

THE REPTILES  
OF THE  
INDO-AUSTRALIAN  
ARCHIPELAGO

I



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THE REPTILES  
OF THE  
INDO-AUSTRALIAN ARCHIPELAGO.





THE REPTILES  
OF THE  
INDO-AUSTRALIAN ARCHIPELAGO

I

LACERTILIA, CHELONIA,  
EMYDOSAURIA

with 132 illustrations

BY

**Dr. NELLY DE ROOIJ**

Curator of the Zoological Museum, Amsterdam



LEIDEN — 1915.  
E. J. BRILL Ltd.



## PREFACE.

Since long a work on the vertebrate fauna of Dutch East India has been wished for by many.

The credit of first planning the publishing of such a work is due to the Koninklijke Natuurkundige Vereeniging in Nederlandsch Indië.

But we are under deepest obligation to Prof. M. TREUB, the never to be forgotten director of 's Lands Plantentuin at Buitenzorg, who was able to obtain in 1909 as head of the department of agriculture, governmental aid for the publication of a work on the fishes of the Indo-Australian Archipelago. Two volumes of this ichthyological series have already appeared, while a third volume is in preparation.

With these volumes the foundation was laid for a faunistic work of wider scope.

Our recognition of indebtedness has to include Dr. J. C. KONINGSBERGER, director of 's Lands Plantentuin at Buitenzorg, who, like his predecessor is very much interested in the continuation of the series of volumes on the vertebrate fauna of the Indo-Australian Archipelago. He managed in 1912 to get the aid of the government for the publication of a work on the Reptilia of the Indo-Australian Archipelago.

The undersigned was trusted with the arrangement of the work, whilst Miss NELLY DE ROOIJ, Phil. Dr. was willing to undertake the heavy task of writing the book. She certainly was entirely qualified for this labour, for during the years, that she was assistent at the Zoological Museum of Amsterdam, she occupied herself specially with the study of Reptilia and reported on the herpetological material of various expeditions to different parts of the Archipelago.

It proved to be desirable, on account of the extensiveness of the material, to divide the work on the Reptilia in two volumes. The first volume, which is hereby offered to those,

that are interested in this branch of science, contains the description of 306 species, i. e. 267 Lizards, 35 Chelonians and 4 Crocodiles. It is illustrated with 132 figures by Mr. J. F. OBBES, whose skilful hand and keen sight are able to combine artisticity with absolute faithfulness to nature.

The next volume will contain the description of the snakes.

In conclusion I desire to express our sincere thanks to the publisher Late E. J. BRILL, Leyden, for the unremitting care he has bestowed on this volume.

Prof. MAX WEBER  
Director of the Zoological Museum of  
the University of Amsterdam.

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## INTRODUCTION.

This work contains descriptions of all the reptiles that have been recorded from the islands of the Indo-Australian Archipelago, generally known as the Dutch East-Indies, a region, containing all the islands between Sumatra westwards and New Guinea eastwards and including the whole of Borneo, Timor and New Guinea, part of which islands politically belong to other states. Besides, I added a few species from some of the smaller islands eastwards of New Guinea. These species are up till now not yet known from the mainland of this large island, but it is allowed to suppose that they may be found there in a near future, as some other species have already proved to do.

As a rule the classification used by G. A. BOULENGER in his Catalogues of the Reptiles in the British Museum has been followed here. This author gives complete lists of synonyms, so that it seemed sufficient to me to quote the name of every species, by which it has first been described, followed by the one, used by BOULENGER and which has been accepted by the greater part of the herpetologists.

At the end of each diagnosis follows the largest known length in millimeters of the species; length of head and body means the distance between the tip of the snout and the vent. A species examined by myself has been indicated by a! behind the name of the locality where it was found.

A great deal of the described reptiles were examined and compared by me with the existing descriptions in the Amsterdam Museum, which possesses collections from all the different parts of the Indo-Australian Archipelago. The most interesting of these have been named separately here with the names of the collectors:

from *Simalur*, by Mr. E. JACOBSON;

from *Nias*, by Dr. J. P. KLEIWEG DE ZWAAN;

from *Sumatra*, by Prof. MAX WEBER, Dr. L. P. DE BUSSY,

Dr. J. P. KLEIWEG DE ZWAAN, Mr. P. E. MOOLENBURGH,  
Mr. F. K. VAN DEDEM, Dr. A. J. SALM;

from *Borneo*, by Dr. H. A. LORENTZ;

from *Java*, by Prof. MAX WEBER, Mr. J. HUYSMANS, Mr.  
E. JACOBSON, Dr. DAN. DE LANGE, Dr. P. BUITENDIJK, Mr.  
H. A. WOLFF, Mr. W. C. VAN HEURN;

from the *Lesser Sunda Islands*, by Prof. MAX WEBER, the  
late Dr. G. A. J. VAN DER SANDE;

from *Celebes*, by Prof. MAX WEBER, Mr. A. C. KRUYT, Mr.  
E. C. ABENDANON;

from the *Moluccas*, by Dr. L. F. DE BEAUFORT, Mr. F. K.  
VAN DEDEM;

from *Waigeu*, by Dr. L. F. DE BEAUFORT;

from *New Guinea*, by 6 different Dutch New Guinea Expe-  
ditions between the years 1903—1912;

from different small groups of islands, by the Siboga Expe-  
dition. Moreover I could dispose of the specimens, belonging  
to the collections of the Royal Zoological Society „Natura  
Artis Magistra” of Amsterdam.

Other species, not represented in the Amsterdam Museum,  
could be examined, partly by visiting other Museums, partly  
by loan. I wish to express my sincere thanks to Dr. VAN  
LIDTH DE JEUDE of the Leyden Museum, to Prof. ROULE and  
to Dr. DESPAX of the Paris Museum, to Dr. BOULENGER of  
the British Museum, who were kind enough to allow me to  
study the interesting and often rare forms in the collections  
of these Museums, and I am also greatly indebted to Dr.  
ANNANDALE of the Indian Museum at Calcutta, Dr. STERN-  
FELD of the Senckenberg Museum at Francfort and Dr.  
BAUMANN of the Bern Museum, who were so good as to send  
specimens for examination.

I had the great advantage to obtain the help of the well  
known artist Mr. J. F. OBBES, which has enabled me to give  
a figure of nearly every genus treated in the following pages.

Finally I am glad of having an opportunity to thank Prof.  
MAX WEBER for his valuable advice and kind help concerning  
a great many questions.

Amsterdam, February 1915.

NELLY DE ROOY.

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# REPTILIA.

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This class of Vertebrates is divided into a number of orders, recent as well as extinct. The four recent ones are represented in the Indo-Australian Archipelago:

- I. Lacertilia,
- II. Chelonia,
- III. Emydosauria,
- IV. Ophidia.

This volume deals with the three first-mentioned orders.

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## I. Order LACERTILIA.

Quadrate bone articulated to the skull, distally free; temporal region without or with one temporal arch; the two parts of the mandible united by suture; teeth not in alveoli. Anal opening transverse; copulatory organ present, paired.

The true lizards, chamaeleons not occurring in the Indo-Australian Archipelago, have the pterygoid in contact with the quadrate; a pectoral arch or an indication of it is present; clavicle present, when the limbs are developed. The tongue is flattened. They may be divided into 20 families, 9 of which are represented in the Indo-Australian fauna.

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### Synopsis of families.

- .1. Tongue smooth or with long papillae.
  - a. Head covered above with granules or small scales.
    - 1. Body depressed, covered with small granules or scales. Pleurodont; tongue short, feebly bifid anteriorly (fig. 1. 1). . . . . *Geckonidae*, p. 3.
    - 2. Body vermiform, covered with imbricate scales. Pleurodont; tongue feebly bifid anteriorly (fig. 1. 2) *Pygopodidae*, p. 62.

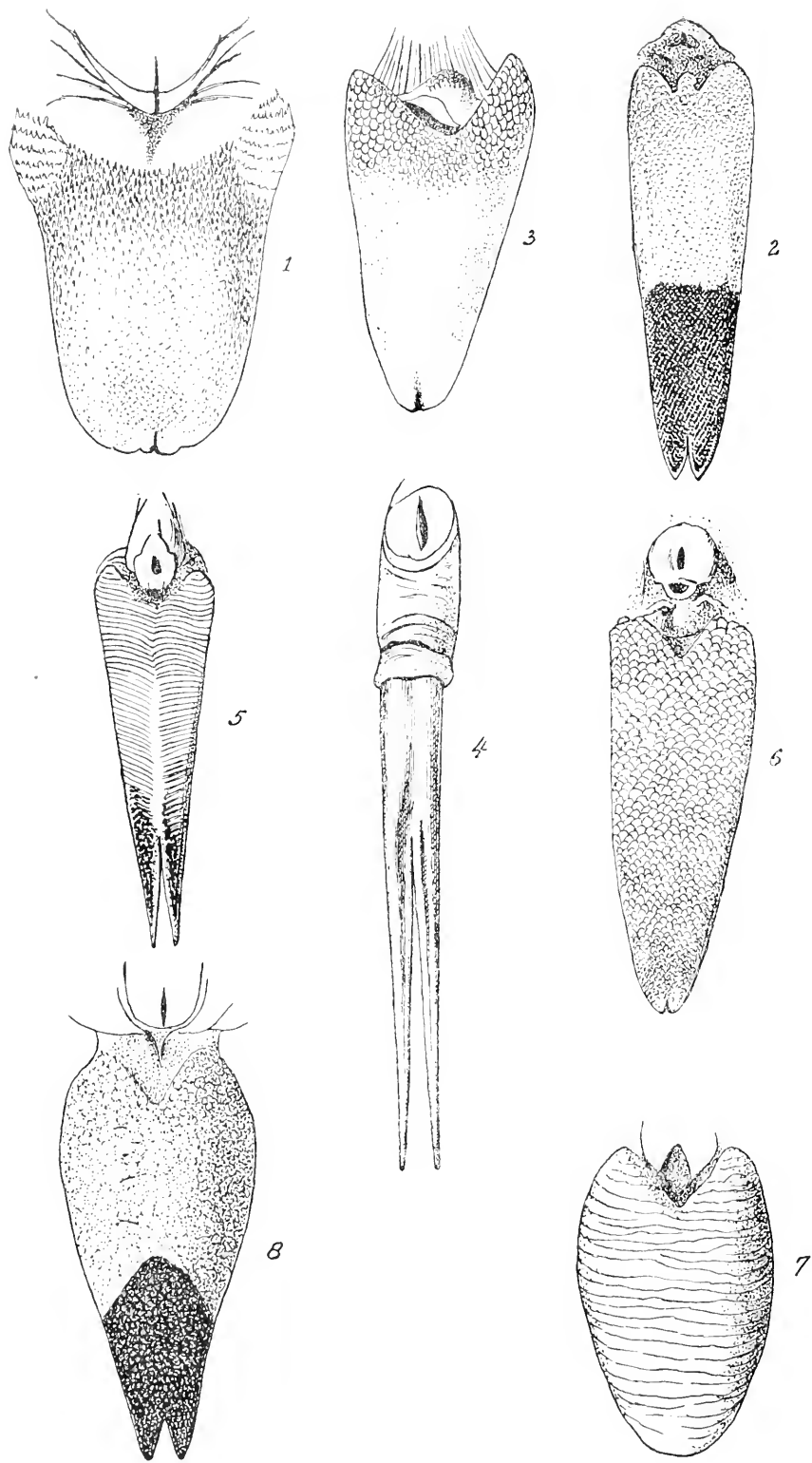


Fig. 1. Tongues.

1. *Gekko monarchus* (D. B.)  $\times 6$ ; 2. *Varanus salvator* (Laur.)  $\times 3$ ;  
 3. *Gonyoccephalus auritus* Meyer  $\times 3$ ; 4. *Liailis burtoni* Gray  $\times 7$ ;  
 5. *Tachydromus sexlineatus* Daud.  $\times 5$ ; 6. *Lygosoma rufescens* (Shaw)  $\times 4$ ;  
 7. *Dibamus novae-guinae* D. B.  $\times 15$ ; 8. *Ophisaurus* spec.  $\times 3$ .

3. Body compressed, covered with imbricate scales.  
Crests are often present. Acrodont; tongue short,  
slightly incised anteriorly (fig. 1.3) . . . . . *Agamidae*, p. 66.
4. Upper surface tubercular; anterior portion of  
tongue smooth, bifid, protractile . . . . . *Helodermatidae*, p. 137.
- . Head with large symmetrical shields.  
Body vermiform; anterior portion of tongue retractile  
(fig. 1.8) . . . . . *Anguidae*, p. 139.
- B. Tongue long, deeply bifid, retractile into a sheath at  
the base (fig. 1.4). Head covered with small scales. *Varanidae*, p. 141.
- C. Tongue covered with short imbricate papillae (fig. 1.6),  
or oblique folds (fig. 1.5, 7). Head with large sym-  
metrical shields.
- a. Eyes exposed.
1. Ventral scales differing from dorsals; femoral or  
inguinal pores present . . . . . *Lacertidae*, p. 153.
2. Body covered with uniform cycloid, imbricate  
scales; no femoral or praeanal pores . . . . . *Scincidae*, p. 156.
- b. Eyes covered by the skin; body vermiform . . . . *Dibamidae*, p. 282.

## 1. Fam. GECKONIDAE.

Body usually depressed, covered above with small scales or granules often intermixed with tubercles; head without large symmetrical shields. Tongue short, feebly bifid anteriorly, smooth or with long papillae (fig. 1.1); pleurodont. Eye large, with vertical pupil (*Gonatodes* has a round pupil) and without movable eyelids (except in *Aeluroscalabotes*). Ear distinct. Limbs well developed, digits strong, often dilated and used for climbing smooth surfaces. Femoral or praeanal pores often present, in the males only. Tail very fragile. Most of them are nocturnal. The eggs are round or oval (fig. 2) and have a hard whitish shell.



Fig. 2. Eggs of *Geckonidae*.  
1. *Ptychozoon homalocephalum*  
(Crev.).  
2. *Gecko verticillatus* Laur.  
3. *Hemidactylus frenatus* D. B.

## Key to the Indo-Australian genera.

- A.* Digits not or slightly dilated at the base, all clawed.
- a.* Claw between two scales, a smaller superior and a larger latero-inferior.
    1. Pupil vertical . . . . . 1. *Gymnodactylus*, p. 5.
    2. Pupil round, eyelid distinct round the eye . . . . . 2. *Gonatodes*, p. 22.
  - b.* Claw between three scales, a smaller superior and two large latero-inferior; upper and lower eyelids well developed, movable . . . . . 3. *Aeluroscalabotes*, p. 26.
- B.* Digits strongly dilated.
- a.* The free distal joint long, rising from within the extremity of the digital expansion (fig. 3).
    1. Inner digit clawed; lateral expansion of body, if present, scaled like the body; a double series of infradigital lamellae . . . . . 4. *Hemidactylus*, p. 28.
    2. Inner digit clawed; limbs, sides of head, body and tail with a dermal expansion, covered with large tetragonal scales; a double series of infradigital lamellae . . . . . 5. *Mimctozone*, p. 36.
    3. Inner digit clawless; infradigital lamellae in a double or single series . . . . . 6. *Gehyra*, p. 37.
  - b.* The free distal joint at the extremity of the digital expansion; a double series of infradigital lamellae.
    1. The distal joint long and slender; inner digit rudimentary . . . . . 7. *Hemiphyllocladactylus*, p. 46.
    2. The distal joint short; inner digit clawless. . . . . 8. *Lepidodactylus*, p. 47.
  - c.* The free distal joint at the extremity of the digital expansion (fig. 4); a single series of infradigital lamellae.
    1. Digits free or webbed . . . . . 9. *Gecko*, p. 51.
    2. Digits entirely webbed; limbs, sides of head, body and tail with a membranous expansion . . . . . 10. *Ptychozone*, p. 58.



Fig. 3. *Hemidactylus frenatus* D. B.  
Distal part of digit  $\times 8$ .

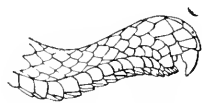


Fig. 4. *Gecko verticillatus* Laur.  
Distal part of digit  $\times 4$ .



1. *Gymnodactylus* Spix.

(SPIN, Spec. Nov. Lacert. p. 17, 1825).

Digits strong, clawed, cylindrical or depressed at the base; the distal phalanges compressed, forming an angle with the other part of the digit; the claw between two enlarged scales, the lower of which is notched under the claw; digits beneath with enlarged transverse plates (fig. 8). Body granular, the granules intermixed with tubercles. Pupil vertical. Males with or without praeanal or femoral pores.

Distribution. Borders of the Mediterranean; S. Asia; Australia; islands of the Pacific; tropical America.

## Key to the Indo-Australian species.

- A. No lateral fold; dorsal tubercles forming regular longitudinal series . . . . . 1. *G. pelagicus* p. 6.
- B. A fold from axilla to groin; large species with large head.
- I. Lateral fold with larger and smaller pointed tubercles. Tail with whorls of keeled spiny tubercles. Ventral scales small. . . . . 2. *G. lateralis* p. 7.
- II. Lateral fold with round tubercles.
- a. No praeanal nor femoral pores.
1. Ventral scales very small. Body brown above with small darker spots and V- or M-shaped cross bands. . . . . 3. *G. jellesmae* p. 8.
2. Ventral scales larger. Body light brown above with 6 paired blackish, quadrangular spots on the back, the interspaces light with small dark brown spots; head with a dark brown network. . . . . 4. *G. sermorwaiensis* p. 9.
- b. Male with femoral or praeanal pores, or both.
1. Dorsal tubercles very large; male with 18—19 femoral pores along the thigh . . . . . 5. *G. d'armandvillei* p. 11.
2. Dorsal tubercles small.
- † Male with praeanal and femoral pores.
- a. On each side 4—6 femoral pores; 12 or 13 praeanal pores in a longitudinal groove. Tail covered below with small scales. Body light brown above with dark brown spots, sometimes forming cross bands on the back. . . . . 6. *G. marmoratus* p. 13.

- b.* On each side 6—9 femoral pores; 9—10 praeanal pores, separated from the former. Tail covered below with enlarged transverse scales. Coloration as in *G. marmoratus*. . . 7. *G. batuensis* p. 14.
- c.* An angular series of 44—60 pores. Body light brown above with 5—7 broad dark brown cross bands, which are almost black towards their posterior border . . . . . 8. *G. louisianensis* p. 14.
- d.* An uninterrupted series of femoral and praeanal pores, 30 on each side forming a right angle in the middle, preceded by 4 additional praeanal pores; no groove. Body brown above with 5 pairs of blackish spots along the back, the first and last pair V-shaped. . . . . 9. *G. loriae* p. 16.
- e.* A continuous series of 42 pores; a pubic groove. Ear-opening horizontal. Body grey-brown above with blackish spots, which sometimes form irregular cross bands . . . . . 10. *G. fumosus* p. 16.
- f.* An angular series of 7—14 praeanal pores,  $\wedge$ -shaped; 10—12 femoral pores on each side, separated from the former; no groove. Body greyish-brown with narrow white, black-edged transverse bands; the first from eye to eye over the occiput, the second over the nape through the ear-opening . . . . . 11. *G. mimikanus* p. 18.
- †† Male with praeanal pores only.
- a.* An angular series of 8 or 9 pores; no pubic groove. Body pale brown with dark brown markings . . . . . 12. *G. malayanus*, p. 20.
- b.* An angular series of 9—11 pores; no pubic groove. Body dark brown above with 9 white, black-edged cross bands, much smaller than the interspaces between them . . . . . 13. *G. consobrinus* p. 21.

