish market by E. Zugmayer, II-V.1911.

Remarks. Based on a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). Originally deposited in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1913b).

Coregonidae

Coregonus acronius var. *bavarica* Hofer (in Vogt & Hofer, 1909)

Süsswasserfische Mitteleuropas: 341, Fig. 194.

Syntypes (?): (20), Lake Ammersee, within Danube catchment, Upper Bavaria (Germany); leg: local fishermen, coll. B. Hofer, VI.1908. (20), same location; local fishermen, coll. B. Hofer, VII.1908.

Remarks. The description is based on 40 specimens. Hofer examined 2 lots with 20 specimens each, one on 19 June and the other on 10 July. While the first lot only included ripe specimens, 18 fishes from the second lot had already spawned. Specimens were dissected and ripe ovaries were weighed. It remains unclear whether or not Hofer preserved the dissected specimens. Hofer material is available in different Collections in Munich, i.e. at ZPLMU, ZSM, and at the Institute for Zoology, Fish Biology & Fish diseases, Faculty of Veterinary Medicine of LMU, the former Hofer Institute. Hofer became Curator at the Anatomical Collection of LMU in 1894 and professor of fish biology at the Faculty of Veterinary Medicine at the LMU two years later. It is therefore not unlikely that Hofer preserved and deposited specimens from this series in one of these collections. In addition, the fish hatchery of the Hofer Institute in Wielenbach also kept a larger anatomical collection, but the majority of this collection was discarded between 1950 and 1980. In this collection there is obviously no coregonid material left today (E. Bohl, pers. comm. Apr. 2006); it was either destroyed in the Second World War, or discarded later on in the 1950s. The same apparently applies to material in various University Collections in Munich. The remaining fish lots from the former Hofer Institute were transferred to ZSM in 2000. In this collection one small undissected *Coregonus* is available, but this specimen has no data and is unlikely a syntype of this species. No *Coregonus* material was discovered among Hofer specimens in the ZPLMU or ZSM Collections during type searches in 2005 (D. Neumann). The Anatomical Collection was not searched. If material was preserved at all, it was likely lost in World War II. The species was revalidated as **Coregonus bavaricus** Hofer, 1910 by Kottelat (1997) and redescribed by Freyhof (2005).

Coregonus exiguus danneri Vogt (in Vogt & Hofer, 1909)

Süsswasserfische Mitteleuropas: 332, Pl. 14 (Fig. 4).

Syntypes: Lake Traunsee (Austria); leg (?): H. Danner, no date.

Remarks. Vogt received several specimens from Lake Traunsee from Danner (Vogt, in original description). Evidently, the species is based not on a single holotype (Kottelat 1997) but on a syntype series, as Vogt refers to "Exemplare" [specimens] he received from Danner. At least one specimen must have been available to prepare the illustration on plate XIV. Kottelat (1997) indicates that the illustration on the plate dates from 1908, the text from 1909 without giving evidence for his assumptions. Vogt died already in 1895 in Geneva, where he was professor of zoology and geology, 13 years prior to the publication of *C. exiguus danneri*. It remains unclear, whether Vogt preserved Danner material (that was likely housed originally in Geneva and subsequently transferred later on by Hofer from Geneva to Munich), or if Hofer received fresh material from lake Traunsee to finish the plates, which would than have syntype status. It has not been possible to trace information that Hofer transferred Vogt specimens to Munich; needs further research. If syntypes were preserved and transferred to Munich they were likely destroyed in Word War II or discarded later on in the 1960ies in the Hofer Institute. Valid as **Coregonus danneri** (Freyhof, 2005).

Salmo renke Schrank, 1783

Schrift. Berlin. Gesells. Naturf. Fr. v. 4: 427-429.

Syntypes (?): ZSM [Old Collection], Lake Starnberger See, Upper Bavaria (Germany); Coll. Schrank (?), autum 1782.

Remarks. Original description in the singular; even if Schrank writes that he examined "diesen Fisch" [this fish], he mentiones that this species barely reaches one foot ("erreicht fast niemals einen Fuß"), which implicates that Schrank compared at least two specimens; a mean length is given with "9 Zoll" [9 Bavarian (?) inch]. The existence of syntypes is assumed in accordance with Recommendation 73F (ICZN; "Avoidance of assumption of holotype"). Syntypes were likely part of the Collection Schrank and housed in the early ZSM fish collection (see historical review and *Salmo saxatilis* for details). No further collecting data is available in ZSM. According to Freyhof (2005) valid as **Coregonus renke** (Schrank, 1783).

Cyprinidae

Algansea lacustris Steindachner, 1894

Anz. Akad. Wiss. Wien 32 (17): 166.

Holotype (unique): ZSM [Old Collection], 20 cm TL (?), "aus dem Pátzcuaro-See [from Lake Pátzcuaro]" (Mexico); leg: purchased from local fishermen at local fish market, Th. v. Bayern, 6.X.1893.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2). Additional information on the collection date from the preface of Bayern (1895). ZSM received the Holotype from private Collection Therese v. Bayern (see historical review for details); no type material of this species is available in NMW (Wellendorf, pers. comm. 17X.2005). Species later described in more detail again by Steindachner (1895).

Algansea tarascorum Steindachner, 1894

Anz. Akad. Wiss. Wien 32 (17): 166.

Holotype (unique): ZSM [Old Collection], 135 mm TL (?),"Fundort: Pátzcuaro-See [Location: Lake Pátzcuaro]" (Mexico); leg: purchased from fishermen at local fish market, Th. v. Bayern, 6.X.1893.

Remarks. Based on a single specimen, not on a syntype series as stated in the Eschmeyer Catalog (updated On-Line version, 17 April 2006); holotype fixed by monotypy (ICZN Art. 73.1.2). Additional information on the collection date from the preface of Bayern (1895). ZSM received the holotype from the private Collection Th. v. Bayern (see introduction for details); no type material of this species is available in NMW (Wellendorf, pers. comm. 17X.2005). Species later described in more detail by Steindachner (1895). According to Gilbert (1998) in synonymy with *Algansea lacustris* Steindachner, 1894.

Aspiopsis merzbacheri Zugmayer, 1912 (a)

Ann. Mag. Nat. Hist. (Ser. 8) 9 (54): 682.

Syntypes: ZSM [Old Collection] (16), River Manas [River Manas He] at Manas, west of Urumtchi on northern slopes of the Tian-Shan range (People's Republic of China); leg: G. Merzbacher, 1906-1907.

Remarks. All syntypes were originally housed in ZSM (see historical review for details); one syntype was obviously exchanged to BMNH already before World War II; BMNH 1914.3.2.1 (1) ex ZSM [Old Collection]. The species was described in more detail and illustrated in Zugmayer (1913a). The Munich specimens were apparently lost in WW II. Collection data restored from original description and Zugmayer (1913a). According to Yang & Hwang (in: Wu, 1964) valid as **Leuciscus merzbacheri** (Zugmayer, 1912).

Aspiorhynchus sartus Zugmayer, 1909 (a)

Ann. Mag. Nat. Hist. (Ser. 8) 4 (23): 432.

Holotype (unique): ZSM [Old Collection], male, 530 mm TL (?),"Kisil Su near Kashgar", Tarim River basin (People's Republic of China); leg: E. Zugmayer, V-VI.1906.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). The holotype was originally deposited in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1909b). Species illustrated and described in more detail by Zugmayer (1910: 288-291, Pl. 12 (Fig. 4). Original country given mistakenly as "Turkey" in the Eschmeyer Catalog (On-line version, updated 17. April 2006). According to Tsao (in: Wu, 1964) a synonym of *Aspiorhynchus laticeps* (Day, 1877).

Labeo gedrosicus Zugmayer 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 598.

Syntypes: ZSM [Old Collection] (5), "Panjur" [Rakhshan-Valley (Central Makran Range), Prov. of Baluchistan] (Islamic Republic of Pakistan); leg: E. Zugmayer, VII-IX.1911.

Remarks. All syntypes were originally housed in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1913b).

Labeo macmahoni Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 597.

Syntypes: ZSM [Old Collection] (13), "Dasht River, near Suntsar and Turbat", Prov. of Baluchistan (Islamic Republic of Pakistan); leg: E. Zugmayer, II-V.1911.