### 1. *Gymnodactylus pelagicus* (Girard).

*Heteronota pelagica*, Girard, Proc. Ac. Philad. 1857, p. 197.

*Gymnodactylus pelagicus*, Boulenger, Cat. Liz. I 1885, p. 40 (s. syn.).

Head large, depressed; snout nearly twice the diameter of the orbit, which is shorter than its distance to the ear-opening; forehead concave; ear-opening round, one third the diameter of the eye. Head minutely granular, the granules enlarged

on the snout and temples. Rostral large, quadrangular, about twice as broad as high, with a median cleft in the superior part; a pair of supranasals; nostril bordered by the rostral, the first upper labial, the supranasal and two or three granules. Seven or eight upper, and as many lower labials; mental very large, varying in form, longer than the labials; a pair of small chin-shields next to the mental posteriorly. Throat covered with granules, as large as those on the snout. Body short, covered above with small granules; back with 16—20 longitudinal series of round, conical, ribbed tubercles, the series regular, disposed at equal distances, the tubercles close together. Ventral scales very small, imbricate, keeled. The male has a short, angular series of 7—10 praeanal pores. Tail round, tapering, covered with uniform small, keeled scales and scattered tubercles. Limbs not very long, covered with small granules; basal part of digits with enlarged transverse, imbricate scales, the distal portion compressed.

Dark brown above, back with blackish, transverse bands; limbs with a darker network above. Belly and throat dark brown, the latter with small whitish spots. Lips with whitish labial sutures. Tail with dark undulated markings. Length of head and body 63 mm.; tail 68 mm.

Habitat: New Guinea (Bara Bara, Kelesi, Vikaiku, Fly river, Fife Bay, Yule Island, Stephansort, Sattelberg, Bukaua, Seleo Island, Dorei, Andai, Kapaor, Haas, Mafoor, lake Sentani!, Humboldt Bay!, on Tami river!, along Kaiserin-Augusta river!, along Lorentz river!). — Ferguson Island; Trobriand Island; Rossel Island; Cape York; Bismarck Archipelago; Solomon Islands; Islands of the Pacific: Santa Cruz, New Hebrides, New Caledonia, Loyalty, Tonga, Fiji Islands.

Tree-gecko.

## 2. *Gymnodactylus lateralis* Werner.

*Gymnodactylus lateralis*, Werner, Verh. Ges. Wien Bd. XLVI 1896, p. 11, Taf. 1, Fig. 4.

Head large, depressed; snout rather pointed, longer than the diameter of the orbit, which is shorter than its distance from the ear-opening; forehead strongly concave; ear-opening roundish, oblique, about one third the diameter of the eye. Head granular with small tubercles in the occipital and tem-

poral regions, the granules enlarged on the snout; rostral large, polygonal, with median cleft, entering the nostril; latter directed posteriorly, between the rostral, the first labial and five small scales. Eleven upper and ten lower labials; mental triangular; two pair of chin-shields, median largest and in contact behind the mental. Throat with minute granules. Body depressed, covered above with small granules, intermixed with small pointed, keeled tubercles; lateral fold with larger and smaller sharply pointed tubercles; ventral scales very small, cycloid, 62—64 across the middle of the belly between the lateral folds. Male with 13 praeanal pores in an angular series,  $\Lambda$ -shaped, no femoral pores<sup>1)</sup>. Tail cylindrical, annulate, covered above with small scales and keeled, spiny tubercles, arranged in transverse series, 6 in each, beneath with somewhat larger flat scales. Limbs rather long, granular with small conical tubercles; digits short, broad at the base, distally compressed; fourth toe inferiorly with 9 enlarged lamellae at the basal part.

Grey-brown above with a series of paired, large, dark brown spots, bordered with whitish; tail with four broad, dark brown annuli. A dark temporal streak. Dark bars on the labials. Lower surface dirty white. Length of head and body 81 mm.; tail 75 mm.

Habitat: Sumatra (Deli!).

### 3. *Gymnodactylus jellesmae* Boulenger.

*Gymnodactylus jellesmae*, Boulenger. Proc. Zool. Soc. London 1897, p. 203, pl. VII, fig. 1.

*Gymnodactylus jellesmae*, Roux, Zool. Jahrb. Syst. XXX 1911, p. 496.

Head large, depressed, oviform; snout longer than the diameter of the orbit, which equals its distance from the ear-opening; forehead concave; ear-opening large, oval, slightly oblique, about half the diameter of the eye. Head granular, the granules largest on the snout, with very small tubercles in the occipital and temporal regions. Rostral nearly twice as broad as deep, with M-shaped upper border, with or without median cleft above; nostril bordered by the rostral, the first labial and three or four scales. Ten to twelve upper and ten

1) The specimen probably being a female, Werner does not mention femoral or praeanal pores in his description.

or eleven lower labials; mental triangular, more broad than long; two pair of chin-shields, median largest and forming a suture behind the mental. Gular scales minute. Body covered above with small granules intermixed with small roundish, feebly keeled tubercles; lateral fold very indistinct. Ventral scales very small, cycloid, imbricate, smooth, 40—45 across the middle of the belly. No praeanal or femoral pores; the lower surface of the thighs in both sexes covered with uniform granules without any enlarged scales. Tail round, tapering, covered with uniform, small, flat scales; a few enlarged, nail-shaped tubercles form transverse series on the upper basal part of the tail. Limbs long; digits strong, slightly depressed at the base, strongly compressed in the distal part; the basal phalanx with transverse plates inferiorly.

Pale brown above, with small darker spots and V- or M-shaped cross bands on the back; a dark temporal streak, beginning at the eye. Tail with dark annuli. Lower parts brownish. Length of head and body 63 mm.; tail (reproduced) 52 mm.

Habitat: Celebes (Masarang, Buol, Wankahulu Valley, Luhu!, Kema, Rumbi-Mengkoka); Kabaëna.

#### 4. *Gymnodactylus sermowaiensis* n. sp.

Head large, broader than the body; snout longer than the diameter of the orbit, which equals its distance from the ear-opening; forehead and lores concave; ear-opening oval, vertical, about one third the diameter of the eye. Head granular, the granules enlarged on the snout, with few very small tubercles on the temples. Rostral very large, twice as broad as high, subquadrangular, with median cleft above; a supranasal, separated from its fellow by two small shields, one over the other; nostril bordered by the rostral, the supranasal, the first labial and two small shields. Fourteen upper and twelve lower labials; mental triangular, a pair of larger chin-shields forming a suture behind the mental, and a smaller shield on each side. Throat with very small granules. Body long and slender, covered above with small granules and small flat, roundish, feebly keeled tubercles. Lateral fold with slightly enlarged tubercles. Ventral scales small, cycloid, imbricate, smooth, 45 across the middle of the belly. No praeanal or femoral pores; the lower surface of the thighs covered with

uniform granules without enlarged scales. Tail cylindrical, tapering, covered above with uniform small flat scales, a few conical tubercles at the upper basal part; below with some-



Fig. 5. *Gymnodactylus sermowaiensis* n. sp.

what larger, smooth, quadrangular scales. Limbs long and slender, covered above with small granules and small keeled tubercles; digits strong, depressed at the base, which is covered below with enlarged transverse, imbricate lamellae (13 or

14 under the fourth toe), strongly compressed in the distal portion.

Light brown above, with 6 pair of large, blackish, quadrangular spots between the fore and hind limbs. The interspaces light with paired, smaller dark spots. A V-shaped band from eye to eye, an M-shaped one on the base of the tail. Head with a dark network; limbs with small dark cross bands. Tail with 6 broad, black cross bands, the interspaces narrower, light, with a small blackish cross line. Lower surface dirty white, each scale with a number of minute black dots. Length of head and body 88 mm.; tail 116 mm.

Habitat: New Guinea (along Sermowai river!).

Tree-gecko. Only one male specimen known, preserved in the Amsterdam Museum.

##### 5. *Gymnodactylus d'armandvillei* M. Weber.

*Gymnodactylus d'armandvillei*, M. Weber, Zoolog. Ergebn. Reise O. Indien I 1890/91, p. 163, pl. XIV, fig. 1.

Head large; snout twice as large as the diameter of the orbit; the distance of the latter from the ear-opening equals one time and a half its diameter; forehead concave; ear-opening sub-oval, vertical, one half the diameter of the eye. Head with small granules intermixed with conical tubercles on the occiput and temples; the granules enlarged on the snout. Rostral quadrangular, twice as broad as high, grooved, and notched behind; a small supranasal, separated from its fellow by a small azygous shield; nostril bordered by the rostral, the first labial and three nasals. Twelve upper labials, last four very small, nine or ten lower labials; mental triangular; two pair of chin-shields, median largest and broadly in contact behind the point of the mental. Throat minutely granular. Body depressed, covered above with very small granules; back with about 17—20 longitudinal series of alternate, very strong, subconical, ribbed or uni-to three-carinate tubercles. Lateral fold with slightly enlarged conical tubercles. Ventral scales small, cycloid, imbricate, 36—40 across the middle of the belly. Male with 18 or 19 femoral pores on each side along the thigh. Tail cylindrical, covered above with small scales, intermixed with rows of strong unicarinate tubercles,

6 in a row; beneath with a median series of broad transverse plates. Limbs rather long; digits long, the basal part somewhat dilated, with enlarged transverse, imbricate plates under-

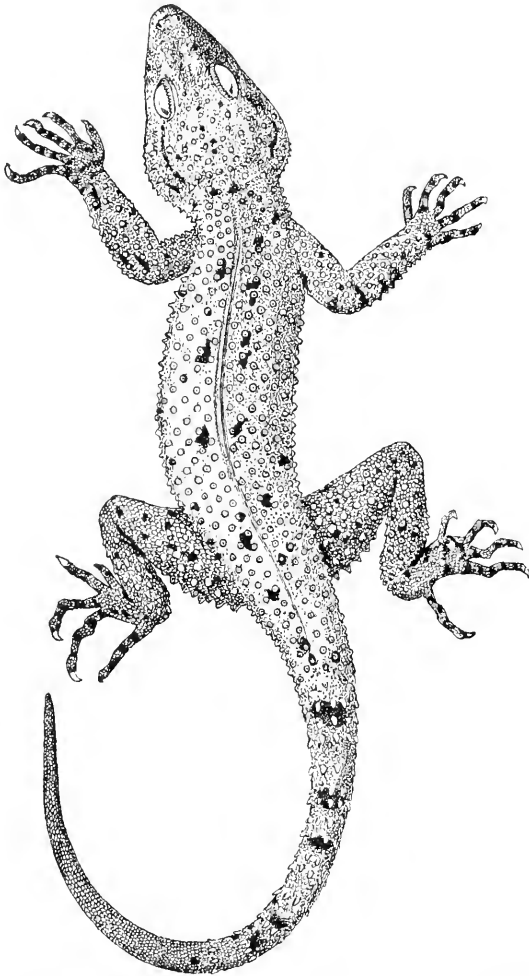


Fig. 6. *Gymnodactylus d'armandvillei* M. Web. (After M. Weber).

neath, (9 or 10 under the fourth toe), distal phalanges compressed.

Grey above, with two dorsal series of dark brown, small, more or less confluent spots; similar spots on the limbs and tail. A dark temporal streak. Lower surface whitish, each scale



punctulated with black. Length of head and body 85 mm.; tail 102 mm.

Type-specimens examined in the Amsterdam Museum.

Habitat: Flores (Sikka!); Kalao Island, N. off Flores.

### 6. *Gymnodactylus marmoratus* (Kuhl).

*Phyllurus marmoratus*, (Kuhl), Fitz. N. Class. Rept. 1826, p. 47.

*Gymnodactylus marmoratus*, Boulenger, Cat. Liz. I 1885, p. 44 (s. syn.).

Head large, depressed; snout pointed, longer than the diameter of the orbit, which equals its distance from the ear-opening; forehead concave; ear-opening oval, oblique, about one third the diameter of the eye. Head granular, with small tubercles on the occiput and temples; the granules enlarged on the snout. Rostral subquadrangular, about twice as broad as high, with median cleft above; nostril bordered by the rostral, the first labial and 4 or 5 scales. Twelve upper and ten lower labials; mental triangular; two or three pair of chin-shields, median largest and in contact behind the mental. Throat with very small granules. Body elongate, covered above with small granules, intermixed with small, round, feebly keeled, subtriangular tubercles. Lateral fold, sometimes very indistinct, with a few, slightly enlarged tubercles. Ventral scales small, smooth, cycloid, imbricate, 40—45 across the middle of the belly. Male with 12 or 13 praeanal pores in an angular series,  $\Delta$ -shaped, in a longitudinal groove, and 4—6 femoral pores, separated from the former, on each thigh. Tail round, tapering, covered with uniform small, flat scales and rows of 4—6 keeled, trihedral tubercles at the base. Limbs elongate; digits strong, slightly depressed at the base, which has enlarged transverse plates inferiorly, compressed in the distal part (fig. 8).

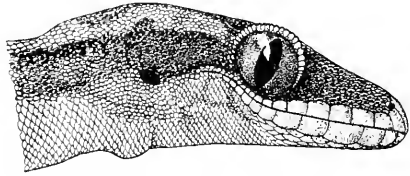


Fig. 7. *Gymnodactylus marmoratus* (Kuhl)  $\times 2$ .

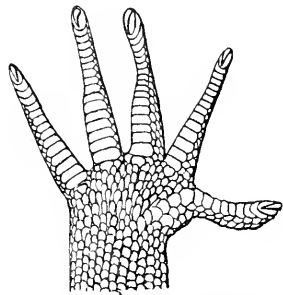


Fig. 8. *Gymnodactylus marmoratus* (Kuhl). Fore limb  $\times 3$ .

Light brown above, with spots of dark brown along the back, sometimes forming cross bands. Head with irregular dark markings; a dark temporal streak. Tail with dark brown annuli. Lower surface yellowish-white, each scale punctulated with dark brown. Length of head and body 76 mm.; tail 72 mm.

**Habitat:** Simalur!; Nias!; Engano; Sumatra! (Battak Highlands, 800—1000 M., Solok!); Java (Buitenzorg!, Salak, Sukabumi!, Depok, Tjibodas (1425 M.), Idju!, Willis Mts. 5000 feet); Lombok; Borneo (Matang, Sebruang Valley, Kina Balu, Mt. Dulit, Mt. Penrissen, Kuching, Sarawak, Bidi, Kidi-district, Sintang, Baram river, Samarinda!); Celebes (Manado, Kandari); Morotai!; Ceram!; Kei Islands; Aru Islands; New Guinea (Passim, Fak Fak, Lobo, Manokwari!, Wendesi, along Lorentz river!, Mimika river, Stekwa river, Germania Bay, Astrolabe Bay, Stephansort); Schouten Islands (Mysore). — Malacca; Pinang; Christmas Island.

Tree-gecko, sometimes hiding under stones.

A specimen from Sumatra which has a rostral, without the median cleft, emarginated; with two pair of chin-shields, the outer pair very small; no lateral row of tubercles; four dark brown longitudinal lines on the back, the outer ones beginning at the eye, has been named by Werner <sup>1)</sup> var. *quadrilineatus*.

### 7. *Gymnodactylus baluensis* Mocquard.

*Gymnodactylus Baluensis*, Mocquard, Le Natur. XII 1890, p. 144; Nouv. Arch. Mus. (3) II 1890, p. 125, pl. VII, fig. 1.

Differs from *G. marmoratus* in the following points: dorsal granulation and tubercles smaller; femoral pores 6—9 on each side, 9 or 10 precanal pores in an angular series, separated by a wide interspace from the former. Lower side of tail with enlarged transverse plates.

Type-specimens examined in the Paris Museum.

**Habitat:** Borneo (Kina Balu!, Lawas in Brunei).

### 8. *Gymnodactylus louisiadensis* de Vis.

*Gymnodactylus louisiadensis*, de Vis, Ann. Queensl. Mus. I 1892, p. 11.

1) Verh. Ges. Wien XLVI 1896, p. 11.

*Gymnodactylus louisiadensis*, Boulenger, Ann. Mus. Civ. Genova (2) XVIII 1897, p. 695.

*Gymnodactylus louisiadensis*, Lönnberg, Ann. Nat. Hist. (7) VI 1900, p. 575.

*Gymnodactylus louisiadensis*, Werner, Verh. Ges. Wien LI 1901, p. 603.

*Gymnodactylus olivii*, Garman, Bull. Mus. Comp. Zool. Harv. Coll. XXXIX 1901, p. 1, pl. I, fig. 1.

Head large, oviform; snout twice as large as the diameter of the orbit; the distance between the orbit and the ear-opening equals one time and a half its diameter; forehead concave; ear-opening large, oval, vertical, one third the diameter of the eye. Head granular with small conical tubercles on the occiput and temples; the granules enlarged on the snout and supraorbital region. Rostral very large, one time and a half as broad as high, with a median groove; a large supranasal, separated from its fellow by a small azygous shield; nostril bordered by the rostral, the first labial and 4 nasals. Twelve to thirteen upper labials, last three small, ten to twelve lower labials; mental large, triangular; three pair of chin-shields; median largest and broadly in contact behind the mental. Throat granular. Body stout, elongate, covered above with small granules, back with 26 longitudinal series of small conical, keeled tubercles. Lateral fold with enlarged, round, smooth tubercles. Ventral scales rather large, cycloid, imbricate, 40—42 across the middle of the belly. Male with an uninterrupted, curved series of 36—60 pores along the thighs. Tail round, long, covered above with small scales and rings of keeled tubercles in the basal part, beneath with large transverse plates. Limbs long; digits strong, the basal part dilated and covered beneath with transversely enlarged lamellae (10—16 under the fourth toe), distal phalanges compressed.

Light brown above, with 4—7 broad, dark brown cross bands, which are almost black at their posterior border; the first one V-shaped, from eye to eye, the apex on the nape, the second horseshoe-shaped. Tail with 5 broad blackish rings, the interspaces and the distal part light. Lower surface dirty white, each scale dotted with black. Length of head and body 116 mm.; tail 128 mm.

Habitat: New Guinea (Gerekanumu, Sattelberg, along the Lorentz river!). — Sudest Island; Rossel Island; Ferguson and Woodlark Islands; Solomon Islands; Queensland.

9. *Gymnodactylus loriae* Boulenger.

*Gymnodactylus loriae*, Boulenger, Ann. Mus. Civ. Genova (2) XVIII 1897, p. 695, pl. VI.

*Gymnodactylus loriae*, Werner, Verh. Ges. Wien LI 1901, p. 604.

Head large; snout longer than the diameter of the orbit, which equals its distance from the ear-opening; forehead and lores concave; ear-opening roundish, one third the diameter of the eye. Head granular, with small round tubercles on the occiput and temples; rostral subquadrangular, nearly twice as broad as deep, with median cleft above; a large supranasal, separated from its fellow by a small azygous shield; nostril bordered by the rostral, the supranasal, the first upper labial, and three or four small granules. Twelve upper and ten or eleven lower labials; mental pentagonal or subtriangular; two or three pair of chin-shields, median largest and forming a suture behind the mental. Throat with very small granules. Body long, covered above with small flat granules, intermixed with small round, flat, feebly keeled tubercles. Lateral fold with a series of slightly enlarged tubercles. Ventral scales small, smooth, juxtaposed or subimbricate. Male with a long uninterrupted series of femoral and praeanal pores, 30 on each side, forming a right angle in the middle, preceded by 4 additional praeanal pores; no praeanal groove. Tail round, tapering, covered with uniform flat scales. Limbs long; digits strong, slightly depressed at the base, strongly compressed at the end-phalanges, inferior transverse lamellae well developed.

Brown above, with a series of paired blackish spots along the back, three pair between the fore and hind limbs. The last pair on the base of the tail, confluent into a V; a V-shaped dark band from eye to eye, the apex on the nape. Lower parts pale brown. Reproduced tail longitudinally streaked with black. Length of head and body 122 mm.; tail 65 mm.

Habitat: New Guinea (Haveri!, Moroka, 2300 feet).

10. *Gymnodactylus fumosus* F. Müller.

*Gymnodactylus fumosus*, F. Müller, Verh. Ges. Basel X 1895, p. 833 & 865.

*Gymnodactylus fumosus*, Boulenger, Proc. Zool. Soc. London 1897, p. 204, pl. VII, fig. 2.

*Gymnodactylus philippinus*, Boettger, Abh. Senckenb. Ges. XXV 1900, p. 332.

Head large, depressed, oviform; snout longer than the dia-

meter of the orbit, which nearly equals its distance from the ear-opening; forehead concave; ear-opening horizontal <sup>1)</sup> or oval and oblique, one half to two-thirds the diameter of the eye. Head granular, the granules slightly enlarged on the snout, with very small tubercles on the temple. Rostral nearly twice as broad as high, subquadrangular, with median cleft above, in contact with two or three small shields at its upper border; nostril bordered by the rostral and three scales, sometimes also by the first upper labial. Nine or ten upper and eight or nine lower labials; mental triangular, more broad than long; a pair of large chin-shields forming a suture behind the mental, with one or two much smaller shields on each side. Body covered above with small granules and few, widely scattered, roundish, flat and smooth or slightly keeled, small tubercles. A distinct lateral fold. Ventral scales small, cycloid, imbricate, smooth, 35—40 across the middle of the belly. Male with a pubic groove and a continuous series of 42—52 pores, pierced in enlarged scales, which are visible in the female. Tail cylindrical, tapering, covered with small flat scales, which are larger on the lower surface. Limbs long; digits strong, slightly depressed at the base, strongly compressed in the distal part; the basal phalanx with well developed transverse plates below.

Grey, grey-brown, or pinkish-brown above, with blackish spots, which may form irregular transverse bands on the body; a dark streak from the eye to the shoulder. Tail with dark bands; reproduced tail longitudinally streaked with blackish. Lower parts whitish or brownish, uniform or with dark dots. Length of head and body 71 mm.; tail 77 mm.

Habitat: Celebes (Bone Mts. 1200 M., Rurukan!, Masarang, 1260 M.); Halmahera!; Java (Preanger!).

Note: At a closer examination of a specimen preserved in the British Museum and four specimens of the Senckenberg Museum in Francfort, named by Boettger *G. philippinicus*, I came to the conclusion, that they did not belong to that species, but were most probably *G. fumosus*, slightly different from the typical Celebes-specimens. The dorsal tubercles are somewhat larger and more numerous; the ear-opening is oval, oblique. That they could not belong to *G. philippinicus*, was

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1) The type-specimens have a horizontal ear-opening, which is perhaps due to the state of preservation.

evident at first sight, because the last-named species has a pubic groove with two parallel series of six praeanal pores, and the subdigital transverse plates scarcely differ from the surrounding scales.

The Javanese specimen, examined by me, also had an oval, oblique ear-opening, partly covered by a fold of the skin above and below.

### 11. *Gymnodactylus mimikanus* Boulenger.

*Gymnodactylus mimikanus*, Boulenger, Transact. Zool. Soc. London XX 1914, p. 253, pl. XXVIII fig. 2.

*Gymnodactylus consobrinus*, de Rooij, Nova Guinea V Zool. 1909, p. 375.

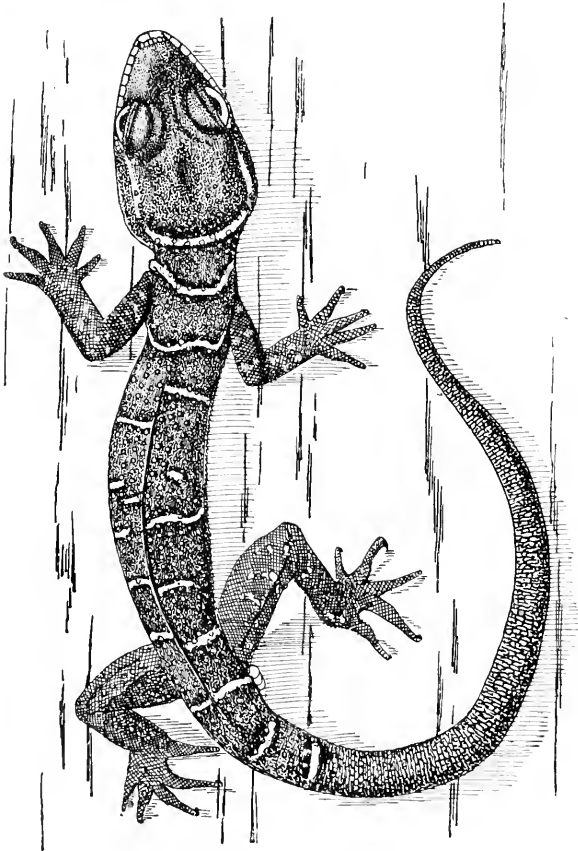


Fig. 9. *Gymnodactylus mimikanus* Boulenger.

Head large, depressed; snout one time and a half the diameter

of the orbit, which equals its distance from the ear-opening; forehead concave; ear-opening vertically oval, one fourth the diameter of the eye. Head covered with small granules, those on the snout enlarged; on the occiput small conical tubercles. Rostral large, twice as broad as high, with a median cleft in the superior part; above the rostral are four small scales; nostril bordered by the rostral, the first labial, a supranasal and three or four granules. Eleven or twelve upper and eleven lower labials; mental large, triangular; a median pair of large chin-shields forming a long suture behind the mental, followed by a much smaller one; throat granular. Body long, depressed, covered above with small granules and longitudinal series of trihedral tubercles. Lateral fold with enlarged conical tubercles. Ventral scales moderate, cycloid, imbricate, smooth, 42—45 across the middle of the belly. Male with an angular series of 7—14 praeanal pores, separated from a series

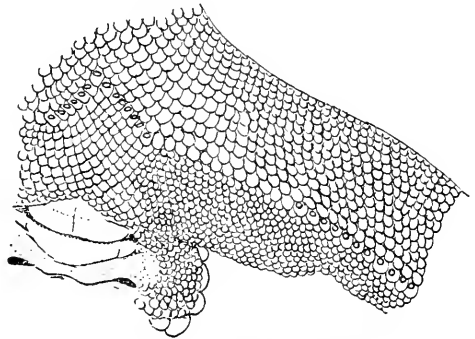


Fig. 10. *Gymnodactylus mimikanus* Blgr.  
Praeanal and femoral pores  $\times 3$ .

of 10 to 12 femoral pores (fig. 10). Tail round, covered above with uniform small scales, below with transversely dilated scales; on the basal part transverse series of tubercles. Limbs long, depressed, covered above with granules and tubercles; digits strong, the basal part covered below with transverse plates, the distal part compressed.

Greyish-brown above with narrow white black-edged cross lines or dark brown transverse lines, the first from eye to eye over the occiput, the second over the nape through the ear-opening. Limbs and tail also with white cross lines; basal part and tip of tail greyish or brownish, median part lead-colour. Lips with lighter spots. Lower parts lighter, dotted with brown. Length of head and body 95 mm.; tail 132 mm.

Type-specimens examined in the British Museum.

Habitat: New Guinea (Lake Sentani!, Njao on the Tjano river!, Mimika river!, Utakwa river!).

12. *Gymnodactylus malayanus* n. sp.

Head large, depressed, snout nearly one time and a half the

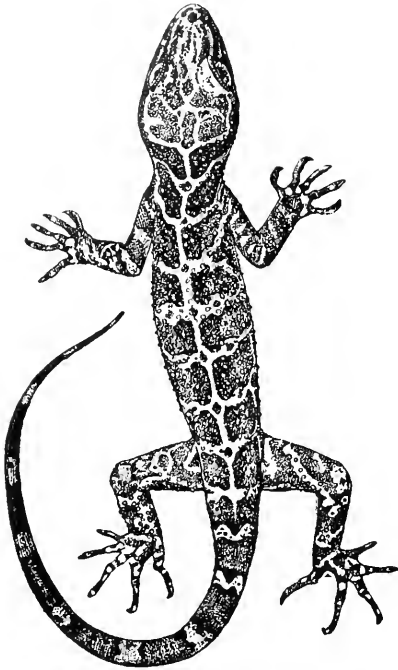


Fig. 11. *Gymnodactylus malayanus* n. sp.

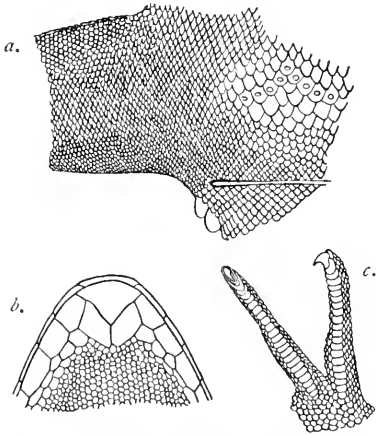


Fig. 12. *Gymnodactylus malayanus* n. sp.  
a. Praeanal pores; b. chin-shields;  
c. lower view of digits  $\times 3$ .

diameter of the orbit, which equals its distance from the ear-opening; forehead and loreal region concave; ear-opening oval, oblique, one third the diameter of the eye. Head granular, with small tubercles on the occiput and temples, the granules largest on the snout. Rostral quadrangular, twice as broad as high, with median cleft above; nostril bordered by the rostral and three or four scales. Eight to ten upper and eight or nine lower labials; mental large, triangular; a large median pair of chin-shields (fig. 12*b*), in contact behind the mental, followed by two smaller shields. Throat minutely granulate. Body long, covered

above with very small granules and numerous small, round, keeled tubercles. Lateral fold distinct, with a few enlarged tubercles. Ventral scales small, cycloid, imbricate, 50-60 across the middle of the belly. Male with 9 (8) praeanal pores in an angular series (fig. 12*a*) no pubic groove. Tail round, tapering, one and one third time the length of head and body, covered with small scales and rows of keeled, trihedral tubercles at the basal half; scales of the



lower part enlarged. Limbs long; digits long, very little depressed at the base, strongly compressed in the distal part; basal part with small transverse plates below, narrower than the digit, rounded (fig. 12 c).

Pale greyish-brown above, with dark brown transverse markings, separated on the vertebral line; flanks with a series of dark round spots, sometimes confluent with the transverse bands. Head with symmetrical dark spots, separated by greyish-white; a broad dark band from the eye to the nape, not meeting its fellow. Tail with ten dark brown transverse bands. Lower parts yellowish, each scale dotted with brown. Length of head and body 72 mm.; tail 95 mm.

Habitat: Indo-Australian Archipelago!.

Note: This description is based upon two specimens, a male and a female, preserved in the Utrecht Zoological Museum. They were only marked with the indication: O. I. Archipel.

### 13. *Gymnodactylus consobrinus* Peters.

*Gymnodactylus consobrinus*, Peters, Mon. Berl. Ac. 1871, p. 569; Ann. Mus. Civ. Genova III 1872, pl. II fig. 1.

*Gymnodactylus consobrinus*, Boulenger, Cat. Liz. I 1885, p. 47.

*Gymnodactylus feae*, Annandale, Ann. Nat. Hist. (7) XV 1905, p. 27; Journ. Asiat. Soc. Beng. I 1905, p. 84.

Head large, depressed; snout rounded, one time and a half the diameter of the orbit, which equals its distance from the ear-opening; forehead strongly concave; ear-opening small, oval, vertical, about one fourth the diameter of the eye. Head granular, the granules enlarged on the snout and the supra-ocular region; small conical tubercles on the occiput and temples. Rostral very large, subquadrangular, twice as broad as high, with median cleft above; a supranasal, separated from its fellow by one or two small median shields; nostril bordered by the rostral, the supranasal, the first labial and three small scales. Ten to thirteen upper and ten to twelve lower labials; mental triangular; a large pair of chin-shields forming a long median suture behind the mental, on each side a smaller shield. Throat with small granules. Body long, depressed, covered above with small granules, intermixed with round conical, feebly keeled tubercles. Lateral fold with slightly enlarged tubercles. Ventral scales small, cycloid, smooth, im-

bricate, 65—70 across the middle of the belly. Male with an angular series of 9—11 praeanal pores, no groove, no femoral pores. Tail round, tapering, covered above with uniform small, flat scales and rows of 4—8 keeled, trihedral tubercles at the base; below with broad transverse scales. Limbs elongate; digits strong, depressed at the base, which has broad enlarged transverse, imbricate scales underneath, compressed in the distal portion.

Dark brown above with 8 or 9 narrow white, black-edged cross lines, one from eye to eye on the occiput and another across the nape from one eye to the other, through the ear-opening. Head brown with a network of narrow white lines; upper lip with white spots. Limbs and tail also with white, dark-edged cross lines. Lower surface dirty-white, each scale with a number of blackish dots. Young specimens are very dark, almost black. Length of head and body 125 mm; tail 153 mm.

Habitat: Sumatra (Muara Labu!); Singkep!; Borneo (Matang, Santubong, Kuching, Bidi, Balingeau, Kidi district, Sarawak, Belaga and Rejang rivers, River Bo, Sandakan Bay!). Tree-gecko.

Note: After examination of a specimen of *Gymnodactylus feae* from Singkep, Dr. Annandale kindly lent me, I came to the conclusion that the three specimens in the Indian Museum, collected at Singkep, are young females of *G. consobrinus* Ptrs. Dr. Annandale quite agrees with me (Rec. Ind. Mus. IX, part V, 1913, p. 322).

## 2. *Gonatodes* Fitzinger.

(FITZINGER, Syst. Rept. p. 91, 1843).

Digits slender, clawed, cylindrical or depressed at the base; the distal phalanges compressed, forming an angle with the other portion of the digits. The claw between two enlarged scales, a smaller superior and a larger latero-inferior. Basal portion of digits beneath with a row of plates (fig. 14). Body depressed, granular or tubercular above. Pupil circular; eyelid distinct all round the eye. Males with or without praeanal or femoral pores. Diurnal.

Distribution. Tropical America; Tropical Africa; the East Indies.

## Key to the Indo-Australian species.

A. Males with femoral and praeanal pores.

1. Flanks and tail with spine-like tubercles . . . . . 1. *G. kandianus* p. 23.
2. Body covered with minute granules, intermixed with irregularly arranged, slightly keeled small tubercles. 2. *G. affinis* p. 24.

B. No femoral or praeanal pores.

1. Back with uniform small granules; snout short and pointed . . . . . 3. *G. timorensis* p. 25.
2. Back with small granules intermixed with keeled tubercles; snout long and broad . . . . . 4. *G. kendalli* p. 25.

1. *Gonatodes kandianus* (Kelaart).

*Gymnodactylus kandianus*, Kelaart, Prodr. Fauna Zeyl. 1855, p. 186.

*Gonatodes kandianus*, Boulenger, Cat. Liz. I 1885, p. 68 (s. syn.).

Head long; snout somewhat pointed, longer than the distance between the eye and the ear-opening, one time and a half the diameter of the orbit; forehead not concave; ear-opening small, oval, vertical.

Head covered with small granules, those on the snout oval, keeled. Rostral large, twice as broad as high, with median emargination, in

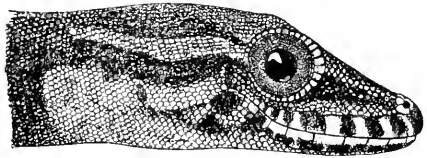


Fig. 13. *Gonatodes kandianus* (Kel.)  $\times 5$ .

which a small azygous shield, a cleft above; nostril bordered

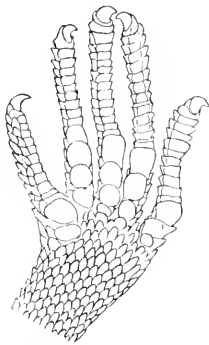


Fig. 14. *Gonatodes kandianus* (Kel.). Fore limb  $\times 10$ .

by the rostral and three enlarged scales. Seven or eight upper and as many lower labials; mental large, triangular, rounded posteriorly; many small chin-shields passing gradually into the feebly keeled, gular granules. Body slender, covered above with small keeled granules, intermixed with small keeled tubercles; flanks with small, widely separated, spine-like tubercles. Ventral scales cycloid, imbricate, keeled or smooth. Male with 2—4 praeanal and on each thigh 3—5 femoral pores. Tail cylindrical, tapering,

covered above with small keeled scales and rows of spine-like tubercles, 6 in a row, below with larger keeled scales. Limbs long, covered with keeled scales, the hind limb reaching the axilla or the shoulder; digits

long (fig. 14) and slender; the basal part not dilated, with enlarged transverse plates below (4—6 under the fourth toe).

Dark brown above, variegated with darker and lighter, these markings often forming transverse bands on the back and tail; sometimes a light vertebral band; the spiny tubercles on the flanks with a white point. Lower surface brownish, the throat darker. Length of head and body 37 mm.; tail 44 mm.

Habitat: Simalur!; Nias!; Mentawai Islands (Sipora); Engano. — Ceylon; S. India.

## 2. *Gonatodes affinis* (Stol.).

*Cyrtodactylus affinis*, Stoliczka, J. Asiat. Soc. Bengal XXXIX 1870, p. 167, pl. X, fig. 1.

*Gymnodactylus affinis*, Boulenger, Cat. Liz. I 1885, p. 42.

*Gonatodes penangensis*, S. Flower, Proc. Zool. Soc. London 1896, p. 863, pl. XLIV, fig. 1.