Remarks. All syntypes of *Labeo macmahoni* were originally housed in ZSM (see historical review for details); one syntype was obviously exchanged to NMW already before World War II; NMW 81256 (1) ex ZSM [Old Collection] (see *Tetragonopterus ocellifer* for details). However, this specimen has not been found in NMW (Wellendorf, pers. communication 17.Oct.2005). The remaining 12 syntypes deposited in Munich were apparently lost in World War II. Collection data restored from original description, additional information from Zugmayer (1913b). According to Mirza (2003) valid as **Tariqilabeo macmahoni** (Zugmayer, 1912).

Parabarbus habilis Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 8-9, Pl. III, Fig. 3.

Holotype (unique): ZSM [Old Collection], "Sagamibucht bei Aburatsubo; coll. Doflein." [Sagami Bay at Aburatsubo (Japan); coll. Doflein]; no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2).

Scaphiodon daukesi Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 596-597.

Syntypes: ZSM [Old Collection] (10), 110-190 mm TL (?), "irrigation channels and pools near Panjgur" [Rakhshan-Valley (Central Makran Range), Prov. of Baluchistan] (Islamic Republic of Pakistan); leg: E. Zugmayer, VII-IX.1911.

Remarks. All syntypes were originally housed in ZSM (see historical review for details); one syntype was obviously exchanged with NMW already before World War II; NMW 19784 (1) ex ZSM [Old Collection]. Two additional syntypes were obviously exchanged to ZSI; ZSI F8028/1 (1), F8032/1 (1) ex ZSM [Old Collection]. However, an exchange of syntypes with ZSI is not recorded in ZSM files; if the ZSI specimens are types, they must have been exchanged before 1945. The remaining 7 (?) syntypes in ZSM were apparently lost in WW II. Collection data restored from original description, additional information from Zugmayer (1913b). According to Coad (1996) in synonymy of *Cyprinion milesi* (Day, 1880).

Scaphiodon watsoni var. *belense* Zugmayer, 1912 (b)

Ann. Mag. Nat. Hist. (Ser. 8) 10 (60): 596.

Syntypes: ZSM [Old Collection] (42), "River Purali [Porali], near Las Bela [Bela]", Prov. of Baluchistan (Islamic Republic of Pakistan); leg: E. Zugmayer, II-V. 1911.

Remarks. All syntypes were originally housed in ZSM (see historical review for details); two syntypes were obviously exchanged with NMW already before World War II; NMW 19833 (2) ex ZSM [Old Collection]. An exchange of syntypes with ZSI is not recorded in ZSM files and would have to date from before 1945. The remaining syntypes in ZSM were apparently lost in World War II. Collection data restored from original description, additional information from Zugmayer (1913b). According to Coad (1996) in synonymy with *Cyprinion watsoni* (Day, 1872).

Schizothorax ladacensis Zugmayer, 1909 (a)

Ann. Mag. Nat. Hist. (Ser. 8) 4 (23): 433-434.

Syntypes: ZSM [Old Collection] (2), River "Indus near Leh" (India); leg: E. Zugmayer, X-XI.1906.

Remarks. Both syntypes were originally deposited in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1909b). Species illustrated and described in more detail by Zugmayer (1910: 280-281, Pl. 12, Fig. 2). According to Kullander et al. (1999) a synonym of *Schizothorax labiatus* (McClelland, 1842).

Schizothorax montanus Zugmayer, 1909 (a)

Ann. Mag. Nat. Hist. (Ser. 8) 4 (23): 434-435.

Holotype (unique): ZSM [Old Collection] "Indus near Leh" (India); leg: E. Zugmayer, X-XI.1906.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). Originally deposited in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1909b). Species illustrated and described in more detail by Zugmayer (1910: 279-280, Pl. 12 (Fig. 1). According to Kullander et al. (1999) in synonymy with *Schizothorax esocinus* Heckel, 1838.

Schizothorax tibetanus Zugmayer, 1909 (a)

Ann. Mag. Nat. Hist. (Ser. 8) 4 (23): 433.

Syntypes: ZSM [Old Collection] (4), 1 ex. 350 mm TL (?) & 3 ex. smaller, "little river running into the Tso Rum, Panggong Lakes (Tibet); leg: E. Zugmayer, VI-IX. 1906.

Remarks. All syntypes were originally deposited in ZSM (see historical review for details). Collection data restored from original description, additional information from Zugmayer (1909b). Species illustrated and described in more detail by Zugmayer (1910: 281-283, Pl. 12 (Fig. 3). According to Chen & Cao et al. (in Yue 2000) a synonym of *Schizothorax labiatus* (McClelland, 1842).

Dactylopteridae

Dactyloptena jordani Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 80-81, Pl. IX, Fig. 72 & 72a.

Holotype (unique): ZSM [Old Collection], 8.5 cm TL, "Japan" no type locality and date available from original description.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). Franz does not give a type locality nor any other information concerning collector/collection, so it remains unclear, if the specimen originally belonged to either the Haberer or the Doflein collection, which would have allowed to at least to restrict the type locality to a more confined area in Japan. In a table Franz (1910: 100) is listing this species as new for "Japan", so "Japan" is the only available geographical information from the original description. According to Eschmeyer (1997) a synonym of *Dactyloptena gilberti* Snyder, 1909.

Echeneidae

Echeneis megalodiscus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 69, Pl. VIII, Fig. 57.

Syntypes: ZSM [Old Collection] (1), "Yokohama" (Japan); coll. Haberer, no date. ZSM [Old Collection] (6), "Aburatsubo" (Japan); coll. Doflein, no date.

Remarks. According to Lachner (1973:640) a synonym of *Remora osteochir* (Cuvier, 1829).

Eleotridae

Eleotris picta Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 223, Fig. 6.

Syntypes (3): ZSM Verz. Nr. 245, 263, 267, Rio Bayano (Panama); leg: M. Wagner, 1858-1859.

Remarks. All syntypes were originally housed in ZSM (Wagner 1864; see historical review for details). Figure caption "6" in original description refers to unfinished (and unpublished) plates. One doublet was exchanged to or retained in NMW probably on behalf of Siebold; NMW 76866 (1) ex ZSM [Old Collection]. The Munich syntypes were apparently destroyed in World War II. The species was described and illustrated more detailed as *Eleotris pictus* by Kner & Steindachner later on (1864: 18-21, Pl. 3, Fig. 1).

Engraulidae

Engraulis macrolepidota Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 224, Fig. 7.

Holotype (unique): ZSM Verz. Nr. 280 [Old Collection], Rio Bayano, (Panama); leg: M. Wagner, 1858-1859.

Remarks. Based on a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). The holotype was originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "7" in original description refers to unfinished (and unpublished) plates. It is unlikely that Siebold exchanged the holotype to NMW; no such specimen is known to be housed in the NMW collection (Wellendorf, pers. comm. Oct. 2005). The species was described and illustrated in more detail as *Engraulis macrolepidotus* by Kner & Steindachner (1864: 21-23, Pl. 3, Fig. 2) later on, again based on a single specimen. Whitehead (1970) erroneously selected a lectotype assuming that NMW 2808 (Lectotype, 104.7 mm SL) and NMW 2807 (1, Paralectotype) were part of a syntype series. However, these specimens did not originate from a syntype series; according to NMW files they were acquired in 1874 and 1876, respectively (Wellendorf, pers. comm. Oct. 2005). Neither of the lots is marked or treated as containing type material in NMW. The lectotype designation is invalid (ICZN Art. 74.2), as the specimen selected was not a syntype. According to Nelson (2004) valid as **Anchovia macrolepidota** (Kner, 1863).

Engraulis poeyi Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 224, Fig. 8.

Holotype (unique): ZSM Verz. Nr. 7 [Old Collection], Rio Bayano (Panama); leg: M. Wagner, 1858-1859.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2), originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "8" in original description refers to unfinished (and unpublished) plates. It is unlikely that Siebold exchanged the holotype to NMW; not found in NMW (Wellendorf, pers. comm. Oct. 2005). The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 23-24, Pl. 3, Fig. 3). According to Whitehead et al. (1988) valid as **Lycengraulis poeyi** (Kner, 1863).

Etmopteridae

Spinax unicolor Engelhardt, 1912

Zool. Anz. 39 (21/22): 645.

Holotype (unique): ZSM [Old Collection], female, 55 cm, "Sagamibai [Sagami Bay]" (no exact location available; probably off Yokohama) (Japan); coll. Haberer, 1901.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); collection data restored from original description. According to Compagno (2001) valid as **Etmopterus unicolor** (Engelhardt, 1912).