*Gonatodes affinis*, S. Flower, Proc. Zool. Soc. London 1898, p. 455.

Head oval; snout broad and rounded, depressed, longer than the distance between the eye and the ear-opening, nearly twice the diameter of the orbit. Eye large; ear-opening vertically oval. Rostral large, quadrangular, not twice as broad as high, with median cleft; nostril bordered by the rostral and several small scales. Nine to thirteen upper and nine to eleven lower labials; mental very large, subtriangular; two large chin-shields, two or three scales following the mental slightly enlarged. Body slender, covered with very small granules and irregularly arranged slightly keeled small tubercles. Ventral scales very small, juxtaposed, convex, keeled. Male with 5—8 preanal pores in an angular or crescent-shaped line. Tail cylindrical, slender, with small keeled scales and some small pointed tubercles. Limbs long; digits long and slender, compressed. The intermediate phalange between the basal and the terminal part is covered beneath with small irregular scales; rest of fingers and toes with small transverse lamellae below; a large oval plate at the articulation of the basal and proximal phalanges.

Yellowish-brown above, mottled with dark brown, shoulders red-brown; five transverse yellow bands, the two anterior ones very distinct, the tubercles on these two brilliantly gold; head with dark lines and light spots. Tail with bands of light and dark brown. Lower part of head and throat orange, belly purplish-grey. Some Bornean specimens are coal black with

small yellow spots on the back; tip of tail yellow. Length of head and body 48 mm.; tail 45 mm.

Habitat: Borneo (Mt. Penrissen — 3000 feet). — Malacca, 2200—4000 feet.

### 3. *Gonatodes timorensis* (Dum. & Bibr.).

*Gymnodactylus timoriensis*, Dum. & Bibr., *Erpét. Gén.* III 1836, p. 411.

*Gonatodes timorensis*, Boulenger, *Cat. Liz.* I 1885, p. 63.

Snout short, pointed; ear-opening small, oval, oblique. Head covered with small granules, enlarged on the snout; rostral large, a little more broad than high; nostril bordered by the rostral and three nasals. Five upper and three lower labials; mental very large, rounded posteriorly, followed by two small chin-shields. Body rather short, covered above with small equal granules. Ventral scales hexagonal, imbricate. No femoral or praeanal pores. Limbs strong, covered with uniform granules; digits long and slender, with transverse, subimbricate scales below.

Reddish-brown above, with a series of brown spots along each side of the vertebral line; flanks with a series of dark brown spots. Lower parts greyish. Length of head and body 35 mm.

Type-specimen examined in the Paris Museum.

Habitat: Timor!.

### 4. *Gonatodes kendalli* (Gray).

*Heteronota kendallii*, Gray, *Cat.* 1845, p. 174.

*Gonatodes kendallii*, Boulenger, *Cat. Liz.* I 1885, p. 63, pl. V fig. 4.

Head oval, snout long and broad, rounded, depressed, with strong canthal ridges, much longer than the distance between the eye and the ear-opening, one time and a half the diameter of the orbit. Eyes large; ear-opening oval, vertical, two fifths the diameter of the eye. Rostral large, quadrangular, not twice as broad as high, with median cleft; nostril between the rostral and several granules. Eleven to thirteen upper and ten to twelve lower labials; mental very large, subtriangular; two large chin-shields. Body very slender, covered above with small granules, intermixed with small keeled tubercles. Ventral scales very small, juxtaposed, convex, keeled. No praeanal or femoral pores. Tail cylindrical, slender, with small keeled scales and large pointed tubercles, of which there is sometimes a median

series on the lower surface. Limbs long; digits long and slender, compressed, inferiorly with small lamellae and a large oval plate at the articulation of the basal and proximal phalanges.

Yellow above, with reddish-brown and dark brown markings. Tail with yellow and reddish-brown bands. Lower parts purplish-grey. Length of head and body 80 mm.; tail 62 mm.

Habitat: Borneo (Matang!, Kuching, Baii!, Bidi, Sarawak, Mt. Penrissen, Santubong, Simatau); Natuna Islands (1000 feet)!. — Malacca, 3400—4600 feet.

In the daytime, it hides under rocks in crevices.

### 3. *Aeluroscalabotes* Boulenger.

*Pentadactylus* Günther, Rept. Brit. Ind. 1864, p. 117.

*Aelurosaurus* Boulenger, Cat. Liz. I 1885, p. 73.

*Aeluroscalabotes* Boulenger, Ann. Nat. Hist. (5) XVI 1885, p. 387.

Digits short (fig. 16), clawed, cylindrical at the base, and with transverse lamellae below, compressed in the distal phalanges, which are raised; the claw retractile between three large plates forming a compressed sheath. Body with small juxtaposed flat scales; upper and lower eyelids well developed. Pupil vertical. Males with praeanal pores.

Distribution. Malacca; Borneo.

#### Key to the Indo-Australian species.

- A.* Back with uniform flat granules. . . . . 1. *A. felinus* p. 26.  
*B.* Back with two longitudinal rows of small tubercles along  
the light vertebral line, rest of back covered with small  
granules . . . . . 2. *A. dorsalis* p. 27.

#### 1. *Aeluroscalabotes felinus* (Günther).

*Pentadactylus felinus*, Günther, Rept. Brit. Ind. 1864, p. 117, pl. XII, fig. F.

*Pentadactylus borneensis*, Günther, op. cit.

*Aelurosaurus felinus*, Boulenger, Cat. Liz. I 1885, p. 73, pl. III, fig. 8.

*Aeluroscalabotes felinus*, Boulenger, Ann. Nat. Hist. (5) XVI 1885, p. 387; Cat. Liz. III 1887, p. 482.

Head broader than the body, depressed, long, very distinct from neck; snout pointed, longer than the distance between the eye and the ear-opening, one and one third time the diameter of the orbit; ear-opening small, roundish, oblique. Rostral broad and low, separated from the nostril, which is bordered

by two larger anterior nasals, the first labial and small granules posteriorly. Two large internasals followed by three other

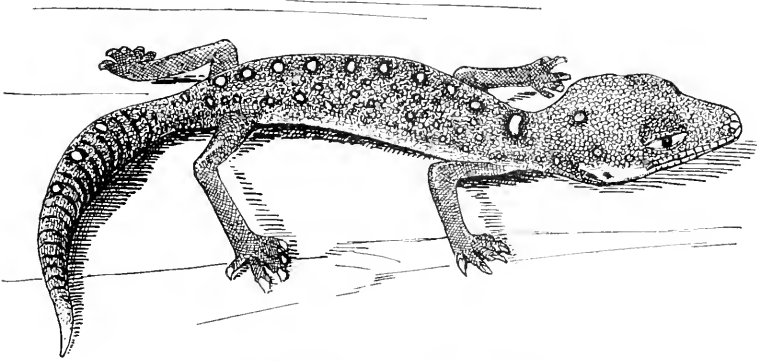


Fig. 15. *Aeluroscalabotes felinus* (Gthr.).

plates. Thirteen upper and as many lower labials, the latter in contact with another series of large plates; mental small. Body slender, somewhat compressed, covered with uniform, small, flat granules. Tail short, vertically oval, annulate, ending in an obtuse point, probably prehensile. Male with 21 prae-anal pores in an angular series. Limbs long and thin.

Brown above, with one or two dorsal series of white, dark-edged ocelli; scattered white dots on the sides of the body; upper lip whitish. Tail brown with white ocelli and a white point. Lower parts whitish, brown-dotted. Length of head and body 94 mm. tail 63 mm.

Habitat: Borneo (Mahakkam river!, Mt. Penrissen, Saribas, Kuching, Bidi, Pankalan empat). — Malacca.

## 2. *Aeluroscalabotes dorsalis* (Peters).

*Pentadactylus dorsalis*, Peters, Mon. Berl. Ac. 1871, p. 569; Ann. Mus. Civ. Genova III 1872, p. 28, pl. II, fig. 2.

*Aelurosaurus dorsalis*, Boulenger, Cat. Liz. I 1885, p. 74.

*Aeluroscalabotes dorsalis*, Boulenger, Ann. Nat. Hist. (5) XVI 1885, p. 387.

Back covered with small granules. Along the vertebral line on each side a row of small, flat tubercles.

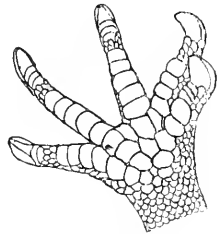


Fig. 16. *Aeluroscalabotes felinus* (Gthr.). Fore limb  $\times 5\frac{1}{2}$ .

Body brown with a yellow median dorsal band; on the flanks a row of scattered yellow dots. Otherwise similar to the preceding species. (After Peters, not seen by me).

Habitat: Borneo (Sarawak).

#### 4. *Hemidactylus* Gray.

(GRAY, Ann. Phil. (2) X p. 199, 1825).

Digits free (fig. 18) or webbed (fig. 24), dilated, beneath with two rows of lamellae; all the digits with compressed distal clawed phalanges, angularly bent and rising from within the extremity of the dilated part (fig. 3). Dorsal scales uniform or heterogeneous. Pupil vertical. Males with preanal or femoral pores.

Distribution. Southern Europe; Southern Asia; Africa; Tropical America; Polynesia.

#### Key to the Indo-Australian species.

##### A. Digits quite free.

##### I. Dorsal tubercles small, smooth, conical.

a. Tail with rows of enlarged tubercles. . . . . 1. *H. frenatus* p. 28.

b. Tail depressed, flat inferiorly, with sharp denticulated lateral edge, covered above with uniform small scales. A slight fold of the skin along the sides of the belly and another bordering the thighs posteriorly . . . . . 2. *H. karenorum* p. 30.

c. Tail round, depressed at the base, covered above with uniform small scales. A fold along the sides of the belly . . . . . 3. *H. nigricentris* p. 31.

##### II. Dorsal tubercles large, strongly keeled, arranged

in 16—20 longitudinal rows. . . . . 4. *H. brooki* p. 32.

##### B. Digits more or less webbed.

##### I. A fold on the sides of the body; tail depressed,

with sharp, denticulated lateral edge . . . . . 5. *H. garnoti* p. 33.

##### II. A cutaneous expansion from axilla to groin,

digits nearly half-webbed. . . . . 6. *H. platyurus* p. 34.

#### 1. *Hemidactylus frenatus* Dum. & Bibr.

*Hemidactylus frenatus*, Dum. & Bibr., Erp. Gén. III 1836, p. 366.

*Hemidactylus frenatus*, Boulenger, Cat. Liz. I 1885, p. 120 (s. syn.).

Snout longer than the distance between the eye and the ear-opening, one time and one third to one time and a half the diameter of the orbit; forehead concave; ear-opening small,



roundish. Head covered with small granules, largest on the snout. Rostral quadrangular, nearly twice as broad as high, with median cleft above; nostril bordered by the rostral, the first

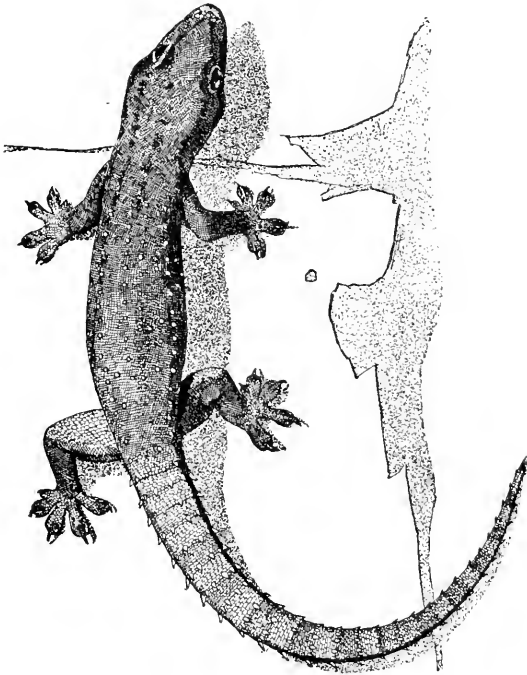


Fig. 17. *Hemidactylus frenatus* D. B.

labial and three nasals. Ten to twelve upper and eight or ten lower labials; mental large, triangular or pentagonal; two or three pair of chin-shields, the median in contact behind the mental. Body granular with more or less numerous, sometimes absent, irregularly scattered, round, convex tubercles, which are smaller than the ear-opening. Ventral scales cycloid, imbricate. Male with an uninterrupted series of 28—36 femoral pores. Tail rounded, feebly depressed, covered above with very small smooth scales and 6 longitudinal series of keeled tubercles, below with a median series of transversely dilated plates. Limbs moderate; digits dilated, free (fig. 18), inner with sessile claw; 3 or

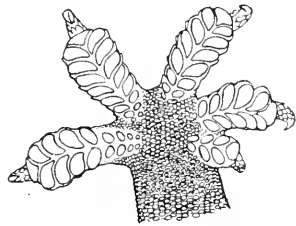


Fig. 18. *Hemidactylus frenatus* D. B. Fore limb  $\times 4$ .

5 lamellae under the inner digits, 7 to 9 under the fourth finger, 9 or 10 under the fourth toe.

Greyish or pinkish-brown above, uniform or with dark markings; head variegated with brown; a brown streak, light-edged above on the side of the head, passing through the eye, sometimes continued along the side of the body. Lower parts whitish, the scales sometimes dotted with brown. Length of head and body 65 mm; tail 69 mm.

Nom. indig.: Tjitjak (Mal.).

Habitat: Simalur!; Nias!; Mentawai Islands (Saibi!); Sumatra (Medan!, Indragiri, Bingin Telok, Palembang!, Fort de Kock, Agam, Taluk!, Gunung Sahilan!, Padang); Singkep; Banka; Borneo (Sandakan Bay!, Kapuas river, Tuaran river, Baram river, Sarawak!, Kuching, Sintang, Bandjermasin); Java (Batavia, Buitenzorg!, Gadok, Ngawi); Bali; Lombok!; Sumbawa; Flores!; Adonara!; Lombok!; Gr. Bastaard; Wetar; Ombai; Sumba!; Savu; Rotti; Timor!; Buton; Celebes (Manado, Gorontalo, Posso!, Mapane, Wangkahulu Valley, Buol, Kema, Eurekang, Kandari, Luhu!, Macassar!, Pare Pare!); Saleyer!; Ceram; Ambon; Batjan; Ternate; Halmahera; Obi; Kei Islands; Aru Islands; Salawatti; Waigeu!; New Guinea (Fak Fak, Dorei, Mansinam, Andai, Sorong, Manokwari!, Djajna, Port Moresby, Rigo, Inawi); Yule Island; Schouten Islands (Mysore); Jobi. — Malacca; Andamans; Nicobars; Ceylon; Southern India; Burma; Assam; China; Philippines; Bismarck Archipelago; Murray Island; Christmas Island; St. Helena; Madagascar; Mauritius; Somali; Cape-Colony.

The commonest house-gecko throughout the Indo-Australian Archipelago.

## 2. *Hemidactylus karenorum* (Theob.).

*Doryura karenorum*, Theobald, Journ. Linn. Soc. X 1868, p. 30.

*Hemidactylus karenorum*, Boulenger, Cat. Liz. I 1885, p. 140.

*Hemidactylus karenorum*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 189.

Snout longer than the distance between the eye and the ear-opening, one and one third or one and two fifths the diameter of the orbit; forehead slightly concave; ear-opening small, roundish. Head granular, the granules enlarged on the snout. Rostral four-sided, not quite twice so broad as high, with median cleft above; nostril bordered by the rostral, the

first labial and three nasals. Eleven or twelve upper and seven to nine lower labials; mental large, triangular; two pair of chin-shields, median pair in contact. Body covered with minute granules and numerous small convex round tubercles; a slight lateral fold and another bordering the thighs posteriorly. Ventral scales cycloid, imbricate. Male with six praeanal pores in an angular series? (The female has six enlarged scales in the praeanal region). Tail depressed, flat below, with sharp denticulated lateral edge, covered above with equal small scales, below with a median series of large transversely dilated plates. Limbs moderate; digits free, dilated, inner well developed; infradigital lamellae curved, five under the thumb, nine under the fourth finger, 5 or 6 under the first toe, 10 or 12 under the fourth toe.

Light grey-brown above, variegated with darker brown. Lower parts whitish. Length of head and body 50 mm.; tail 56 mm.

Habitat: Borneo (Gunung Kenepai!). — Burma.

### 3. *Hemidactylus nigriventris* Lidth.

*Hemidactylus nigriventris*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 188.

Snout short, as long as the distance between the eye and the ear-opening; forehead concave; ear-opening oval, oblique. Head covered with small granules, largest on the snout. Rostral four-sided, nearly twice as broad as high, with median cleft above; nostril bordered by the rostral and four nasals, the first labial separated from the nostril by the first nasal.

Ten upper and twelve lower labials; mental large, triangular; two pair of chin-shields, the first in contact behind the

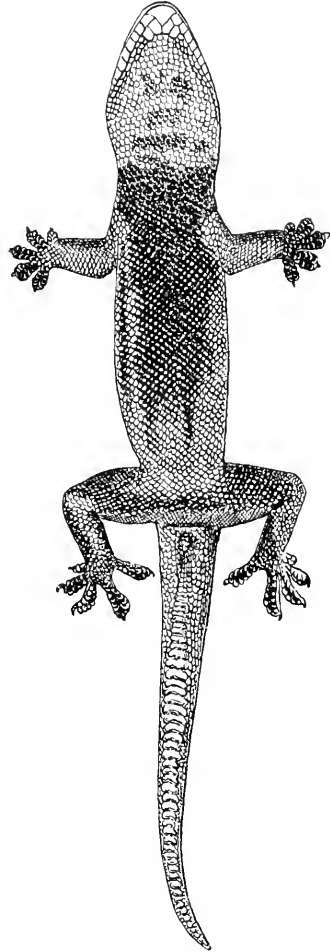


Fig. 19. *Hemidactylus nigriventris* Lidth. Ventral surface.

mental. On the body some irregularly scattered small, round, convex tubercles, always much smaller than the ear-opening. A distinct fold from axilla to groin. Ventral scales cycloid, imbricate. Tail roundish, depressed at the base, tapering, covered above with very small smooth scales, below with a median series of transversely dilated plates. Digits free, dilated, inner with sessile claw; 2 lamellae under the inner, 4 or 5 under the median digits.

Grey above, with small whitish spots along the sides; lateral fold white. Head and throat whitish beneath, belly blackish. Limbs variegated with lighter grey; on each digit a white spot. Tail dark brown below, except 14 or 15 plates in the middle of the tail, which are whitish. Length of head and body 50 mm.; tail 43 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Sintang!).

#### 4. *Hemidactylus brooki* Gray.

*Hemidactylus brookii*, Gray, Cat. Liz. 1845, p. 153.

*Hemidactylus brookii*, Boulenger, Cat. Liz. I 1885, p. 128; Ann. Nat. Hist. I 1898, p. 123.

*Hemidactylus gleadowi*, Murray, Zool. Sind 1884, p. 360.

*Hemidactylus gleadowii*, Boulenger, Cat. Liz. I 1885, p. 129.

*Hemidactylus Tenkatei*, v. Lidth de Jeude, Notes Leyden Mus. XVI 1895, p. 121.

Snout somewhat longer than the distance between the eye and the ear-opening, nearly twice the diameter of the orbit; forehead concave; ear-opening small, oval, vertical, about one third the diameter of the eye; on the occiput very small round tubercles. Rostral quadrangular, with a median cleft; nostril bordered by the rostral, the first upper labial and three nasals, the upper not in contact with its fellow. Eight to ten upper and seven to nine lower labials; mental large, triangular; two or three pair of chin-shields, median forming a suture. Scales of the throat granular. Body covered with small granules, intermixed with large keeled trihedral tubercles, arranged in 16—20 longitudinal series, the keels of the outer ones indistinct; the diameter of the largest tubercles on the flanks exceeds the diameter of the ear-opening. Ventral scales larger than those on the throat, cycloid, imbricate. Male with 7—20 femoral pores on each side. Tail depressed, annulate, with

rows of 8 or 6 spine-like tubercles, below with a series of transversely dilated plates. Limbs granular, the upper part of the hind limb with large keeled tubercles; digits free, dilated, the free distal joint long, 3—6 lamellae under the inner, 6—8 under the median toes.

Yellowish-brown above with irregular dark spots; one or two dark lines on the side of the head, passing through the eye; lips with dark bars. Lower parts white; all the scales finely dotted with dark brown. Young specimens have cross lines of white tubercles on the back; those on the tail all white. Length of head and body 58 mm.; tail 60 mm.

**H a b i t a t :** Borneo (Kuching, Sarawak); Flores!; Ombaai!; Rotti! (types of *H. tenkatei*). — Singapore; India; S. China; Tropical Africa.

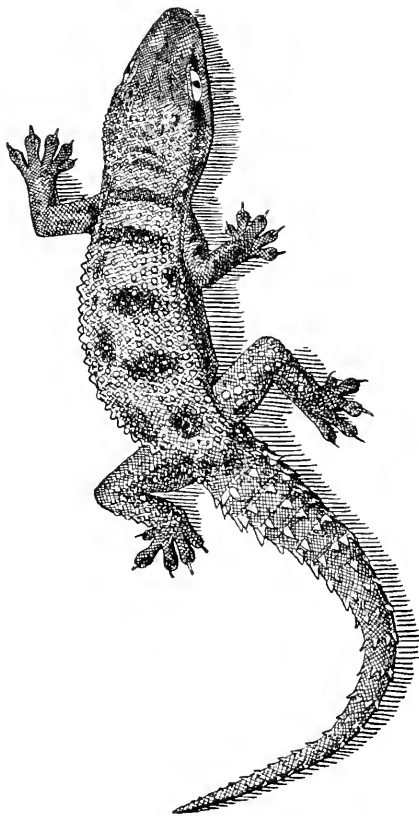


Fig. 20. *Hemidactylus brooki* Gray.

##### 5. *Hemidactylus garnoti* Dum. & Bibr.

*Hemidactylus Garnotii*, Dum. & Bibr., *Erp. Gén.* III 1836, p. 368.

*Hemidactylus garnotii*, Boulenger, *Cat. Liz.* I 1885, p. 141 (s. syn.).

Snout rounded, longer than the distance between the eye and the ear-opening, one and a half to one and two thirds the diameter of the orbit; forehead slightly concave; ear-opening small, rounded. Rostral quadrangular, with median cleft; nostril bordered by the rostral and three nasals. Twelve or thirteen upper and nine to eleven lower labials; mental large, triangular; two pair of chin-shields, the median pair in contact with each other, the posterior pair separated from the

labials. Body moderate; a slight fold on the side and another on the posterior side of the hind limb; body and throat covered with very small granular scales, largest on the snout. Ventral scales imbricate. Male with 7—19 femoral pores on each side.

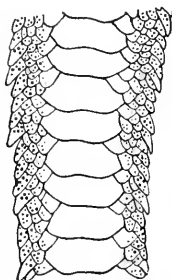


Fig. 21. *Hemidactylus garnoti*  
D. B. Lower view of tail  $\times 3\frac{1}{2}$ .

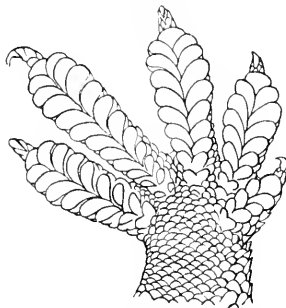


Fig. 22. *Hemidactylus garnoti*  
D. B. Fore limb  $\times 5$ .

Tail depressed, flat below, with sharp denticulated lateral edge; the scales on the upper surface small, equal; those below larger, imbricate, with a median series of transversely dilated plates (fig. 21). Limbs moderate; digits with a rudiment of web, dilated, inner well developed (fig. 22); 5—7 oblique lamellae under the inner digits, 10 to 12 under the fourth finger, 11 to 14 under the fourth toe.

Brownish-grey above, uniform or with brown and whitish spots. Lower parts whitish. Length of head and body 60 mm.; tail 80 mm.

**Habitat:** Nias!; Sumatra (Tilatang!, Fort de Kock!, Matur!, Indragiri, Bingin Telok, Palembang, Agam); Java (Buitenzorg, Malang!, Willis Mts., 5000 feet); Borneo (Kina Balu). — Malacca; Burma; Sikkim; Philippines; Solomon Islands; New Caledonia; Hawaii; Tahiti.

A common house-gecko in Sumatra.

## 6. *Hemidactylus platyurus* (Schneider).

*Stellio platyurus*, Schneider, Amph. Phys. II 1790, p. 30.

*Hemidactylus platyurus*, Boulenger, Cat. Liz. I 1885, p. 143 (s. syn.).

*Cosymbotus platyurus*, Barbour, Mem. Mus. Comp. Zool. Harvard Coll. XLIV 1912, p. 81.

Snout longer than the distance between the eye and the ear-opening, one time and a half the diameter of the orbit; forehead concave; ear-opening small, oval, oblique. Rostral four-sided,

not twice as broad as high, with median cleft above; nostril bordered by the rostral, the first labial and three nasals. Nine to eleven upper and seven or eight lower labials; mental large, triangular or pentagonal; two pair of chin-shields, the median pair large, in contact with each other, the posterior pair small, sometimes separated from the labials. Body depressed, covered above with uniform small granules, largest on the snout; a dermal expansion from axilla to groin and another along the posterior side of the hind limb. Ventral scales cycloid, imbricate. Male with an uninterrupted series of 34—36 femoral pores. Tail depressed, flat inferiorly, with sharp denticulated lateral edge, covered above with uniform small granules, below with a median series of transversely dilated plates. Limbs moderate, depressed; digits strongly dilated, about half-webbed (fig. 24), inner well developed; 3 to 6 lamellae under the inner, 7 to 9 under the median digits.

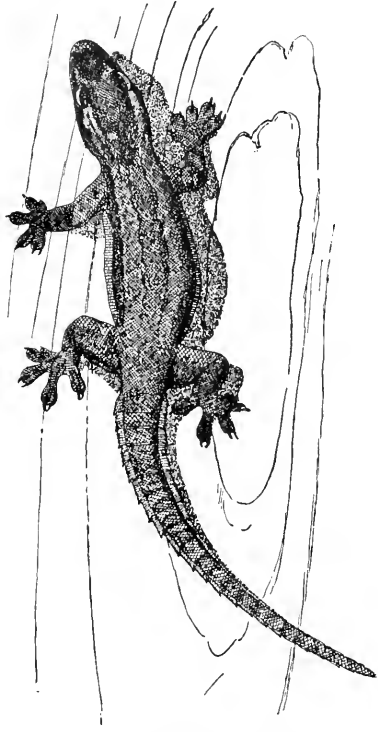


Fig. 23. *Hemidactylus platyurus* (Schn.).

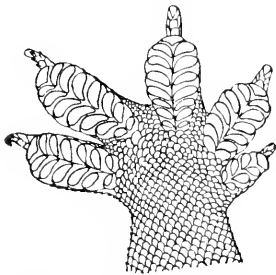


Fig. 24. *Hemidactylus platyurus* (Schn.). Fore limb  $\times 5$ .

Grey above, marbled with darker grey; generally a dark streak from eye to shoulder. Lower parts white. Length of head and body 61 mm.; tail 66 mm.

Habitat: Nias; Sumatra (Deli!, Taluk!, Gunung Sahilan!, Fort de Kock!, Batang Singalang!, Palembang); Riou; Singkep; Banka; Biliton; Java (Batavia!, Buitenzorg, Ngawi, Semarang!, Ungaran!); Borneo (Pontianak, Kapuas river, Sarawak, Kuching, Sintang, Sawa, Brunei, Labuan, Bandjermassin); Celebes (Manado, Buol, Pare Pare!, Tempe!, Kandari, Macassar!); Lombok!

Flores!; Gr. Bastaard; Sumba!; Savu; Kei Islands; Aru Islands; Halmahera; New Guinea (Sorong). — Malacca; Burma; Himalayas; Ceylon; South China; Indo-China; Philippines.

#### Doubtful species.

*Hemidactylus tristis*, described by Sauvage, Bull. Soc. Philom. (7) III 1878, p. 49, is said to be very much like *H. frenatus*, differing only in the following points: no tubercles on the base of the tail; granules of the tail much smaller. Probably *H. frenatus* D. B.

Habitat: New Guinea.

#### 5. *Mimetozone* Boulenger.

(BOULENGER, Proc. Zool. Soc. London p. 767, 1896).

Digits webbed for two-thirds, strongly dilated, with two rows of lamellae beneath; the distal phalanges clawed, slender and compressed, rising from within the extremity of the dilated part. Limbs, sides of head, body and tail with a large dermal expansion, covered above with imbricate tetragonal scales. Body covered with juxtaposed granular scales and tubercles. Pupil vertical. Males with femoral pores.

Distribution. Penang; Borneo.

A single species.

#### 1. *Mimetozone craspedotus* (Mocq.).

*Hemidactylus craspedotus*, Mocquard, Le Naturaliste XII 1890, p. 145; Nouv.

Arch. Mus. (3) II 1890, p. 126, pl. VII fig. 2; Bull. Soc. Philom. Paris (8)

IX 1896/97, p. 20.

*Mimetozone floweri*, Boulenger, Proc. Zool. Soc. London 1896, p. 767, pl. XXXVI.

Snout narrow, pointed, longer than the distance between the eye and the ear-opening, one time and a half the diameter of the orbit; forehead concave; ear-opening small, oval, horizontal. Head-scales small, largest on the snout. Rostral rectangular, twice as broad as high, with median cleft; nostril bordered by the rostral, the first labial and three nasals. Eleven to twelve upper and eight to ten lower labials; mental very large, triangular; two pair of chin-shields, the inner larger and forming a suture. Body depressed; from axilla to groin a membrane borders the flanks, another the neck from behind



the corner of the mouth to the fore limb; body covered above with very small granules, intermixed with small unequal round tubercles, irregularly distributed. Along the flanks a longitudinal series of tubercles, another, consisting of 7 or 9 tubercles along the neck. Ventral scales small, cycloid, imbricate. Male with 16 or 17 femoral pores on each side, separated in the middle. Tail much depressed, bordered on each side by a broad fold with sharp denticulated lateral edge, covered above with granules, anteriorly with transverse series of tubercles, below with enlarged plates. Limbs depressed, bordered on both sides by a membrane; digits short, strongly dilated, two-thirds webbed, all well developed; 5 lamellae under the inner, 8 or 9 under the fourth digit.

Grey-brown above, mottled with brown, with quadrangular paired, brown spots; a dark streak on each side of the head, passing through the eye; tail with brown cross bars. Lower parts yellowish-grey, speckled with blackish towards the sides; lower anterior part of tail red. Length of head and body 59 mm.; tail 64 mm.

Habitat: Borneo! (Kuching-Sarawak). — Penang! (2200 feet).

### 6. *Gehyra* Gray.

(GRAY, Zool. Misc. p. 57, 1842).

Digits strongly dilated, free or webbed at the base, below with undivided (fig. 27) or medially divided transverse lamellae (fig. 26); distal phalanges free, elongate, compressed, clawed, rising from within the extremity of the dilated part; inner digits without free distal phalange, clawless, or with a very indistinct

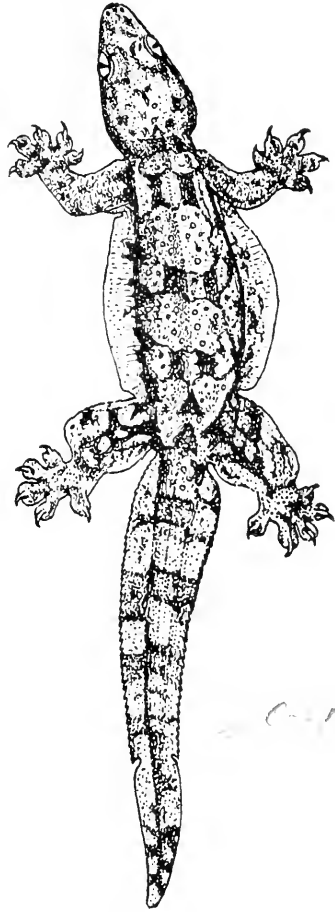


Fig. 25. *Mimotozoon craspedotus* (Mocq.). (After Boulenger).

retractile claw. Body covered above with granular scales, beneath with cycloid imbricate scales. Pupil vertical. Males with femoral or praeanal pores.

Distribution. The East-Indies; Australia; islands of the Indian and Pacific Oceans; Mexico.

### Key to the Indo-Australian species.

A. Digital lamellae divided by a median groove (fig. 26).

I. A fold of the skin bordering the hind limb posteriorly.

a. A distinct fold on each side between axilla and groin.

1. Tail flat; 7—8 lamellae under the median toes, the terminal lamella undivided. . . . . 1. *G. bechei* p. 39.
2. Tail flat; 12—13 lamellae under the median toes, 4 or 5 proximal ones undivided. . . . . 2. *G. lampei* p. 39.
3. Tail round; 15 lamellae under the median toes . . . . . 3. *G. interstitialis* p. 40.

b. No fold along the side of the body.

1. Inner pair of chin-shields very large; rostral quadrangular . . . . . 4. *G. mutilata* p. 41.
2. Chin-shields shorter; rostral horseshoe-shaped. . . . . 5. *G. baliola* p. 42.

II. Hind limb without cutaneous fold. Digits free

or with a rudiment of web . . . . . 6. *G. variegata* p. 43.

B. Digital lamellae undivided (fig. 27).

a. Digits webbed at the base; tail round; 25—46

femoral pores . . . . . 7. *G. oceanica* p. 44.

b. Digits half-webbed; tail with lateral edge; 34—35

femoral pores . . . . . 8. *G. marginata* p. 44.

c. Digits webbed at the base; a fold bordering the

fore limb anteriorly; tail round; 50—70 femoral pores . . . . . 9. *G. vorax* p. 45.

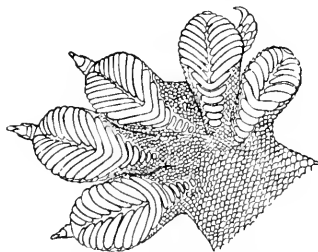


Fig. 26. *Gephyra mutilata* (Wieg.).  
Fore limb  $\times 3$ .

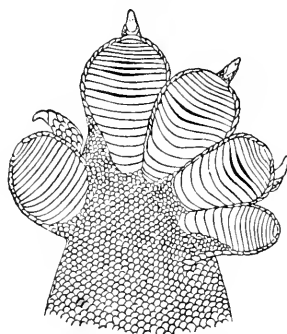


Fig. 27. *Gephyra oceanica* (Less.).  
Fore limb  $\times 9$ .

1. *Gehyra beebei* Annandale.

*Gehyra beebei*, N. Annandale, Rec. Ind. Mus. Vol. IX part V 1913, p. 306, pl. XV fig. 2.

Head ovate, flattened; snout rounded, a little longer than the distance between the eye and the ear-opening; forehead flat; ear-opening nearly round, about half as large as the eye. Nostril bordered by the rostral, the first labial and two larger and flatter scales. Ten upper and eight lower labials; mental pointed, but not produced; two pair of large chin-shields, followed by several smaller ones, the first pair forming a very long suture behind the mental. Body stout, depressed, covered with small uniform, convex granules; a distinct fold of the skin on each side of the body. Ventral scales small, flat, imbricate. Tail flat, swollen at the base, tip pointed, covered above with imbricate scales, below with a single series of transverse plates. Limbs short, flattened, with a distinct fold along their posterior margins; digits of fore limbs free, of hind limbs with a small web; infradigital lamellae curved and, the terminal lamella excepted, divided by a median groove, the proximal ones separated by one or more minute scales; 8 under the median and inner toes, 6 under inner and 7 under median fingers.

Pinkish-grey above, with numerous small paler dark-edged ocelli on the back. Lower parts suffused with black pigment, which becomes strong on the digital lamellae and on some scales and transverse plates below the tail. (After Annandale, not seen by me). Measurements?

Habitat: Borneo (Kapit-Sarawak).

2. *Gehyra lampei* Andersson.

*Gehyra lampei*, Andersson, Jahrb. Nassau. Ver. Naturk. 66 1913, p. 67.

Head much more long than broad; snout longer than the distance between the eye and the ear-opening, about one and a half time the diameter of the orbit; forehead concave; ear-opening small, longitudinally oval. Rostral quadrangular, more broad than high, with a broad angular cleft above; nostril bordered by the rostral, the first labial, a large supranasal and two small nasals; supranasals separated by small scales, three in the rostral cleft; twelve upper labials, gradually decreasing, ten lower labials,

last three minute; mental pentagonal; three pair of chin-shields, the inner longest and in contact; below them a row of small irregular plates. Body depressed; a small cutaneous fold from below the ear along the side of the neck and the fore limb, another between axilla and groin and a well developed fold bordering the hind limb posteriorly; back covered with very small flat, granular scales, smallest in the vertebral region. Ventral scales moderate, twice as large as the gular scales. Male with a long angular series of 32 oval femoral pores. Tail much depressed, with a sharp, minutely serrated lateral edge, covered above with small flat scales in transverse rows, below with a median series of large transverse plates. Limbs flattened; digits short and broad, webbed as far as the broad discoidal part; infradigital lamellae numerous, undivided proximally, divided by a median groove distally; median fingers with 6 divided, 2 semi-divided and 6 or 7 undivided lamellae; median toes with 6 or 7 divided, 10 or 11 single ones; inner digit well developed, thumb clawless, inner toe with a very small claw.

Greyish-brown above, with small irregular dark dots, some arranged along the median line of the tail. Lower parts greyish-white, more dusky on the tail. Length of head and body 60 mm.; tail 56 mm. (After Andersson, not seen by me).

Habitat: New Guinea (Bogadjim on Astrolabe Bay).