Exocoetidae

Exocoetus lineatus japonicus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 24-25.

Syntypes: ZSM [Old Collection] (3), "Oyama, Sagamibai, coll. Haberer" [Oyama, Sagami Bay (Japan); coll. Haberer]; no date.

Remarks. According to Nakabo (2002) a synonym of *Cheilopogon pinnatibarbatus* (Bennett, 1831), but a valid subspecies as described.

Gasterosteidae

Gasterosteus williamsoni japonicus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 19, Pl. III, Fig. 10.

Material: ZSM [Old Collection] (2), "von Misaki, coll. Doflein" [from Misaki (Japan); coll. Doflein]; no date.

Remarks. Published in the original description as *Gasterosteus* not as "*Gastrosteus*" as given in the Eschmeyer Catalog (update Online version 17. April 2006). Permanently invalid, preoccupied by *Gasterosteus japonicus* Houttuyn, 1782. No material exists for the name proposed by Franz, as there never is type material for unavailable names. According to Okada (1961) the junior homonym is a synonym of *Gasterosteus aculeatus* Linnaeus, 1758, subspecies *microcephalus* Girard, 1854.

Gobiidae

Ctenogobius macropteryx Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 67, Pl. VI, Fig. 45.

Syntypes: ZSM [Old Collection] (2), "Dzushi, 80 m" (Japan); coll. Doflein, no date.

Remarks. The metre values for the Dzushi specimens refer probably to the depth in which the specimens were caught. A neotype (NSMT-P 46608) was selected by Ikeda et al. (1995: 304). According to Shibukawa & Suzuki (2004: 116) valid as **Vanderhorstia macropteryx** (Franz, 1910).

Glossogobius intermedius Aurich, 1938

Int. Rev. Hydrobiol. Leipzig, 38 (1/2): 147-XX, Fig. 14.

Syntypes: ZSM [Old Collection], 62-100 mm TL, "Mahalona-See" [Lake Mahalona], cent. Sulawesi [Celebes] (Indonesia); leg: R. Woltereck, X.1932. ZSM [Old Collection], 62-100 mm TL, "Towoeti-See" [Lake Towuti], cent. Sulawesi [Celebes] (Indonesia); leg: R. Woltereck, X.1932.

Remarks. Collection data restored from Woltereck (1933).

Trypauchenophrys anotus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 68, Pl. IX, Fig. 77.

Syntypes: ZSM [Old Collection] (2), each 5.2 cm SL, "Fukuura" (Japan); coll. Haberer, no date.

Remarks. Murdy & Shibukawa erroneously refer to a holotype (SMF 7432) but according to the original description the species is based on two syntypes. The type status of SMF 7432 is unclear; the current synonymy is based on a comparison of

SMF 7432. According to Murdy & Shibukawa (2003) a synonym of *Caragobius urolepis* (Bleeker, 1852).

Goodeidae

Characodon luitpoldii Steindachner, 1894

Anz. Akad. Wiss. Wien 31 (15): 147-148.

Syntype: ZSM [Old Collection] (2), females "13 und 14.6 cm lang", Lake Pátzcuaro, Michoacan, (Mexico); leg: local fishermen, purchased from Canoas at local fish market, coll. Th. v. Bayern, 6.X.1893.

Remarks. Syntypes ex private Collection Therese v. Bayern; additional information on the collecting date restored from preface of Th. v. Bayern (1894: 519 [3 as separate]). The same species was described and illustrated again by Steindachner (1895: 528-529 [12-13 in separate], Pl. 2, 3-3b), presumably based on the same specimens; however, the length of the specimens is given with 135 mm and 140 mm, respectively. Th. v. Bayern donated one of the syntypes to Steindachner, this specimen is available in NMW 12996 (pers. comm. Wellendorf, X.2005); the Munich syntype is apparently lost. According to Nelson (2004) valid as **Goodea luitpoldii** (Steindachner, 1894).

Haemulidae

Pomadasys schyrii Steindachner, 1900

Anz. Akad. Wiss. Wien 37 (18): 207-208.

Holotype (unique): ZSM [Old Collection], 17.3 cm, purchased from local fishermen on fish market in Guayaquil (Ecuador); coll. Th. v. Bayern, 17.VIII.1898.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); additional information on the location and collection date restored from preface of Th. v. Bayern (1902). Holotype of *Pomadasys schyrii* ex private Collection Therese v. Bayern. Species later changed in *schryi* when species was illustrated and described in more detail in Steindachner (1902).

Pristipoma humile Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 221, Fig. 1.

Holotype (unique): ZSM Verz. Nr. 133 [Old Collection], Rio Bayano (Panama); leg: Moritz Wagner, 1858-1859.

Remarks. *Pristipoma humile* Kner, 1863 (Non Bowdich, 1825). Holotype fixed by monotypy (ICZN Art. 73.1.2) and originally deposited in ZSM (Wagner 1864; see historical review for details). Holotype (USNM 30957) and paratypes (USNM 30957) in USNM doubtfully referred to Kner (Eschmeyer Catalog, On-line version, updated 27. Apr. 2006). Data restored from original description and Wagner (1864). The figure caption "1" in the original description refers to unfinished (and unpublished) plates; species illustrated and described in more detail by Kner & Steindachner later on (1864: 3-5, Pl. 1, Fig. 1). Objectively invalid; preoccupied by *Pristipoma humilis* [*humile*] Bowdich, 1825, replaced by *Pomadasys bayanus* Jordan & Evermann, 1898.

Hypoptychidae

Hypoptychus steindachneri Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 8, Pl. V, Fig. 28.

Holotype (unique): ZSM [Old Collection], 7.7 cm TL, "von Fukuura, coll. Haberer" [from Fukuura (Japan); coll. Haberer]; no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). According to Lindberg & Krasyukova (1975: 201) a synonym of *Hypoptychus dybowskii* Steindachner, 1880.

Loricariidae

Loricaria aurea Steindachner, 1900

Anz. Akad. Wiss. Wien 37 (18): 206-207.

Holotype (unique): ZSM [Old Collection], 16.9 cm SL, Rio Magdalena at Bodega Central (Colombia); leg: local fishermen; coll. Th. v. Bayern, 18.VI.1898.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); supplemental collecting data taken from preface of Th. v. Bayern (1902: 90 [2 as separate]). ZSM [Old Collection] (1) ex private Collection Therese v. Bayern. The species was depicted and described more detailed in Steindachner (1902: 138-139 [50-51 as separate], Taf. V, Fig. 1, 1a). According to Ferraris (in Reis et al. 2003) valid as **Sturisoma aureum** (Steindachner, 1900).

Loricaria uracantha Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 228, Fig. 18.

Syntypes (2): ZSM Verz. No. 130, 135 [Old Collection], "Rio Chagres" (Panama); leg: M. Wagner, 1858-1859.

Remarks. Syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Obviously none of the syntypes is available in NMW (Wellendorf, pers. com. Oct.2005). The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 56-58, Pl. 6, Fig. 3), the figure caption "18" in the original description refers to unfinished (and unpublished) plates.

Mitsukurinidae

Scapanorhynchus dofleini Engelhardt, 1912

Zool. Anz. 39 (21/22): 644.

Holotype (unique): ZSM [Old Collection], female, 2.10 m, [off] Mayegawa, Sagami Bay (Japan); coll. Doflein, purchased from Owston, 18.III.1903.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2); collection data restored from original description. Eschmeyer (On-Line Catalog, updated version 17. April 2006) gives 4 jaws as additional paratypes; however, these jaws are not mentioned by Engelhardt. According to Compagno (2001) a synonym of *Mitsukurina owstoni* Jordan, 1898.

Moridae

Haloporphyrus modestus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 28-29, Pl. IV, Fig. 13.

Holotype (unique): ZSM [Old Collection], 34 cm TL, "von Yokohama, coll. Haberer" [from Yokohama (Japan); coll. Haberer]; no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2). According to Nakabo (2002) valid as *Laemonema modestum* (Franz, 1910).

Mugilidae

Dajaus elongatus Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 222, Fig. 2.

Syntypes (2): ZSM Verz. Nr. 151 [old Collection], "Neu-Granada"; leg: M. Wagner, 1858-1859. ZSM Verz. Nr. 286 [Old Collection], same data.

Remarks. Both syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details). Location later corrected by Wagner (1864) to "Panama". Figure caption "2" in the original description refers to unfinished (and unpublished) plates; the species was illustrated by Kner & Steindachner later on (1864) with a new numbering on Pl. 1, Fig. 2 in a more detailed description. According to Ferraris in synonymy of *Agonostomus monticola* (Bancroft, 1834).

Mugil charlottae Steindachner, 1902

Denkschr. Akad. Wiss. Wien 72: 129-130 [41-42 as separate], Pl. IV, Figs. 2 & 2a.

Holotype (unique): ZSM [Old Collection], "20.5 cm lang", purchased from fishmarket near Guayaquil (Ecuador); leg: local fishermen, coll. Th. v. Bayern, 11.VIII. 1898.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); supplemental information on the location and collection date restored from preface of Th. v. Bayern (1902). Holotype of *Mugil charlottae* ex private Collection Therese v. Bayern. According to Thomson a synonym of *Mugil curema* Valenciennes, 1836.

Ophichthidae

Ophichthus habereri Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 13-14, Pl. III, Fig. 12.

Holotype (unique): ZSM [Old Collection], 90 cm TL, "von Yokohama, coll. Haberer" [from Yokohama (Japan), coll. Haberer]; no date.

Remarks. Described from a single specimen; holotype fixed by monotypy (ICZN Art. 73.1.2).

Parodontidae

Saccodon wagneri Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 225, Fig. 10.

Holotype (unique): ZSM Verz. No. 210, "Ecuador" [no exact location or drainage available from original description] (Ecuador); leg: M. Wagner, 1858-1859.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2), originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "10" in original description refers to unfinished (and unpublished) plates. The species was described and illustrated in more detail as *Saccodon wagneri* by Kner & Steindachner later on (1864: 31-35, Pl. 4, Fig. 2). It was hypothesised that the holotype may be available in NMW (e.g. Eschmeyer Catalog, updated On-Line version, 17. Apr. 2006); however, it is unlikely that Siebold exchanged this unique specimen to NMW. No type material of *Saccodon wagneri* is available in NMW (Wellendorf, pers. comm. Oct. 2005). The holotype was apparently destroyed in Munich in World War II.

Pempheridae

Parapriacanthus beryciformis Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 33, Pl. VI, Fig. 46.

Syntype(s ?): ZSM [Old Collection], "Japan".

Remarks. Franz (1910) did not report the number of specimens. The description, which is in the singular, contains no evidence of more than a single specimen. The existence of syntypes is assumed in accordance with Recommendation 73F (ICZN; "Avoidance of assumption of holotype"), since the number of original type specimens cannot be restored from the old ZSM inventory files (see historical review). The material of *Parapriacanthus beryciformis* was originally deposited in ZSM. Franz (1910) offers neither an exact type locality, nor any other information concerning collector/collection. Therefore, it remains unclear if the specimen(s) originally belonged to the Haberer or Doflein collection. This would at least have allowed to restrict the type locality to a more confined area in Japan. Franz (1910) gives this species as new for "Japan" in a table on page 98, so "Japan" is the only available geographical information from the original work. The location "Yokohama" available in Eschmeyer online (Updated April 5, 2005) is erroneous. Doubtfully treated as synonym *Parapriacanthus ransonneti* by Randall (1995: 244).

Percidae

Aspro apron Siebold, 1863

Die Süsswasserfische von Mitteleuropa: 55.

Holotype (unique): ZSM [Old Collection] (1), no location available; Coll. Siebold, 1854-1862.

Remarks. Siebold based his description on only one specimen: "Ich habe ein Exemplar des *Aspro vulgaris* aus der Rhone, welches ich durch den Naturalienhändler Coinde von Lyon erhalten habe" [I have one specimen of *Aspro vulgaris* from the Rhône, which I received from the natural history dealer Coinde from Lyon] (Siebold 1863: 55). This single specimen is the holotype fixed by monotypy (ICZN Art. 73.1.2). According to Kottelat (1997) a synonym of *Zingel asper* (Linnaeus, 1758).

Perca americana Schrank, 1792

Nähere Bestimmung dreier Barsch-Arten. III: 100.

Syntypes: (20) "Neuyork" "in aquis subsalinis ...; da wo frische Wasser sich in Bays oder See ergießen." [New York, in brackish water, where freshwater flows into bays or the sea]; probably collected around 20.III.1783.

Remarks. Schrank apparently based his description on a literature source ("Der nordamerikanische Bersch. Schoepf. Naturf." [The northamerican Perch]; Schoepf 1784a), which was published by Johann David Schoepf (1752-1800), a German physician who worked as a botanist and zoologist in North America. Schoepf described the species very detailed based on at least 20 specimens ("Bey wenigstens 20, die ich binnen drey Tagen vor mir hatte, ..." [From at least 20, which I have seen within three days, ...]), but did not propose a binominal name for it. From Schoepf (1784b) it can be assumed that the specimens originate "in der Gegend um Neuyork" [from the New York area], which were purchased at a local fish market in New York. There is no evidence in the original description that Schrank has seen Schoepf specimens, Schoepf material is not reported from the ZSM collection (Blass 1926).

Perca vulgaris Schrank, 1792

Nähere Bestimmung dreier Barsch-Arten. I: 99.

Syntypes (?): ZSM [Old Collection], exact location unknown; Coll. Schrank (?), no date.

Remarks. Apparently based on Schäffer (1761); if Schäffer specimens were preserved, they could be syntypes (at least the illustrated specimen, to which Schrank namely refers). Additional specimens were likely seen by Schrank; he states that "die baierischen Bürstlinge ... die Schäffers Abbildung sehr wenig an Größe übertreffen" [the Bavarian Perches barely exceed Schäffers illustrations in length], which indicates that Schrank had comparative material for his assumptions; the existence of syntypes is assumed in accordance with Recommendation 73F (ICZN; "Avoidance of assumption of holotype"). Syntypes were likely part of the Collection Schrank and housed in the early ZSM fish collection (see historical review and *Salmo saxatilis* for details). No further collecting data available in ZSM. Synonym of *Perca fluviatilis* Linnaeus 1758 (Kottelat 1997).

Pingupedidae

Neopercis decemfasciata Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 81-82, Pl. IX, Fig. 78.

Syntypes: ZSM [Old Collection] (3), "Misaki und Aburatsubo, coll. Doflein (nachts)" [Misaki and Aburatsubo (Japan), night catch; coll. Doflein, no date. ZSM [Old Collection] (6), 9-13 cm "Yokohama" (Japan); coll. Haberer, no date.

Remarks. According to Nakabo (2002) valid as **Parapercis decemfasciata** (Franz, 1910).

Poeciliidae

Xiphophorus gillii Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 224, Fig. 9.

Holotype (unique): ZSM Verz. Nr. 176, Rio Charges (Panama); leg: M. Wagner, 1858-1859.

Remarks. Explicitly based on a single specimen in the original description; holotype fixed by monotypy (ICZN Art. 73.1.2). The type of *Xiphophorus gillii* was originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "9" in original description refers to unfinished (and unpublished) plates. The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 25-28, Pl. 4, Fig. 1) based on more material. However, these specimens do not have type status, thus NMW21608-21609 are not syntypes of this species. It is unlikely that Siebold exchanged the unique holotype to NMW; type status of NMW syntypes is doubtful, needs further investigation in NMW acquisition and inventory files. The holotype was apparently destroyed in World War II in Munich. According to Lucinda (in Reis et al. 2003) valid as **Poecilia gillii** (Kner, 1863).

Potamotrygonidae

Trygon hystrix var. *ocellata* Engelhardt, 1912

Zool. Anz. v. 39 (nos. 21/22): 647-648.

Holotype (unique): ZSM [Old Collection], female, 25 cm, "Südküste von Mexiana (Süßwasser!): Brasilien [southern shores of Mexiana (Freshwater!): Brazil]"; leg (?): Lorenz Müller-Mainz, 1910.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); collection data restored from original description. According to Carvalho et al. (in Reis et al. 2003) valid as **Potamotrygon ocellata** (Engelhardt, 1912).

Rajidae

Raja brasiliensis Müller & Henle, 1841

Systematische Beschreibung der Plagiostomen: 195.