### 3. *Gehyra interstitialis* Oudemans.

*Gehyra interstitialis*, Oudemans, in Semon's Zool. Fors. Bd. V 1894, p. 134.

*Peropus interstitialis*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 81.

Head more long than broad; snout longer than the distance between the eye and the ear-opening, about one and one third time the diameter of the orbit; forehead concave; ear-opening moderate, suboval, oblique. A slight fold between the corner of the mouth and the fore limb, a stronger one between axilla and groin and one bordering the hind limb posteriorly. Rostral four-sided, twice as broad as high, with median cleft; nostril bordered by the rostral, the first labial and three or four nasals, the median large, but not in contact with its fellow. Nine to eleven upper and seven to nine lower labials; mental triangular; three pair of chin-shields, inner largest and form-

ing a suture, shorter than those in *G. mutilata*. Back covered with small granules. Ventral scales rather small, flat, imbricate, those on the throat not much smaller. Male with 50 round femoral pores in a curved line, angular in the middle. Tail round, somewhat depressed at the base, covered above with equal, small scales, beneath with a median series of large, transversely dilated scales. Digits webbed at the base, infradigital lamellae divided, 15 under the median toe. Inner toe with a small, retractile claw, thumb clawless.

Greyish or brownish above, with numerous small whitish spots on head and back. Limbs with light spots confluent into cross lines; a white spot on the base of each digit. Tail with small white cross lines. Lower parts uniform brownish or greyish-white, each scale dotted with dark brown. Length of head and body 61 mm.; tail 55 mm.

Type-specimen examined in the Amsterdam Museum.

Habitat: New Guinea! (Fak Fak, Stekwa river, Kaiserin-Augusta river!, Bongu on Astrolabe Bay, Sattelberg).

#### 4. *Gehyra mutilata* (Wiegman).

*Hemidactylus (Peropus) mutilatus*, Wiegman, Nov. Acta Ac. Leop. Carol. XVII 1835, p. 238.

*Gehyra mutilata*, Boulenger, Cat. Liz. I 1885, p. 148 (s. syn.).

*Peropus mutilatus*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 81.

Head more long than broad; snout longer than the distance between the eye and the ear-opening, about one and one third time the diameter of the orbit; forehead concave; ear-opening moderately large, suboval. Rostral quadrangular, more broad than high, with a median cleft above; nostril bordered by the rostral, the first labial and three nasals, the top one the largest and generally in contact with its fellow. Eight to eleven upper and six to nine lower labials; mental large, pentagonal. Three pair of chin-shields, inner very large, elongate, forming a long suture, outer small, often broken up into small scales (fig. 28); the distance from the border of the lip to the extremity of the median chin-shields equals the diameter of the orbit. Upper surfaces and throat covered with small granular scales, largest and flat on the back. Ventral scales large, imbricate. Male with 14 to 22 oval femoral pores on each side in a double curved line, angular in the middle. Tail depressed, with a

sharp, finely denticulated lateral edge; covered above with very small flat scales, below with a median series of large transversely dilated plates. Limbs depressed; a fold of the skin bordering the hind limb posteriorly; digits short, webbed at the base; the lamellae angular, divided by a median groove (fig. 26).

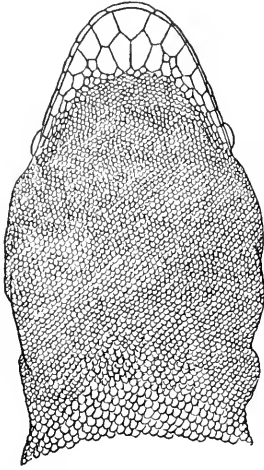


Fig. 28. *Gehyra mutilata* (Wiegman). Chin-shields and throat  $\times 2$ .

Greyish or reddish-brown above, uniform or variegated with darker brown, sometimes with round white spots on the back in regular longitudinal series. Lower parts dirty white. Length of head and body 98 mm; tail 96 mm.

Habitat: Nias!; Engano; Sumatra (Medan!, Singkarak!, Redjang, Gunung Sahilan!); Banka; Borneo (Pontianak, Gunung Kenepai, Sintang, Rivers Howong, Upper Mahakkam and Baram, Kuching, Kidi district, Banting, Kina Balu, Sandakan); Celebes (Rurukan, Manado, Buol, Kema, Macassar!); Java (Buitenzorg!, Surabaya); Flores!; Rotti!; Timor!; Sumba; Ombai; Timor Laut; Kei Islands; Aru Islands; Ambon!; Goram; Halmahera; Ternate; Batjan; Waigeu!; New Guinea (lake Sentani!, Lorentz river!, Merauke!, Kaiserin-Augusta river!, Astrolabe Bay, Berlinhafen, Seleo Island, Katow). — Malacca; Andamans; Nicobars; Burma; Siam; Ceylon; Philippines; Mascarene Islands; Seychelles; Madagascar; Mauritius; Mexico; Cuba; d'Entrecasteaux Archipelago; Bismarck Archipelago; Polynesia.

House-gecko.

##### 5. *Gehyra baliola* (A. Dum.).

*Hemidactylus baliolus*, A. Duméril, Cat. Méth. Rept. 1851, p. 38; Arch. Mus. VIII 1855/56, p. 461, pl. XVII fig. 2.

*Gehyra baliola*, Boulenger, Cat. Liz. I 1885, p. 150.

Head more long than broad, snout conical, cheeks not swollen; forehead concave; ear-opening large, oval, oblique. Head granular, the granules enlarged on the snout. Rostral horseshoe-shaped; nostril bordered by the rostral, the first labial, a

nasal and two or three smaller scales. Eleven upper and ten lower labials; mental triangular, not much larger than the labials; three pair of chin-shields, median longest, in contact. Body depressed; granular. Ventral scales large, cycloid, imbricate. Male with 18 femoral pores in an angular series. Tail depressed, with a sharp lateral edge, covered above with small scales, below with transversely enlarged ones. Limbs depressed; digits short, webbed at the base; the lamellae angular, divided by a median groove; a fold of the skin bordering the hind limb posteriorly.

Greyish-brown above, with reddish spots, a reddish-brown streak from the eye to the nape. Lower parts dirty white. Length of head and body 99 mm.; tail 74 mm.

Habitat: New Guinea!.

## 6. *Gehyra variegata* (Dum. & Bibr.).

*Hemidactylus variegatus*, Dum. & Bibr., *Exp. Gén.* III 1836, p. 353.

*Gehyra variegata*, Boulenger, *Cat. Liz.* I 1885, p. 151 (s. syn.).

Head more long than broad; snout longer than the distance between the eye and the ear-opening, about one and a half time the diameter of the orbit; forehead concave; ear-opening moderate, suboval, oblique. Rostral quadrangular, more broad than high, with a median cleft; nostril bordered by the rostral, the first labial and three large nasals. Seven to nine upper and six to eight lower labials; mental pentagonal; three pair of chin-shields, inner large, forming a long suture, outer small, often broken up into small scales, shorter than those in *G. mutilata*. Body depressed; back and throat covered with very small granules. Ventral scales moderate, flat, imbricate. Male with a short angular series of 10 to 16 femoral pores. Tail depressed, tapering, the sides rounded, covered above with very small flat scales, below with a median series of transversely dilated scales. Limbs elongate, depressed, no cutaneous folds; digits short, free or with a slight rudiment of web; the inferior lamellae angular, divided by a median groove, 12 under the median toes.

Brown or greyish above, variegated with darker brown, the dark lines sometimes forming a network, sometimes dark with lighter blotches, or with dark bands across the back; two dark streaks on the side of head and neck, the lower passing through

the eye. Lower parts uniform dirty white, each scale dotted with brown. Length of head and body 71 mm.; tail 76 mm.

Habitat: New Guinea (Fly River!, Fife Bay). — Australia; Polynesia.

### 7. *Gehyra oceanica* (Lesson).

*Gecko oceanicus*, Lesson, Voyage Coquille II I, 1830, p. 42, pl. II fig. 3.

*Gehyra oceanica*, Boulenger, Cat. Liz. I 1885, p. 152 (s. syn.).

*Peropus oceanicus*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 81.

Head more long than broad; snout longer than the distance between the eye and the ear-opening, about one and a half time the diameter of the orbit; forehead concave; ear-opening moderate, oval, horizontal. Rostral large, quadrangular, emarginate above; nostril bordered by the rostral, the first labial and four or five small nasals. Eleven to thirteen upper and nine to twelve lower labials, mental small, variably shaped; three pair of chin-shields, inner pair long. Body depressed; a fold of the skin along the side of the throat and belly, another bordering the hind limb posteriorly; back and throat covered with very small granules. Ventral scales moderate, flat, imbricate. Male with an angular series of 13—23 femoral pores on each side. Tail rounded, tapering, slightly depressed, covered above with very small juxtaposed scales, below with larger scales. Limbs depressed; digits webbed at the base; the inferior lamellae undivided, curved (fig. 27).

Brown above, uniform or marked with darker and lighter tints. Lower parts whitish. Total length 240 mm.

Habitat: Sumatra? <sup>1)</sup>; Ternate; Halmahera; Kei Islands; New Guinea (Mt. Epa, Dorei, Mosso river!, Djamna, Astrolabe Bay, Fife Bay, Yule Island); Schouten Islands (Mysore). — Bismarck Archipelago; Solomon Islands; Admiralty Islands; Queensland; Santa Cruz; New Hebrides; Polynesia.

House-gecko. The eggs are white; they have a length of 12—13 mm. and a breadth of 10—11 mm. As they are laid on the ground, they have no flat surfaces.

### 8. *Gehyra marginata* Boulenger.

*Gehyra marginata*, Boulenger, Cat. Liz. III 1887, p. 486.

*Gehyra marginata*, Boettger, Zool. Anz. XVIII, 1895, p. 116.

1) Werner, Verh. Ges. Wien XLVI 1896 p. 12. If really captured in Sumatra, the specimen, mentioned by Werner, most probably imported from the eastern part of the archipelago.



Head more long than broad; snout longer than the distance between the eye and the ear-opening, about one and a half time the diameter of the orbit; forehead concave; ear-opening rather small, oval, horizontal. Rostral large, quadrangular, more broad than high, with a median cleft above; nostril bordered by the rostral, the first labial and four nasals, the upper one largest, and separated from its fellow. Thirteen to fifteen upper and twelve to fourteen lower labials, mental small, pentagonal; three pair of chin-shields, inner largest and forming a suture. Body elongate, depressed, a fold of the skin along the side of the throat and fore limb anteriorly, a stronger one bordering the fore limb posteriorly, along the side of the belly and hind limb anteriorly, and a third bordering the hind limb posteriorly. Upper surfaces and throat covered with round flat scales, those on the throat smaller. Ventral scales rather small, flat, imbricate. Male with 34 femoral pores in a curved line, angular in the middle. Tail depressed, angular laterally, covered above with small juxtaposed scales, below with larger ones, distinctly annulate, 10—12 rows of scales in each annulus above, 3 or 4 below. Limbs depressed; digits half-webbed, inferior lamellae undivided, curved.

Brown above with irregular reddish-brown markings; a reddish-brown streak on the side of head and neck, passing through the eye. Lower parts brownish-white. Length of head and body 130 mm.; tail 100 mm.

Habitat: Ternate!; Halmahera; Morotai!; Kei Islands.

#### 9. *Gehyra vorax* Girard.

*Gehyra vorax*, Girard, Proc. Ac. Philad. 1857, p. 197; U. S. Explor. Exp. Herp. p. 274, pl. XVI fig. 1—8.

*Gehyra vorax*, Boulenger, Cat. Liz. I 1885, p. 153.

Head more long than broad; snout twice the diameter of the orbit; forehead concave; ear-opening oval, oblique. Rostral large, quadrangular, more broad than high; nostril bordered by the rostral, the first labial, a large nasal and three or four scales. Thirteen or fourteen upper and twelve lower labials, mental not larger than the labials, pentagonal; two pair of chin-shields, inner longer and forming a suture, followed by smaller shields on each side. Body stout, depressed; a fold of the skin on each side of the neck and continued on the fore

limb anteriorly, another along each side of the belly, bordering the fore limb posteriorly and the hind limb anteriorly, a third fold on the posterior margin of the hind limb. Back and throat covered with granular scales. Ventral scales flat, imbricate, larger than dorsals. Male with a curved series of 25—35 femoral pores on each side, angular in the middle. Tail rounded, a little depressed, covered above with small juxtaposed scales, below with much enlarged ones. Limbs rather short, depressed; digits broad, webbed at the base; the infradigital lamellae not much curved, undivided.

Greyish-brown above, uniform or with dark brown transverse bands or dark and light spots; hind limb of males orange-yellow posteriorly. Lower parts yellowish. Length of head and body 152 mm.; tail 108 mm.

Habitat: New Guinea (Albert Edward Range).—Loyalty Islands; Norfolk Islands; New Hebrides; Fiji Islands.

Tree-gecko.

## 7. *Hemiphyllodactylus* Bleeker.

*Hemiphyllodactylus* Bleeker, Nat. Tijdschr. Ned. Ind. XX 1860, p. 327.

*Spathodactylus* Günther, Proc. Zool. Soc. 1872, p. 594.

*Spathoscalabotes* Boulenger, Cat. Liz. I 1885, p. 156.

*Hemiphyllodactylus* Boulenger, Ann. Nat. Hist. (5) XX 1887, p. 152.

Digits slender, cylindrical at the base, the penultimate joint ending in a strong dilatation with two series of oblique lamellae below, separated by a median groove (fig. 30); the thumb rudimentary, clawless. The other digits with a free, clawed terminal phalange projecting a good deal beyond the dilated part. Body covered above with juxtaposed or subimbricate granular scales; below with imbricate scales. Pupil vertical. Males with praeanal pores.

Distribution. Western part of the Archipelago.

A single species.

### 1. *Hemiphyllodactylus typus* Bleeker.

*Hemiphyllodactylus typus*, Bleeker, Nat. Tijdschr. Ned. Ind. XX 1860, p. 327.

*Spathodactylus mutilatus*, Günther, Proc. Zool. Soc. 1872, p. 594.

*Spathoscalabotes mutilatus*, Boulenger, Cat. Liz. I. 1885, p. 157, pl. XIII fig. 1.

*Hemiphyllodactylus typus*, Boulenger, Ann. Nat. Hist. (5) XX 1887, p. 152.

Head more long than broad, oviform; snout as long as the distance between the eye and the ear-opening, one time and a

half the diameter of the eye; ear-opening very small, oval, oblique. Rostral broad, nearly pentagonal; nostril bordered by the rostral, the first labial, a supranasal and two or three small scales. Eleven upper and as many lower labials; mental small, triangular; no chin-shields. Body long and slender; covered with small granular scales, those on the snout and the limbs somewhat enlarged. Limbs slender;

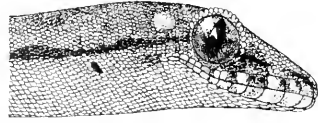


Fig. 29. *Hemiphyllodactylus typus*  
Blkr.  $\times 4$ .

digits very unequal, free (fig. 30); inner rudimentary; four pair of lamellae under the other digits. Ventral scales larger, smooth, imbricate. Male with an angular series of 15 praeanal pores. Tail cylindrical, slender, covered with small scales.

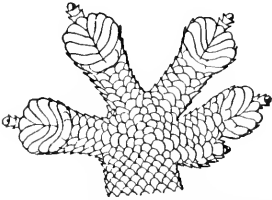


Fig. 30. *Hemiphyllodactylus typus* Blkr. Fore limb  $\times 8$ .

Brown above, marbled with darker; a dark streak from the tip of the snout to the shoulder, passing through the eye; a series of round whitish spots beginning behind the eye and continued along each side of the body to the

tail. Tail lighter brown above with two whitish elongate spots at its base, white below for two thirds of its length. Lower parts of body whitish, speckled with brown. Length of head and body 44 mm.; tail 38 mm.

Habitat: Simalur!; Nias!; Sumatra (Deli!, Muara Labu, Agam, Fort de Kock!); Borneo; Java (Buitenzorg, Nongkodjajar in Tengger Mts. 1300 M.!, Gunung Parong).

### 8. *Lepidodactylus* Fitz.

(FITZINGER, Syst. Rept. p. 98, 1843).

Digits dilated, free or with a rudiment of web; below with transverse lamellae, divided by a median groove (fig. 32). A very short compressed distal clawed joint rising from the extremity of the dilated part; inner digit without a claw. Body covered above with granular scales, below with juxtaposed or subimbricate scales. Pupil vertical. Males with praeanal or femoral pores.

Distribution. The East Indies; Islands of the Pacific; South-West Australia; Polynesia.

## Key to the Indo-Australian species.

- A. First finger rudimentary; digits free . . . . . 1. *L. ceylonensis* p. 48.
- B. First finger well developed.
- I. Tail flat inferiorly, with sharp lateral edge.
- Male with femoral pores . . . . . 2. *L. lugubris* p. 49.
- II. Tail cylindrical.
- a. Digits webbed at the base.
1. 18—20 lamellae under the median toes.
- Male with 17 praeanal pores . . . . . 3. *L. pulcher* p. 49.
2. 11 lamellae under the median toes.
- Male with a series of 44 femoral and praeanal pores . . . . . 4. *L. guppyi* p. 50.
- b. Digits without distinct web. Tail somewhat depressed, rounded. Male with 25 femoral and praeanal pores . . . . . 5. *L. woodfordi* p. 51.

1. *Lepidodactylus ceylonensis* Boulenger.

*Lepidodactylus ceylonensis*, Boulenger, Cat. Liz. I 1885, p. 164, pl. XIII fig. 3.

Head much more long than broad; snout as long as the distance between the eye and the ear-opening, one time and a half the diameter of the orbit; ear-opening small, oval. Head covered with very small granular scales, slightly enlarged on the snout. Rostral twice as broad as deep; nostril bordered by the rostral, the first labial and three small scales. Eleven or twelve upper and as many lower labials; mental small, triangular; no chin-shields. Body long, covered with small granules. Ventral scales somewhat larger and flat. Male with 11 praeanal pores in an angular series. Tail cylindrical, covered with uniform small scales. Limbs short, fore limb not measuring half the distance between axilla and groin; digits free, inner rudimentary; 4 or 5 divided lamellae under the median toes.

Brown above, with small round yellowish spots; a dark streak from the tip of the snout to the shoulder, passing through the eye, bordered above by light brown; a small light spot on each digit. Lower parts dirty white, dotted with brown. Length of head and body 47 mm.; tail 38 mm.

Habitat: Engano; Sumatra (Fort de Kock!, Matur!); Java (Willis Mts 5000 feet); Borneo (Sandakan). — Malacca; Burma; Ceylon.

## 2. *Lepidodactylus lugubris* (Dum. & Bibr.).

*Platydactylus lugubris*, Dum. & Bibr., *Erp. Gén.* III 1836, p. 304.

*Lepidodactylus lugubris*, Boulenger, *Cat. Liz.* I 1885, p. 165 (s. syn.).