Holotype (unique): ZSM [Old Collection], length approx. 40", width 16" 6", "Brasilien".

Remarks. No additional collecting data or date available from original description. Originates probably from the Spix Collection. According to Castro-Aguirre & Pérez (1996) valid as **Rhinoptera brasiliensis** (Müller & Henle, 1841).

Salmonidae

Salmo saxatilis Schrank, 1798

Fauna Boica, Vol. 1: 320.

Syntypes (?): ZSM [Old Collection], "in kalten Waldbächen [in Baiern]" (in cool forest streams [in Bavaria]) (Germany); Coll. Schrank (?), no date.

Remarks. Schrank referred to an earlier description by Bloch (1782), but the latter did not propose a scientific name. Schrank knew this species from living or preserved specimens since in the preface he explicitly mentions that he only included species in his Fauna Boica if he either was assured of their occurrence in Bavaria from reliable sources or knew them from voucher specimens (Schrank, 1798: VII-VIII). Schrank built up his private collection for more than 20 years; Balss (1926) confirms that the Schrank collection was available in the Old Collection in ZSM and included mainly Bavarian insects and fishes. No syntypes have been found in the ZSM Collection during a type search in 2005 (D. Neumann). For the nomenclatorial and taxonomical problems see Kottelat (1997; except for incorrect restriction of type locality which is not provided by the Code in that manner).

Samaridae

Plagiopsetta glossa Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 64, Pl. VIII, Fig 58.

Holotype (unique): ZSM [Old Collection], 11 cm TL, "vor Yagoshima, 150 m Tiefe, coll. Doflein" [off Yagoshima (Japan), 150 m depth; coll. Doflein]; no date.

Remarks. Described from a single specimen, holotype fixed by monotypy (ICZN Art. 73.1.2).

Scorpaenidae

Ebosia starksi Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 72-73, Pl. IX, Fig. 69.

Syntypes: ZSM [Old Collection] (4), "von Yokohama, coll. Haberer" [from Yokohama (Japan); coll. Haberer]; no date. ZSM [Old Collection] (2), "von Misaki" [from Misaki (Japan)]; coll. Doflein, no date. ZSM [Old Collection] (1), "von Dzushi, 80 m, coll. Doflein" [from Dzushi (Japan), 80 m; coll. Doflein]; no date.

Remarks. The metre values for the Dzushi specimens refer probably to the depth in which they have been caught. According to Motomura (2004) a synonym of *Parapterois heterura* (Bleeker, 1856).

Pontinus dubius Steindachner, 1902

Denkschr. Akad. Wiss. Wien 72: 124 [as separate 36], Pl. 3, Fig. 1.

Holotype (unique): ZSM [Old Collection], "24.5 cm lang", Fishmarket in dry riverbed at Payta (Peru); local fishermen, coll. Th. v. Bayern, 23-26.IX.1898.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); supplemental information on the location and collection date taken from preface of Th. v. Bayern (1902). Holotype of *Pontinus dubius* ex private Collection Therese v. Bayern. No type of this species is known in the NMW Collection (Wellendorf, pers. comm. X.2005). Not included in earlier abstract (Steindachner 1900).

Scyliorhinidae

Pristiurus hertwigi Engelhardt, 1912

Zool. Anz. 39 (21/22): 644-645.

Syntypes: ZSM [Old Collection] (4), males, 46-50 cm, [Sagami Bay off] "Yokohama" (Japan); coll. Haberer, no date. ZSM [Old Collection] (1), female, 66 cm, [Sagami bay off] Aburatsubo (Japan); leg: "SS Zuso Maru", coll. Doflein, XI.1904.

Remarks. Collection data restored from original description, date from Doflein (1904). According to Compagno (1984) a synonym of **Parmaturus pilosus** Garman, 1906.

Serranidae

"Anthias" dofleini Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 42-43, Pl. 1.

Material: ZSM [Old Collection] (2), "Aburatsubo, Sagamibucht, ca. 15 m Tiefe" [Aburatsubo, Sagami Bay (Japan), approx. 15 m depth); coll Doflein, no date.

Remarks. Franz introduced this species as "*Serranidae* nov. spec." based on an illustration of two specimens on Pl. 1 (Franz 1910: 43) and placed this species doubtfully either in the genus *Anthias* or *Epinephelus* ("Augenscheinlich gehören sie zu den Serranidae, vielleicht Gattung *Anthias* oder *Epinephelus*, doch das ist zweifelhaft" [Apparently they belong to the Serranidae, maybe genus *Anthias* or *Epinephelus*, but this is doubtful]). Consequently, the species name *dofleini* is unavailable from Franz (1910), because it was not published in unambiguous combination with a generic name (Art. 11.9.3 ICZN). Furthermore, Franz proposed the new species name for future use only ("Wir wollen für später den Speziesnamen dofleini vorschlagen." [For later, we wish to propose the species name dofleini]). Thus the name is unavailable from Franz (1910) due to Art 11.5 (ICZN) as well. No subsequent work is known to have made the name dofleini available.

Anthias elongatus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 39, Pl. VI, Fig 51.

Syntypes: ZSM [Old Collection] (31), 6.5-13 cm TL, "Yokohama; coll. Haberer"; no date.

Remarks. According to Nakabo valid as **Pseudanthias elongatus** (Franz, 1910).

Anthias gracilis Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 38-39, Pl. VI, Fig 47.

Syntypes: ZSM [Old Collection] (3), "ca. 8 cm Länge" [approx. 8 cm TL], "Dzushi, 80 m Tiefe, coll. Doflein" [Dzushi (Japan), caught from 80 m depth; coll. Doflein]; no date.

Anthias nobilis Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 38, Pl. VI, Fig. 44.

Syntypes: ZSM [Old Collection] (3), "Misaki" (Japan); "coll. Doflein"; no date.

Remarks. According to Randall & Pyle (2001) valid as **Pseudanthias nobilis** (Franz, 1910).

Epinephelus doederleinii Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 35-36.

Syntypes (8): ZSM [Old Collection] "Yokohama, coll. Haberer" [Yokohama (Japan); coll. Haberer]; no date. ZSM [Old Collection], "Dzushi, coll. Doflein" [Dzushi (Japan); coll. Doflein]; no date.

Remarks. Originally as *Epinephelus döderleinii*; change of spelling mandatory (Art 32.5.2.1 ICZN). Franz gives a total number of 8 specimens ranging from 2.6-20 cm TL, which were probably stored in two different lots. According to Randall & Heemstra (1991) a synonym of *Epinephelus radiatus* (Day, 1868).

Serranus huascarii Steindachner, 1900

Anz. Akad. Wiss. Wien 37 (18): 208.

Holotype (unique): ZSM [Old Collection], "19.5 cm lang", Fishmarket in dry riverbed in Payta (Peru); local fishermen; coll. Th. v. Bayern, 23-26.IX.1898.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); additional information on the location and collection date restored from preface of Th. v. Bayern (1902). Holotype of *Serranus huascarii* ex private Collection Therese v. Bayern. No type of this species is known in the NMW Collection (Wellendorf, pers. comm. X.2205). Species illustrated and described in more detail in Steindachner 1902:112, Pl. 1 (fig. 1).

Synaphobranchidae

Simenchelys dofleini Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 10, Pl. 3 Figs. 1-2.

Syntypes: ZSM [Old Collection] (1), 46.0 cm TL, "Sagamibucht, coll. Doflein." [Sagami Bay, coll. Doflein]. ZSM [Old Collection] (3), 9.5, 11.0 and 18.0 cm TL, "Misaki, durch Fischer Kuma (coll. Doflein)" [Misaki (Japan), leg: fisherman Kuma, coll. Doflein].

Remarks. No collection date given in original description. According to Castle (in Quero et al. 1990) a synonym of *Simenchelys parasitica* Gill, 1879.

Synbranchidae

Cryptophthalmus robustus Franz, 1910

Abh. Akad. Wiss. München Math.-Phys. Kl. 4 (Suppl. 1): 15, Pl. III, Fig. 11.

Syntypes: ZSM [Old Collection] (8), 21-53 cm TL, "von Yokohama, coll. Haberer" [from Yokohama (Japan), coll. Haberer]; no date.

Remarks. According to Okada (1961: 718) a synonym of *Fluta alba* (Zuiew, 1793); valid as *Monopterus albus* (Zuiew, 1793).

Telmatherinidae

Paratherina cyanea Aurich, 1935

Zool. Anz., 112 (7/8): 175-177, Figs. 7C, 9.

Syntypes: ZSM [Old Collection] (5), 124-155 mm TL, "Towoeti-See" [Lake Towuti], Sulawesi (Indonesia); leg: R. Woltereck, X.1932.

Remarks. Collection data restored from Woltereck (1933).

Paratherina labiosa Aurich, 1935

Zool. Anz., 112 (7/8): 172-173, Figs. 6A, 7A.

Holotype (unique): ZSM [Old Collection], 103 mm TL, "Wawontoa-See" [Lake Wawontoa], Sulawesi (Indonesia); leg: R. Woltereck, X.1932.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); collection data restored from Woltereck (1933).

Paratherina striata Aurich, 1935

Zool. Anz., 112 (7/8): 173-175, Figs. 7C, 8.

Syntypes: ZSM [Old Collection] (2), "Towoeti-See" [Lake Towuti], 122 mm TL and "Wawontoa-See" [Lake Wawontoa], 142 mm TL, Sulawesi (Indonesia); leg: R. Woltereck, X.1932.

Remarks. Collection data restored from Woltereck (1933).

Torpedinidae

Torpedo zugmayeri Engelhardt, 1912

Zool. Anz. 39 (21/22): 647.

Holotype (unique): ZSM [Old Collection], female, 33 cm, "Gwadar" Prov. of Baluchistan] (Islamic Republic of Pakistan); leg: local fishermen, purchased from local fishmarket by E. Zugmayer, II-V.1911.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); collection data restored from original description.

Trichomycteridae

Pygidium quechuorum Steindachner, 1900

Anz. Akad. Wiss. Wien 37 (18): 207.

Syntypes: ZSM [Old Collection] (5), "5.1-6.4 cm lang", Rio Chili near Arequipa (Peru); leg: local Cholo-boy, coll. Th. v. Bayern, 28.XI.1898.

Remarks. Originally published as above, but changed to "*Pygidium* (*Trychomycterus* Val.) *quechuorum* nob." when illustrated and described in more detail in Steindachner (1902: Pl. IV, Figs. 3 & 3a). Additional information on the type locality and the curious circumstances of the collecting of the syntypes are available from the preface of Th. v. Bayern (1902): "So richtete ich einem Choloknaben mittels einer leeren Weißweinflasche eine Art primitiver Fischreuse zurecht und schickte ihn im Rio Chili sein Glück zu versuchen. Mit einer neuen Welsart ... kehrte er von seiner Sendung zurück." [Using an empty white wine bottle I prepared a simple kind of fish trap for a Cholo boy and sent him to the Rio Chili to try his luck. With a new silurid species ... he returned from his mission]. Holotype of *Pygidium quechuorum* ex private Collection Therese v. Bayern. No duplicates of the original syntype series are known in NMW (Wellendorf, pers. comm. X. 2005). According to de Pinna & Wosiacki (in Reis et al. 2003) a synonym of *Trichomycterus rivulatus* Valenciennes, 1846.

Trichomycterus laticeps Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 228, Fig. 17.

Syntypes (2): ZSM Verz. No. 181, 289 [Old Collection], "Westabhange der Andes" [western slopes of the Andes] (Ecuador]; leg: M. Wagner, 1858-1859.

Remarks. Both syntypes were originally deposited in ZSM (Wagner 1864; see historical review for details); none of them is available in NMW (Wellendorf, pers. com. Oct. 2005). The figure caption "17" in the original description refers to unfinished (and unpublished) plates; the species was described in more detail by Kner & Steindachner later on (1864) and illustrated with a new numbering on Pl. 6, Figs. 1a & 2. According to the annotation by Kner & Steindachner later on (1864: 54) Fig. 1a shows the ventral view of *T. laticeps*; the inscription on Pl. 6 is obviously wrong. According to de Pinna & Wosiacki (in Reis et al. 2003) valid as **Ituglanis laticeps** (Kner, 1863).

Trichomycterus taenia Kner, 1863

Sitzungsber. Königl. Bayer. Akad. Wiss. München 2: 228, Fig. 16.

Holotype (unique): ZSM Verz. No. 237 [Old Collection], "Westabhange der Andes" [western slopes of the Andes] (Ecuador]; leg: M. Wagner, 1858-1859.

Remarks. Holotype fixed by monotypy (ICZN Art. 73.1.2); originally deposited in ZSM (Wagner 1864; see historical review for details). Figure caption "16" in original description refers to unfinished (and unpublished) plates. It is unlikely that Siebold exchanged this specimen to NMW; it is not listed in the acquisition files of NMW (Akquisitionsbogen 1864.VII.11), no type material of *Trichomycterus taenia* is available in NMW (Wellendorf, pers. comm. Oct. 2005). The species was described and illustrated in more detail by Kner & Steindachner later on (1864: 52-54, Pl. 4, Fig. 1; the inscription "*T. taenia*" for figure 1a on plate 6 is erroneous – see *T. laticeps* for details).

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References

Anonymous. No year. Dr. Haberers ostasiatische Sammlungen

Amaoka, K., E. Mihara & J. Rivaton 1997. Pisces, Pleuronectiformes: flatfishes from the waters around New Caledonia. Six species of the bothid genera *Tosarhombus* and *Parabothus*. – Mem. Mus. Nat. hist. Nat. NS A) **174**: 143-171

Aurich, H. J. 1938. Mitteilung XXVIII der Wallacea-Expedition Woltereck: Die Gobiiden (Ordnung: Gobioidea). – Intern. Rev. ges. Hydrobiol. Hydrograph. **38** (1/2): 125-183

Balss, H. 1926. Die Zoologische Staatssammlung und das Zoologische Institut. In: Müller, K. A. von: Die wissenschaftlichen Anstalten der Ludwigs-Maximilians University zu München. – Chronik zur Jahrhundertfeier, im Auftrag des Akademischen Senats herausgegeben: 300-315

Bayern, Prinzessin Therese von. 1895. In: Steindachner, F. Über einige Fischarten Mexiko's und die Seen, in welche sie vorkommen, – Anz. Akad. Wiss. Wien **32** (17): 516-530 [1-14 as separate], Plts 1-3

– – 1902. In: Steindachner, F. Herpetologische und ichtyologische Ergebnisse einer Reise nach Südamerika. – Denkschrift. Math.-Naturwiss. Cl. kaiserl. Akad. Wiss. Wien **72**: 89-95 [1-7 as separate]

Bloch, M. E. 1782. Oeconomische Naturgeschichte der Fische Deutschlands. – Berlin. Vol. **1**.

Burgess, W. E. 1978. Butterflyfishes of the world. A monograph of the family Chaetodontidae. – T. F. H. Publ., Neptune City, New Jersey: 1-832

Castro-Aguirre, J. L. & H. Espinosa Pérez 1996. Listados faunísticos de México. VII. Catálogo sistemático de las rayas y especies afines de México. (Chondrichthyes: Elasmobranchii: Rajiformes: Batoideiomorpha). – List Fauna Mexico **VII**: 7-75

Coad, B. W. 1996. Freshwater fishes of Iranian and Pakistani Baluchistan. – Biologia (Lahore) **42** (1-2): 1-18

Cohen, D. M., T. Inada, T. Iwamoto & N. Scialabba 1990. FAO species catalogue, Vol. 10. Gadiform fishes of the world (order Gadiformes). An annotated and illustrated catalogue of cods, hakes, grenadiers and other gadiform fishes known to date. – FAO Fisheries Synopsis **125** (10): 1-442

Compagno, L. 1984. FAO species catalogue, Vol 4. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Hexanchiformes to Lamniformes (Part 1). – FAO Fisheries Synopsis **125** (4): 1-249

– – 2001. Sharks of the world. An annotated and illustrated catalogue of shark species known to date. Volume 2. Bullhead, mackerel and carpet sharks (Heterodontiformes, Lamniformes and Orectolobiformes). – FAO Species Catalogue for Fishery Purposes: 1-269

Doflein, F. 1904. Beiträge zur Naturgeschichte Ostasiens. – Abh. II. Kl. Königl. Akad. Wiss., Suppl. Bd. **I**: 1-7, 2 maps

– – 1905. Die Tiefseefauna der Sagamibucht. – Mitt. Dt. Ges. Natur- Völkerkunde Ostasiens **X** (part 2). Hobunsha, Tokyo