Head much more long than broad, snout pointed, longer than the distance between the eye and the ear-opening, one time and a half to twice the diameter of the orbit; forehead concave; ear-opening small, round. Head-granules very small, enlarged on the snout. Rostral broad, quadrangular; nostril bordered by the rostral, the first labial and two or three small shields, the upper separated from its fellow by one or three small scales. Eleven to fourteen upper and seven to eleven lower labials; mental small, smaller than the nearest labials; four transverse rows of small chin-shields. Body and throat covered with minute granules. Ventral scales larger, flat, juxtaposed or imbricate. Male with 25—31 femoral pores in a long angular series. Tail flat beneath, with sharp, sometimes serrated, lateral edge, covered with small flat, equal scales. Limbs moderate; digits with a rudiment of web, inner well developed; 7—8 lamellae under the fingers, 8—9 under the toes.

Light pinkish grey or brownish, generally a series of small blackish or brownish spots on each side of the vertebral line; a dark brown streak from the end of the snout to the ear, passing through the eye; labials finely dotted with brown. Lower surfaces white. Length of head and body 45 mm; tail 51 mm.

The eggs are laid on leaves (grass), two together, they measure 10 mm. by 7 mm. New-born specimens have more cylindrical tails.

**Habitat:** Riou (Bintang); Borneo (Sintang); Celebes (Tomohon, Rurukan, Kandari); Ambon; Halmahera; Ternate; Misol; Kei Islands; New Guinea (Dorei, Mansinam, Friedrich-Wilhelmshafen, Seleo Island, Fife Bay, Bogadjim, Stephansort); Schouten Islands (Mysore). — Malacca (Penang); Burma; Nicobars; Andamans; Bismarck Archipelago; Solomon Islands; Banks; New Hebrides; Sandwich Islands; Polynesia.

House-gecko.

## 3. *Lepidodactylus pulcher* Boulenger.

*Lepidodactylus pulcher*, Boulenger, *Cat. Liz.* I 1885, p. 166, pl. XIII fig. 5.

Differs from the preceding one on the following points:

Snout shorter. Male with 17 praeanal pores, forming a double-arched series. Tail cylindrical.

Pinkish-brown above, head with small black spots. Limbs and sides of the back speckled with blackish. Tail with dark transverse bars; throat and breast speckled with brown. Length of head and body 51 mm.; tail 54 mm.

Habitat: New Guinea (Trobriand Islands). — Admiralty Islands.

#### 4. *Lepidodactylus guppyi* Boulenger.

*Lepidodactylus guppyi*, Boulenger, Proc. Zool. Soc. 1884, p. 211; Cat. Liz. I 1885, p. 166.

Head small, oviform; snout one and one third time the diameter of the orbit, which equals its distance to the ear-opening; forehead concave; ear-opening small, round. Rostral quadrangular, more than twice as broad as high; nostril bordered by the rostral, the first labial and three scales. Eleven or twelve upper and as many lower labials; mental small, not much larger than the labials; three or four rows of small chin-shields. Body long, covered with uniform granular

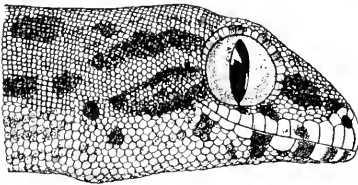


Fig. 31. *Lepidodactylus guppyi*  
Blgr.  $\times 5$ .

scales, those on the snout enlarged; ventral scales largest and flat, round, slightly imbricate. Male with a series of 44 femoral and praeanal pores. Tail cylindrical, tapering, covered with small equal flat scales. Limbs rather short; digits webbed at the base, inner well developed, 10 or 11 lamellae under the median digits, the two or three proximal divided (fig. 32).

Pinkish-brown above, sides with darker spots; two dark streaks on the side of the head behind the eye, one on the snout. Tail with dark annuli. Lower surface whitish, speckled with reddish-brown. Length of head and body 185 mm.

Habitat: New Guinea (Humboldt Bay!). — Solomon Islands.

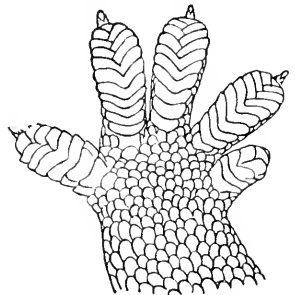


Fig. 32. *Lepidodactylus guppyi*  
Blgr. Fore limb  $\times 10$ .

5. *Lepidodactylus woodfordi* Boulenger.

*Lepidodactylus woodfordi*, Boulenger, Proc. Zool. Soc. 1887, p. 334 pl. 28, fig. 1;  
Cat. Liz. III 1887, p. 487.

Closely allied to the preceding one, from which it differs on the following points: Digits without distinct web. Tail a little depressed, rounded. Male with 25 femoral and praeanal pores.

Grey above, with zigzag black cross bands, bordered with light posteriorly, six between the nape and the base of the tail; a black streak from the nostril to the neck, passing through the eye and above the ear. Lower parts whitish. Length of head and body 40 mm.; tail 38 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Aroma!, Valise Island). — Solomon Islands.

9. *Gecko* Laurenti.

(LAURENTI, Syn. Rept. p. 43, 1768).

Digits strongly dilated, free or webbed, with undivided lamellae below (fig. 35), all clawed, except the inner one. Head and body covered above with juxtaposed granular scales or tubercles, below with small flat imbricate scales. Pupil vertical. Male with praeanal or femoral pores.

Distribution. Japan; China; the East-Indies; Philippine Islands.

## Key to the Indo-Australian species.

A. Rostral bordering the nostril (fig. 33 *c, d*).

I. Granules on the throat intermixed with larger ones; diameter of ear-opening half that of the orbit; male with 7—29 femoral pores on each side. 1. *G. vittatus* p. 52.

II. Granules on the throat equal.

*a.* Diameter of ear-opening one third that of the orbit; male with 16—20 femoral pores on each side. . . . . 2. *G. monarchus* p. 54.

*b.* Diameter of ear-opening nearly one third that of the orbit; male with 11 praeanal pores in an angular series, separated from 12 femoral pores on each side . . . . . 3. *G. pumilus* p. 54.

B. Rostral not bordering the nostril (fig. 33 *a, b*).

I. A scaled membrane on each side of the body, fringed on the edge; tail bordered with rounded lobes; digits fully half-webbed . . . . . 4. *G. rhacophorus* p. 55.

II. No membrane on the side of the body; tail depressed; digits free.

- a.* The width of the head equals twice the distance from the end of the snout to the orbit; throat covered with small flat granules; each annulus of the tail with 5—6 rows of scales above, 3 beneath . . . . . 5. *G. verticillatus* p. 56.
- b.* The width of the head equals less than twice the distance from the end of the snout to the orbit; throat minutely granulate; each annulus of the tail with 8—11 rows of scales above. . . . . 6. *G. stentor* p. 57.

### 1. *Gecko vittatus* Houttuyn.

*Gekko vittatus*, Houttuyn, Verh. Genootsch. Vliissingen IX 1782, p. 325.

*Gekko vittatus*, Boulenger, Cat. Liz. I 1885, p. 185 (s. syn.).

Head large, oviform; snout longer than the distance between the eye and the ear-opening, about one time and two thirds the diameter of the orbit; forehead concave, ear-opening oval, slightly oblique, its greatest diameter half that of the orbit. Head covered with rather large granules, largest on the snout. Rostral very large, twice as broad as high; nostril bordered by the rostral, the first labial and three nasals (fig. 33*d*). Twelve to sixteen upper and ten to fourteen lower labials; mental small, triangular, no chin-shields, the chin covered with polygonal scales. Body long and slender; back with very small juxtaposed granules, intermixed with slightly enlarged smooth tubercles; throat granular with enlarged tubercles. Ventral scales rather large, imbricate. Male with 14—58 femoral pores in an angular series. Tail cylindrical, depressed, annulate, covered above with very small flat granular scales, intermixed with round flat tubercles, below with larger scales; each annulus is composed of 12—14 rows of

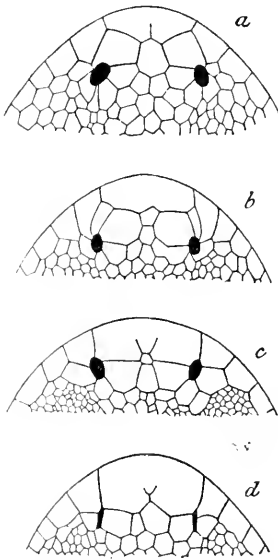


Fig. 33. Nostrils with surrounding shields.

- a.* *Gecko verticillatus* Laur.;  
*b.* *G. stentor* (Cant.);  
*c.* *G. monarchus* (D. B.);  
*d.* *G. vittatus* Houtt.

larger scales; each annulus is composed of 12—14 rows of



scales above, 3 to 5 beneath. Limbs long and slender; digits with a rudiment of web, strongly dilated, below with undivided curved lamellae.

Greyish-brown above; a white, dark-edged vertebral line, divided on the neck, extending to each eye. Tail with white annuli; if reproduced, the tail shows longitudinal lines of a dark brown and a whitish colour. Lower parts lighter, dotted with brown. Length of head and body 130 mm.; tail 135 mm.

Nom. indig. Tjitjak traban.

Habitat: Java (Preanger)?<sup>1)</sup>; Timor!; Ambon!; Ceram!; Goram; Buru!; Nusa Laut!; Pulu Kelang!; Batjan; Ternate!; Halmahera; Morotai!; Misol; Aru Islands; Kei Islands; Waigeu; New Guinea (Fak Fak, Mansinam, Dorei, Andai, Mt. Arfak, Koimé river!, Humboldt Bay!, Djamna, Lake Sentani!, Lorentz river!, Mimika river, Stekwa river, Fife Bay, Astrolabe Bay, Bogadjim, Sattelberg); Schouten Islands (Mysore); Jobi, Valise and Tumbler Islands. — Ferguson Island; Trobriand Island; St. Aignan; Rossel Island; Bismarck Archipelago; Solomon Islands; St. Cruz Islands.

Tree-gecko. The eggs are laid in pairs; they have a length of 13—14 mm., a breadth of 12 mm. and show one flat face.

Specimens with a violet tint and two brown stripes on the back, violet and brown bands on the tail have been named *Platydactylus bivittatus* by Dum. Bibr. (Erpét. Génér. III 1836 p. 334); they originated from New Guinea and Waigeu. Peters & Doria (Ann. Mus. Civ. Genova XIII 1878 p. 368) described specimens with fewer femoral pores, less numerous tubercles on the back, each annulus of the tail with 10—12 rows of scales above, 3—4 below, and a greyish-or reddish-brown colour, variegated with darker tints, a light vertebral band, sometimes indistinct on the neck and bordered by a blackish band. This form is given by Boulenger in his Catal. Liz. I 1885 p. 186 under the name of *Gecko vittatus* Houtt. var. *bivittatus*, found in New Guinea, Pelew and Solomon Islands, but it cannot be held up as a variety, for other examples show the morphological characters, named above, together with the coloration of a typical *vittatus*; it cannot be a geographical variety either, as the two forms occur both in the same islands.

1) The occurrence in W. Java of this species, quoted by Werner (Zool. Jahrb. Syst. XXVIII 1910 p. 286) seems doubtful to me (see Nelly de Rooy, Bydragen Dierkunde Afl. 19 1913, p. 21).

## 2. *Gecko monarchus* (Dum. & Bibr.).

*Platydactylus monarchus*, Dum. & Bibr., *Erp. Gén.* III 1836, p. 335.  
*Gecko monarchus*, Boulenger, *Cat. Liz.* I 1885, p. 187 (s. syn.).

Head moderately large, oviform; snout longer than the distance between the eye and the ear-opening, about one time and two thirds the diameter of the orbit; forehead concave; ear-opening oval, oblique, its greatest diameter one third that of the orbit. Head granular, the granules enlarged on the snout; small tubercles on the occiput. Rostral large; nostril bordered by the rostral, the first labial and three nasals (fig. 33 *c*). Ten or eleven upper and nine or ten lower labials; mental triangular, small; a large median pair of chin-shields, twice as long as the mental, followed by a few smaller shields. Body granular, with numerous rounded conical tubercles; throat with small flat scales. Ventral scales moderately large, imbricate. Male with a long curved series of 32—40 femoral pores. Tail cylindrical, slightly depressed, annulate, covered above with small granules, below with a median series of transversely dilated plates; each annulus is composed of 12—14 rows of scales above, 3 or 4 below; six longitudinal series of flat tubercles above. Limbs granular; digits with a rudiment of web, not very much dilated, inferiorly with undivided curved lamellae.

Brown or grey, spotted with darker tints, a double series of spots along the middle of the back; tail with darker and lighter bands. Lower parts whitish, each scale finely dotted with dark brown. Length of head and body 95 mm.; tail 110 mm.

**Habitat:** Simalur!; Nias!; Mentawai Islands (Saibi!); Sumatra (Deli!, Langkat, Bingin Telok, Belanie, Palembang!, Taluk!, Gunung Sahilan!, Matur!, Fort de Kock!); Java; Borneo! (Matang, Pontianak, Sintang, Kuching, Sarawak, Undup, Sandakan, Baram district, Bandjermassin, Labuan, Mulu, Mt. Dulit); Celebes (Manado, Macassar, Kandari); Ambon!; Ceram; Misol; Aru Islands; Kei Islands. — Malacca; Ceylon; Philippines.  
 House-gecko.

## 3. *Gecko pumilus* Boulenger.

*Gecko pumilus*, Boulenger, *Ann. Nat. Hist.* (5) XVI 1885, p. 473; *Cat. Liz.* III 1887, p. 488.

Head small; its width equals the distance from the end of

the snout to the orbit posteriorly; snout one time and a half the diameter of the orbit; forehead slightly concave; ear-opening very small, roundish. Head covered with uniform small granules, much larger on the snout. Rostral quadrangular, not quite twice so broad as high, with a median cleft above; nostril bordered by the rostral, the first labial and three enlarged nasals. Eleven to twelve upper and nine or ten lower labials; mental small, triangular, not larger than the labials; three or four transverse rows of small hexagonal chin-shields. Body elongate, covered with small granules above. Ventral scales small, rounded, imbricate. Male with a short angular series of 11 preanal pores, separated from 12 femoral pores on each side. Tail cylindrical, slightly depressed at the base, covered with uniform small flat scales, largest below. Limbs moderate; digits one third webbed, dilated, inferiorly with angularly curved, undivided lamellae, 10—12 under the median toes.

Pale reddish-brown above, with irregular dark brown spots, a dark line in the loreal region. Tail with dark markings. Belly brownish-white, many of the scales brown-dotted; throat and lips spotted with dark brown. Length of head and body 42 mm.; tail 44 mm.

Habitat: New Guinea (Merauke!, Port Moresby). — Murray Island.

#### 4. *Gecko rhacophorus* Boulenger.

*Gecko rhacophorus*, Boulenger, Ann. Nat. Hist (7) IV 1899, p. 451.

*Gecko rhacophorus*, Hanitsch, J. Straits. Asiat. Soc. XXXIV 1900, pl. 1 fig. 1.

Head moderately large, one and one third time as long as broad; snout longer than the distance between the eye and the ear-opening, one time and a half the diameter of the orbit; ear-opening round, its diameter one third that of the eye. Head, body and limbs covered with minute granules intermixed with small, round, smooth tubercles. Spine-like tubercles on the sides of the head, largest above the ear. Rostral a little more than twice as broad as deep, without median cleft; nostril bordered by several small scales. Nine upper and ten lower labials; mental small, pentagonal; a series of six small chin-shields. A moderately developed scalloped membrane on each side of the body, scaled like the body and fringed on the edge. Body much depressed. Ventral scales flat juxtaposed granules. An

angular series of praeanal pores. Tail depressed, scaled like the body, bordered with a series of rounded lobes. Limbs much depressed, bordered with dermal expansions, fingers and toes fully half-webbed.

Greyish above, speckled with darker and with wavy dark transverse lines. Brownish beneath, throat with darker dots. Length of head and body 65 mm.; tail 40 mm. (After Boulenger, not seen by me).

Habitat: Borneo (Kadamaian river-Kina Balu, 2100 feet).

### 5. *Gecko verticillatus* Laur.

*Gekko verticillatus*, Laurenti, Syn. Rept. 1768, p. 44.

*Gekko verticillatus*, Boulenger, Cat. Liz. I 1885, p. 183 (s. syn.).

*Gekko gekko*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 82.

Head large; its width equals twice the distance from the end of the snout to the orbit, and from the orbit to the ear-opening; snout triangular, obtuse, one time and three fifths or one

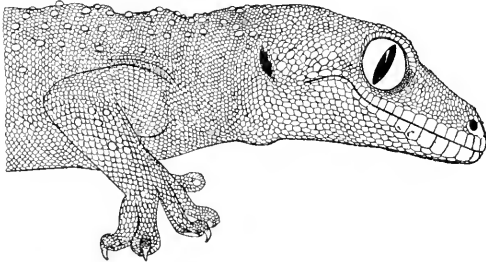


Fig. 34. *Gecko verticillatus* Laur. nat. size.

time and two thirds the diameter of the orbit; forehead concave; ear-opening narrow, oblique, its vertical diameter at least half the diameter of the orbit. Head covered with small, convex polygonal scales. Rostral large, twice as broad as high; nostril bordered by five or six enlarged nasals (fig. 33 a). Twelve to fifteen upper and ten to thirteen lower labials; mental variably-shaped; four or five pair of chin-shields, smaller than the labials, the inner pair generally not longer than the mental, forming a suture. Back with small flat granules and about twelve longitudinal series of tubercles; throat with flat granules. Ventral scales large, imbricate. Male with 13—24 praeanal pores in a short angular series. Tail slightly depressed, tapering, annulate, covered with quadrangular smooth scales, larger beneath; each annulus is composed of 5—6 rows of scales above, 3 beneath; above large conical tubercles in 6 longitu-

dinal series. Limbs moderate; digits free, dilated, inferiorly with undivided curved lamellae (fig. 35).

Grey above with red spots or vermiculations; tail with darker bands. Beneath whitish, often variegated with grey. Length of head and body 171 mm.; tail 150 mm.

Nom. indig. Tokkèh (Mal.).

Habitat: Sumatra! (Pulu Weh!, Atjeh, Padang, Talang Akar, Palembang); Banka!; Biliton; Java (Anjer, Gadok, Krawang, Batavia!, Weltevreden!, Buitenzorg!, Depok, Preanger!, Ngawi, Surakarta!, Semarang, Surabaya!); Madura; Borneo! (Rejang, Singkawang); Celebes (Manado, Kema, Rurukan, Ponre, Macassar!); Lombok; Sumba; Flores!; Djampea!; Adonara; Savu; Rotti; Timor!; Samao!; Ombaai; Damma!; Timor Laut; Aru Islands. — Malacca; Andamans; Burma; Tenasserim; Calcutta; Siam; China; Philippines; Port Essington; Madagascar.

House-gecko.