Engelhardt, R. 1912. Über einige neue Selachier-Formen. – Zool. Anz. **39** (21/22): 643-648

Ege, V. 1939. A revision of the genus *Anguilla* Shaw; A systematic, phylogenetic and geographical study. – Dana Report No. **16**: 1-256

Eschmeyer, W. N. 1997. A new species of Dactylopteridae (Pisces) from the Philippines and Australia, with a brief synopsis of the family. – Bull. Marine Sci. **60** (3): 727-738

Franz, V. 1910. Die Japanischen Knochenfische der Sammlungen Haberer und Doflein. (Beiträge zur Naturgeschichte Ostasiens.). – Abh. Akad. Wiss. München, Math.-Physikal. Kl. **4** (Suppl. 1): 1-135, Pls. 1-11

Freyhof, J. 2005 Redescription of *Coregonus bavaricus* Hofer, 1909 from Lake Ammersee, Bavaria (Salmoniformes: Coregonidae). – Cybium **29** (2): 179-183

Fricke, R. 1991. Types and Historical Materials in the Fish Collection of the Staatliches Museum für Naturkunde in Stuttgart. Part 1. The Bleeker Collection. – Stuttgarter Beitr. Naturkde. (Ser. A) **471**: 1-85

Gilbert, C. R. 1998. Type catalog of Recent and fossil North American Freshwater fishes: families Cyprinidae, Catostomidae, Ictaluridae, Centrarchidae and Elassomatidae. – Florida Mus. Nat. Hist., Spec. Publ. No. **1**: 1-284

Gruber, U. 1992. Die Sektion Fische der Zoologischen Staatsammlung München. In: Diller, E. & A. Hausmann (eds.). Chronik der Zoologischen Staatssammlung. Festschrift zur Verabschiedung des Direktors der Zoologischen Staatsammlung München, Prof. Dr. Ernst Fittkau. – Spixiana Suppl. **17**: 124

Huber, W. 1998. Münchener Naturforscher in Südamerika. – Ber. Freunde ZSM **1**. Verlag F. Pfeil, München: 1-168

Ikeda, Y., T. Nakabo & W. Hiramatsu 1995. Redescription of *Vanderhorstia macropteryx* (Perciformes: Gobiidae) with designation of a neotype. – Japan. Journ. Ichthyol.**42** (3/4): 303-310

Kailola, P. J. 2004. A phylogenetic exploration of the catfish family Ariidae (Otophysi: Siluriformes). – The Beagle, Rec. Mus. Art Gall. Northern Territory, Darwin **20**: 87-166

Kner, R. 1863. Eine Übersicht der ichthyologischen Ausbeute des Herrn Professors Dr. Mor. Wagner in Central-Amerika. – Sitz.ber. königl. bayer. Akad. Wiss. München **2** (2): 220-230

– – & F. Steindachner 1864. Neue Gattungen und Arten von Fischen aus Central-Amerika; gesammelt von Prof. Moritz Wagner, beschrieben von Prof. Rudolf Kner und Dr. Franz Steindachner, Assitenten am kaiserl. Hof-Naturalienkabinete in Wien. – Abh. königl. bayer. Akad. Wiss., II. Cl., **10** (I. Abtheilung): 1-61, Tabs. I-VI

Kottelat, M. 1988. Authorship, dates of publication, status and types of Spix and Agassiz's Brasilian fishes. – Spixiana **11** (1): 69-93

-- 1997. European freshwater fishes. – Biologia Bratislava **52** (suppl. 5): 1-271
Kraft, R. & W. Huber 1992. Die Zoologische Schausammlung in der Alten Akademie in München 1809-1944. – In: Diller, E. & A. Hausmann (eds.). Chronik der Zoologischen Staatssammlung. Festschrift zur Verabschiedung des Direktors der Zoologischen Staatsammlung München, Prof. Dr. Ernst Fittkau. – Spixiana Suppl. **17**: 1-248
Kullander, S. O., F. Fang, B. Delling & E. Åhlander 1999. The fishes of the Kashmir Valley. In: Nyman, L. (ed). River Jhelum, Kashmir Valley. Impacts on the aquatic environment. – Swedmar, Göteborg: 99-167
Lachner, E. A. 1973 Echeneididae. – In: Hureau & Monod 1973: Check-list of the fishes of the north-eastern Atlantic and of the Mediterranean (CLOFNAM) Vol. **1**: 637-640
Li, S.-Z. & H.-M. Wang 2000 Fauna Sinica. Osteichthyes. Pleuronectiformes. – Science Press, Beijing. 1-433
Lindberg, G. U. & Z. J. Krasyukova 1975. Fishes of the Sea of Japan and adjacent territories of the Okhotsk and Yellow Sea. – Fish Sea Japan **4**: 1-463
Mauermayer, G. 1986 (?). Chronik der Zoologischen Staatssammlung München. – Unpublished manuscript, 16 p.
Miller, R. R. 2005. Freshwater Fishes of México. – Univ. Chicago Press, Chicago: 1-490
Mirza, M. R. 2003. Checklist of freshwater fishes of Pakistan. – Pakistan J. Zool. **3**: 1-30
Motomura, H. 2004. Morphological comparison of a poorly known scorpionfish, *Parapterois macrura*, with a related species, *P. heterura* (Scorpaenidae: Pteroinae). – Zool. Stud. **43** (1): 1-7
Murdy, E. O. & K. Shibukawa A revision of the Indo-Pacific fish genus *Caragobius* (Gobiidae: Amblyopinae). – Zootaxa **301**: 1-12
Nakabo, T. 2002 (Ed.). Fishes of Japan with pictorial keys to the species, English edition. – Tokai University Press: 1-866
Nemeth, D. 1994. Systematics and distribution of fishes of the family Champsodontidae (Teleostei: Perciformes), with descriptions of three new species. – Copeia 1994 (2): 347-371
Okada, Y. 1961. Studies on the freshwater fishes of Japan. – Prefectural University of Mei, Tsu, Mie Prefecture, Japan. Freshwater Fish. Japan: 1-860
Quéro, J.-C., J.-C. Hureau, C. Karrer, A. Post & L. Saldanha 1990. Check-list of the fishes of the eastern tropical Atlantic (CLOFETA). – Paris, Unesco: 1-1492
Randall, J. E. 1995. Coastal fishes of Oman. – Crowford House Publ. Pty Ltd, Bathurst, Australia: 1-439
-- & P. C. Heemstra 1991. Revision of Indo-Pacific groupers (Perciformes: Serranidae: Epinephelinae), with descriptions of five new species. – Indo-Pacific Fishes **20**: 1-332
-- and R. L. Pyle 2001. Four new serranid fishes of the anthiine genus *Pseudanthias* from the South Pacific. – Raffles Bull. Zool. **49** (1): 19-34
Reis, R. E., S. O. Kullander & C. J. Ferraris, Jr. 2003. Check list of the freshwater fishes of South and Central America (CLOFFSCA). – EDIPUCRS, Porto Alegre (Brazil): 1-729
-- & E. H. L. Pereira 2000. Three new species of the loricariid catfish genus *Loricariichthys* (Teleostei: Siluriformes) from southern South America. – Copeia 2000 (4): 1029-1047
Schäffer, J. C. 1761. Piscium Bavarico-Ratisbonensium pentas. 1-82.
Schrank, F. von Paula 1783. XXVII. Kurze Nachrichten und Auszüge aus Briefen unserer auswärtigen gelehrten Freunde; 9. Auszüge aus den Briefen an den Herrn Bloch von Herrn von Paula Schrank und Herrn D. Wartmann. – Schr. Berlin. Ges. Naturforsch. Freunde. Fr. (4): 427-429
-- 1792. Nähere Bestimmung dreier Barscharten. – Abh. Privatges. Naturforsch. Oekonom. Oberdeutschland **1**: 98-103
Schoepf, J. D. 1784a. Der nord-amerikanische Pertsch. – Der Naturforscher **20**: 17-25. Halle
-- 1784b. Der gemeine Hecht in Amerika. – Der Naturforscher **20**: 26-31. Halle
Shibukawa, K. & T. Suzuki 2004. *Vanderhorstia papilio*, a new shrimp-associated goby from the Ryukyu Islands, Japan (Perciformes: Gobiidae: Gobiinae), with comments on the limits of the genus. – Ichthyolog. Res. **51** (2): 113-119
Siebold, C. Th. E. von. 1863. Die Süsswasserfische von Mitteleuropa. – Wilhelm Engelmann, Leipzig; 1-430
Steindachner, F. 1894. Vorläufige Mittheilung über einige neue Fischarten aus den Seen von Mexico. – Anz. Akad. Wiss. Wien **31** (15): 147-149
-- 1895. Über einige Fischarten Mexiko's und die Seen, in welche sie vorkommen. – Anz. Akad. Wiss. Wien **32** (17): 516-530 [1-14 as separate], Plts 1-3
-- 1900. Erstattungen eines vorläufigen Berichtes über einige von Ihrer königlichen Hoheit Frau Prinzessin Therese von Bayeren während einer Reise nach Südamerika 1898 gesammelte neue Fischarten. – Anz. Akad. Wiss. Wien **37** (18): 206-208
-- 1902. Herpetologische und ichtyologische Ergebnisse einer Reise nach Südamerika, mit einer Einleitung von Therese Prinzessin von Bayern. – Denkschr. Math.-Naturwiss. Cl. kaiserl. Akad. Wiss. Wien **72**: 95-148 [7-60 as separate], Tabs. 1-5
Springer, V. G. & M. F. Gomon 1975. Revision of the blenniid fish genus *Omobranchus* with descriptions of three new species and notes on other species of the tribe Omobranchini. – Smithson. Contr. Zool. **177**: 1-135
Terofal, F. 1983. Die Fischausbeute der Brasilien-Expedition 1817-1820 von J. B. v. Spix und C. F. V. Martius. – Spixiana Suppl. **9**: 35-42
Thomson, J. M. 1997. The Mugilidae of the World. – Mem. Queensland Mus **41** (3): 457-562
Vogt, C. & B. Hofer 1909. Die Süsswasserfische von Mittel-Europa. – Engelmann, Leipzig: 1-558
Wagner, M. 1864. Ueber die hydrographischen Verhältnisse und das Vorkommen der Süsswasserfische in

den Staaten Panama und Ecuador. – Abh. königl. bayer. Akad. Wiss., II. Cl. **10** (I. Abtheilung): 67-113 [1-49 as separate]

– – 1870. Naturwissenschaftliche Reisen im tropischen Amerika. – Cotta, Stuttgart

Whitehead, P. J. P. 1970. The clupeoid fishes described by Steindachner. – Bull. British Mus. (Nat. Hist.) Zool. **20** (1): 1-46

– – , G. J. Nelson & T. Wongratana 1988. FAO species catalogue, Vol. 7. Clupeoid fishes of the world (Suborder Clupeoidei). An annotated and illustrated catalogue of the herrings, sardines, pilchards, sprats, anchovies and wolf-herrings. Part 2. Engraulididae. – FAO Fisheries Synopsis No. **125** (7): 305-579

Woltereck, R. 1933. Meine Forschungsreise nach Amerika und Ostasien zum Studium insulärer und lakustriner Endemismen. – Intern. Rev. Ges. Hydrobiol. **28**: 338-349

Wu, W. (ed.) The cyprinid fishes of China (Vol. 1) [In Chinese]. – Science Press, Shanghai: 137-197

Yue, P.-Q. 2000 (Chief Editor). Fauna Sinica. Osteichthyes. Cypriniformes III. – Science Press, Beijing: 1-661

Zugmayer, E. 1909a. Desription of Four new Cyprinoid Fishes from High Asia. – Ann. Mag. Nat. Hist. (London) (Ser. 8) **4** (23): 432-435

– – 1909b. Bericht über eine Reise in Westtibet. – Geogr. Mitt. **7**: 145-151, 2 maps

– – 1910. Beiträge zur Ichthyologie von Zentral-Asien. – Zool. Jb. **29** (3/4): 275-298, Tab. 12, Figs. 1-4

– – 1912a. On a new genus of cyprinoid fishes from high Asia. – Ann. Mag. Nat. Hist. (London) (Ser. 8) **9** (54): 682

– – 1912b. Eight new fishes from Baluchistan. – Ann. Mag. Nat. Hist. (London) (Ser. 8) **10** (60): 595-599

– – 1913a. Wissenschaftliche Ergebnisse der Reise von Prof. Dr. G. Merzbacher im zentralen und östlichen Thian-Schan 1907/8. II. Fische. – Abh. königl. bayer. Akad. Wiss. (math-physikal. Kl.): **26** (4): 1-18

– – 1913b. Die Fische von Balutschistan. – Abh. königl. bayer. Akad. Wiss. (math-physikal. Kl.) **26** (6): 1-35

Internet base information

Eschmeyer, W. 2005. Catalog of Fishes. – On-Line Version (updated 17 April 2006): http://www.calacademy.org/research/ichthyology/catalog/fishcatsearch.html

Higuchi, H. 1992. An updated list of ichthyological collecting stations of the Thayer Expedition to Brazil. – On-Line Version (1996): http://www.mcz.harvard.edu/Departments/Fish/thay_sta.htm

International Commission on Zoological Nomenclature online: http://www.iczn.org/iczn/index.jsp

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Editorial

Infolge der zunehmenden Ressourcenknappheit der Zoologischen Staatssammlung München sieht sich der Herausgeber der SPIXIANA gezwungen, mit dem ersten Heft des Jahrganges 30/2007 einige Änderungen einzuführen:

1. Es werden nicht mehr wie bisher drei Hefte jährlich publiziert, sondern nur mehr zwei. Jedoch bleibt der Gesamtumfang von jährlich 288 Seiten erhalten, so daß die einzelnen Hefte je 144 Seiten umfassen werden. Die Publikationsdaten werden in Zukunft der 1.5. bzw. der 1.11. jeden Jahres sein. Diese Maßnahme dient der Ersparnis sowohl bei der Produktion als auch beim Versand.

2. Jeder Autoren erhält eine PDF-Datei des eigenen Artikels. Sonderdrucke werden wie bisher nur auf ausdrückliche Bestellung beim Verlag und zu den vom Verlag erhobenen Konditionen und Kosten hergestellt.

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4. Farbabbildungen müssen in voller Höhe vom Autor des jeweiligen Artikels übernommen werden.

5. Das Heft 1 des Jahrganges 30/2007 wird überarbeitete Autorenrichtlinien enthalten. Bis dahin werden Autoren gebeten, sich an die bisherigen Richtlinien zu halten, jedoch unter den o.g. Einschränkungen.

Der Herausgeber

Editorial

Due to recent cuts of our budget the editor of SPIXIANA is compelled to introduce some modifications concerning the publication of the journal, beginning from the first issue of volume 30/2007.

1. To reduce the costs for printing, postage, and shipping, beginning with the first issue of 2007 only two issues will be published per year while maintaining the annual page size of 288 pages. The two issues with 144 pages each will be published on the first of May and first of November.

2. Every corresponding author will receive a pdf file of the final article. Paper offprints will only be produced on special request and will have to be purchased by the author.

3. Manuscripts and illustrations should be submitted electronically (CD or DVD). Authors will be charged if illustrations are submitted as printed copy or if they require extensive subsequent editing.

4. Authors will have to pay the full cost for the reproduction of colour artwork.

5. Revised instructions for authors will be provided with the first issue of volume 30/2007. In the meantime authors are requested to follow the current instructions, with the restrictions mentioned above.

The Editor

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SPIXIANA bringt Originalarbeiten aus dem Gesamtgebiet der Zoologischen Systematik mit Schwerpunkten in Morphologie, Phylogenie, Tiergeographie und Ökologie. Manuskripte werden in Deutsch, Englisch oder Französisch angenommen. Pro Jahr erscheint ein Band zu drei Heften. Umfangreiche Beiträge können in Supplementbänden herausgegeben werden.

Ein Jahresabonnement kostet € 60. Supplementbände werden gesondert nach Umfang berechnet. Mitglieder der "Freunde der Zoologischen Staatssammlung München" können die Zeitschrift zum ermäßigten Preis von € 25,50 beziehen.

SPIXIANA publishes original papers on Zoological Systematics, with emphasis on Morphology, Phylogeny, Zoogeography and Ecology. Manuscripts will be accepted in German, English or French. A volume of three issues will be published annually. Extensive contributions may be edited in supplement volumes.

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