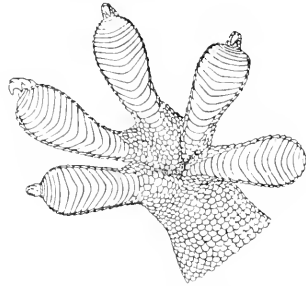


Fig. 35. *Gecko verticillatus*  
Laur. Fore limb  $\times 2$ .

## 6. *Gecko stentor* (Cantor).

*Platydactylus stentor*, Cantor, J. Asiat. Soc. Bengal XVI 1847, p. 624.

*Gecko stentor*, Boulenger, Cat. Liz. I 1885, p. 184 (s. syn.).

Head large; its width less than twice the distance from the end of the snout to the orbit; snout longer than in *G. verticillatus*, one time and two thirds or one time and three fourths the diameter of the orbit and considerably more than the distance from the orbit to the ear-opening; forehead concave; ear-opening oval, oblique, its diameter less than half the diameter of the orbit. Head covered with small, polygonal scales, largest on the snout. Rostral very large, twice as broad as high; nostril bordered by the first labial and 5 enlarged nasals (fig. 33*b*). Twelve to fourteen upper and ten to twelve lower labials; mental large, pentagonal; three to five chin-shields on each side, smaller than the labials, the inner pair often longer than the mental. Body long, covered with flat granules and ten or twelve longitudinal series of conical tubercles; throat with small granules. Ventral scales large, imbricate.

Male with 11—16 praeanal pores in a short angular series. Tail cylindrical, annulate, covered with quadrangular smooth scales, larger beneath; each annulus is composed of 8—11 rows of scales above, 3 beneath; above large conical tubercles in 6 longitudinal series; below the large scales are transversely dilated, forming two symmetrical series. Limbs long; digits free, strongly dilated, below with undivided curved lamellae.

Brown or brownish-grey above, variegated with darker tints, usually with transverse rows of white spots; sometimes a  $\Lambda$ -shaped dark brown mark on the head; tail banded with darker and lighter. Lower parts whitish, variegated with grey. Length of head and body 190 mm.; tail 180 mm.

Nom. indig. Bewak pongo (mal.).

Habitat: Nias!; Sumatra (Deli!, Indragiri, Langkat!, Bingin Telok, Tandjung Laut, Palembang, Padang, Taluk!); Borneo (Bandjermassin, Labuan, Kapuas river, Kuching, Rejang river, Undup, Akar river, Sandakan, Mt. Dulit); Java (Buitenzorg, Depok, Bantam). — Malacca; Burma; Andamans; Nicobars.

#### 10. *Ptychozoon* Kuhl.

(VIII., in Fitzinger, N. Class. Rept. p. 13, 1826).

Digits strongly dilated, entirely webbed, with undivided lamellae below (fig. 37); all except the inner ones with a compressed curved distal phalanx with retractile claw, beginning a little before the extremity of the dilatation. Limbs and sides of head, body and tail with much developed cutaneous expansions, used for concealing purposes. Body covered above with juxtaposed granular scales and tubercles; lower surfaces with small, slightly imbricate scales. The membrane covered above with imbricate square scales, below without scales. Pupil vertical. Males with praeanal and femoral pores.

Distribution. Western part of the Archipelago.

#### Key to the Indo-Australian species.

- A. Body covered with granular scales and longitudinal rows of widely distributed tubercles. End of tail with a broad flap. Male with praeanal pores only . . . . . 1. *P. homalocephalum* p. 59.
- B. Body covered with granular scales only, no tubercles. Tail bordered from base to tip by rounded lobes. Male with praeanal and femoral pores . . . . . 2. *P. horsfieldi* p. 61.

1. *Ptychozoon homalocephalum* (Crev.).

*Lacerta homalocephala*, Creveldt, Mag. Naturf. Fr. Berlin III 1809, p. 267 pl. VIII.

*Ptychozoon homalocephalum*, Boulenger, Cat. Liz. I 1885, p. 190 (s. syn.).

*Ptychozoon Kuhli*, Stejneger, P. Biol. Soc. Washington XV 1902, p. 37.

*Ptychozoon Kuhli*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 82.

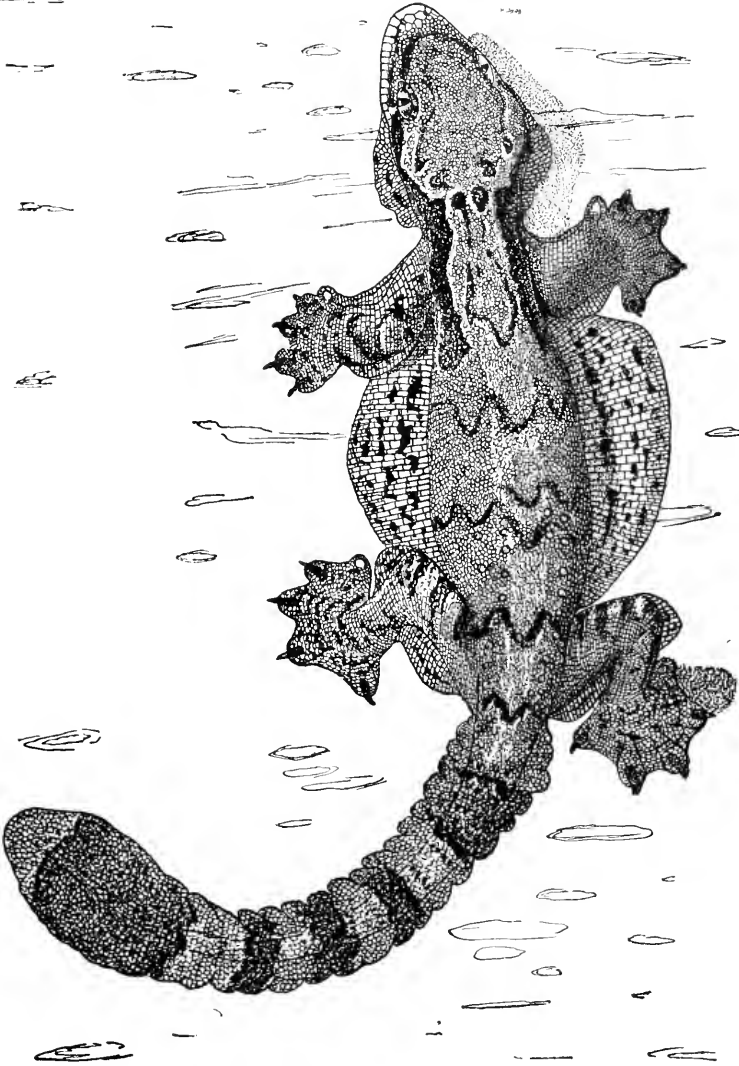


Fig. 36. *Ptychozoon homalocephalum* (Crev.).

Head oviform; snout longer than the distance from the eye

to the ear-opening, one time and a half the diameter of the orbit; forehead concave; ear-opening large, roundish. A small lobe on the side of the head, below the ear-opening, from the angle of the mouth to the neck, covered with large scales. Head covered with small granular scales; rostral very large, quadrangular; two pair of supranasals, the one next to the rostral larger; nostril bordered by the rostral, the first labial, two supranasals and two small scales. Ten to fifteen upper and ten to twelve lower labials; mental small, triangular; three or four small chin-shields on each side, inner long, forming a long suture with its fellow. Body much depressed, covered with small granular scales and enlarged tubercles. Throat covered with small scales, belly with larger ones. Male with 18—28 praeanal pores in a curved line. Tail annulate, long, strongly depressed, the sides bordered by a series of rounded dermal lobes,

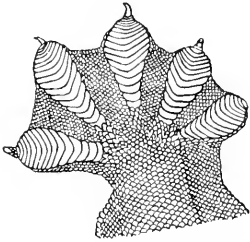


Fig. 37. *Ptychozoon homaloccephalum* (Crev.). Fore limb  $\times 2$ .

ending in a broad rounded flap; covered above with small granular scales and transverse series of pointed tubercles, below with imbricate scales. Limbs strong, depressed; digits strong, webbed to the tips of the dilated parts (fig. 37); the fore limbs bordered on each side, the hind limbs on the posterior side of the femur and on both of the tibia by a broad dermal expansion.

Greyish or reddish-brown above with transverse undulated dark brown bands; a dark brown streak from the eye to the first dorsal band. Lower parts yellowish. Length of head and body 98 mm.; tail 92 mm.

Habitat: Simalur!; Nias!; Mentawai Islands (Saibi!); Engano; Sumatra (Deli!, Langkat, Battak Highlands, 800—1000 M., Indragiri, Agam, Alahan Pandjang); Java (Gadok, Buitenzorg!, Preanger, Sukabumi!, Gunung Ungaran!, Willis Mts., 5000 feet, Tengger Mts., 1200 M.); Borneo (Barang, Pamabo range, Mt. Dulit, Pankalan ampat, Kuching, Balingeau, Sarawak). — Malacca; Burma; Nicobars; Andamans?.

Young specimens have the same coloration, tail with dark brown cross bands. The female deposits two eggs at a time which are 14 mm. in diameter. They are greyish-white, semi-globular and attached to the bark of a tree (*Urostigma rumphii*) with a flat basis. Two eggs are always found together (fig. 2. 1),



in contact with flat surfaces. The adhesive face of the egg is soft, the other part is hard.

Specimens without dorsal tubercles have been named *Ptychozoon homalocephalum* var. *lionotum* by Annandale.

## 2. *Ptychozoon horsfieldi* (Gray).

*Pteroptera horsfieldii*, Gray, Phil. Mag. (3) II 1827, p. 56.

*Ptychozoon homalocephalum*, part., Boulenger, Cat. Liz. I 1885, p. 190.

*Ptychozoon horsfieldii*, F. Müller, Verh. Ges. Basel X 1892, p. 209 pl. IV.

*Ptychozoon horsfieldii*, Flower, Proc. Zool. Soc. London 1896, p. 868.

*Ptychozoon horsfieldii*, v. Lidth de Jeude, Notes Leiden Mus. XXV 1905, p. 189.

Head oviform, snout longer than the distance from the eye to the ear-opening; forehead concave; ear-opening triangular. Head with small equal granules. Rostral large, quadrangular; nostril bordered by the rostral, the first labial and three nasals; the upper pair of nasals separated by a larger scale; above the labials two other large scales on each side. Eleven upper and as many lower labials; mental small, triangular; four chin-shields on each side, inner forming a long suture with its fellow. Body depressed, with small granules above, no tubercles; a broad membrane on the sides. Throat granular; ventral scales larger, cycloid, imbricate. Male with 7—12 praeanal pores in an angular series, separated by 8 scales from 9—14 femoral pores on each side. Tail depressed, annulate, the sides bordered by a series of dermal lobes, the tip not ending in a broad flap; the lobes directed somewhat obliquely; upper caudal scales granular, lower transversely enlarged. Limbs depressed; digits strong, entirely webbed; the fore limbs bordered by a broad dermal expansion, the hind limbs on the posterior side of the femur and on both of the tibia.

Brown above with broad, lighter cross bands, edged with a dark wavy line; a broad dark streak from the eye to the shoulder, sometimes broken up into round spots. Tail with dark and light bands. Lower parts yellowish, uniform or spotted with brown. Length of head and body 80 mm.; tail 75 mm.

Habitat: Borneo (Nanga Raun!, Sarawak!, Mt. Dulit!). — Penang (1900 feet); Singapore; Burma; Loo-Choo Islands.

## 2. Fam. PYGOPODIDAE.

Body vermiform, covered with roundish imbricate scales. Head long and pointed, with more or less regular plates above, except in *Lialis*, the only Indo-Australian genus; this form has its head covered with small scales. Tongue thick, papillose, feebly bifid anteriorly, extensible (fig. 1. 2). Pleurodont, numerous small, closely set teeth. Eye small, with vertical pupil, no movable eyelids. The ear is exposed (*Lialis*) or covered by scales. No fore limbs, rudiments of hind limbs. Praeanal pores absent or present in both sexes. Tail long and fragile.

Only one genus inhabits the Indo-Australian region.

1. *Lialis* Gray.

(GRAY, Proc. Zool. Soc. p. 134, 1834).

Parietal bones fused. Teeth sharply pointed, directed backwards. Tongue elongate, narrowing towards the end, bifid. Ear exposed. Head covered with small plates. Frequently slight rudiments of external hind limbs are visible. Scales soft, smooth, cycloid, imbricate, two median ventral and subcaudal series transversely enlarged, hexagonal. Praeanal pores present.

Distribution. New Guinea; Australia.

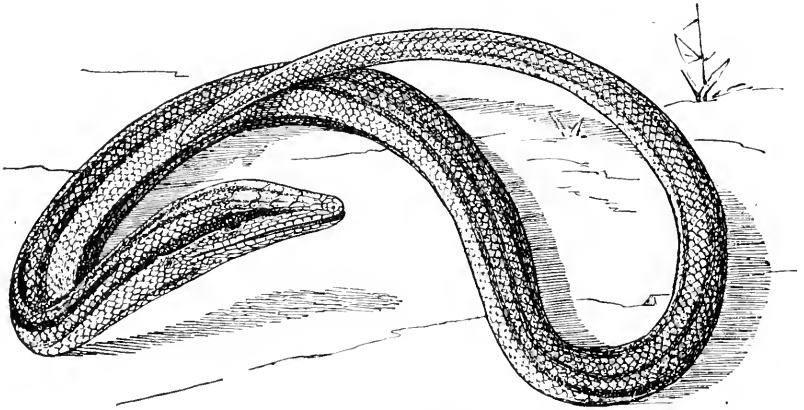


Fig. 38. *Lialis burtoni* Gray.

## Key to the Indo-Australian species.

- A. Snout truncate at tip; 13—17 upper, 12—16 lower labials; 4 praeanal pores; 19—21 rows of scales . . . 1. *L. burtoni* p. 63.  
 B. Snout not truncate at tip; 17—22 upper, 18—22 lower labials; 6—8 praeanal pores; 22 rows of scales . . . 2. *L. jicari* p. 64.

1. *Lialis burtoni* Gray.

*Lialis burtonii*, Gray, Proc. Zool. Soc. 1834, p. 134.

*Lialis burtonii*, Boulenger, Cat. Liz. I 1885, p. 247 (s. syn.).

Snout long, depressed, pointed, with angular canthus rostralis, four or five times as long as the eye, which is small and surrounded by a circular, scaly, rudimentary lid, its diameter is contained thrice in the distance between the nostril and the orbit; ear-opening elliptical or roundish, oblique.

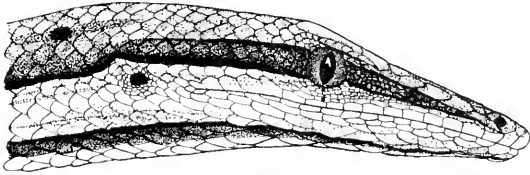


Fig. 39. *Lialis burtoni* Gray  $\times 4$ .

Snout covered with small plates, varying in number. Rostral low, more than twice as broad as high, on the lower surface of the snout; nostril in the posterior part of a nasal; three supraoculars, median large; 13—17 small upper labials, separated from the orbit by 2 or 3 rows of scales, 12—16 lower labials; mental rather large, pentagonal; on each side of the throat a series of enlarged scales, separated from the labials by one or two rows of scales. Nineteen to twenty-one scales round the middle of the body; the enlarged ventrals in 70—100 pairs. Four praeanal pores, sometimes indistinct in females; 3 or 5 anal scales (fig. 40). Small rudiments of external hind limbs. Tail about as long as head and body, tapering to a fine point, covered below with transversely enlarged scales.

Brown, grey, reddish or yellowish above, variously marked or uniform. Length of head and body 247 mm.; tail 270 mm.

Habitat: Aru Islands; New Guinea (Merauke!, Astrolabe Bay!, Friedrich-Wilhelmshafen, Paup, Borepata, Kapa Kapa, Port Moresby, Haveri, Hula, Inawi, Dinawa, St. Joseph's river District, Katow); Yule Island; Valise Island. — Australia.

This species varies exceedingly in colour. Boulenger has

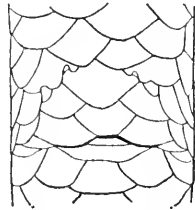


Fig. 40. *Lialis burtoni* Gray. Four praeanal pores; three anal scales.  $\times 5$ .

united all the several forms, formerly described, into one species, divided into a great many varieties of coloration; his list of varieties may find a place here.

A. A white labial band, extending along the side of the body.

1. The band very narrow and bordering the lower lip only.

Var. A. The sides of the head between the labial white line and a more or less distinct narrow line from the tip of the snout along the canthus rostralis and above the eye to the nape, dark brown; the belly darker towards the narrow lateral white band, which is edged inferiorly by a fine brown line; the rest of the body uniform, with minute dark dots. 21 series of scales.

Var. B. As in the preceding, but the white lateral line edged above with a darker band of the same tint as the belly, which band is again edged with a rather indistinct lighter band; belly scarcely darker than the back, with white dots or shafts. 21 series of scales.

2. The white labial band is broad and occupies both the upper and the lower lip, entering the eye.

Var. C. In all other respects like Var. A. 21 series of scales.

Var. D. Light grey, the lateral band passing through the eye and the lower surface of the head dark brown; the white lateral band soon splits up into several bands, separated by darker ones; belly with darker longitudinal bands and whitish dots. 21 series of scales.

Var. E. Five or seven regular longitudinal dark bands on the body, the ventral one dividing into two on the nape, uniting again on the tip of the snout. 19 or 21 series of scales.

B. No white labial band.

Var. F. Pale grey, abdomen a little darker; throat dark brown, whitish-spotted on the sides; lips with small dark vertical bars; back with several rather indistinct darker longitudinal bands; belly white-spotted. 21 series of scales.

Var. G. Like Var. E., but with spotted lips as in var. F. 19 series of scales.

Var. H. No longitudinal bands, but generally a series of small distant black spots along each side of the back; lips spotted as in F. and G.; belly white-spotted. 19 or 21 series of scales.

Var. I. Uniformly light-coloured, with a few small dark dots above and below. 19 or 21 series of scales.

## 2. *Lialis jicari* Boulenger.

*Lialis jicari*, Boulenger, Ann. Nat. Hist. (7) XII 1903, p. 430.

*Alopecosaurus cuneirostris*, Lindholm, Jahrb. Nassau. Ver. 58 1905, p. 240.

Snout acutely pointed, not truncate at tip, twice as long

as broad, four or five times as long as the eye, which is small and surrounded by a rudimentary circular lid, its diameter is contained four to four and a half times in the distance between the nostril and the orbit; ear-opening small, oval, oblique. Snout covered with 10—13 small irregular plates, back of head with small scales. Rostral pentagonal, a little more broad than long, on the lower surface of the snout; nasal small; two or three large supra-oculars; 17—22 upper labials, 3 rows of small scales between them and the orbit; 18—22 lower labials; mental more long than broad; on each side of the throat a series of larger scales, separated from the labials by two or three rows of small scales. Twenty-two scales round the middle of the body; the enlarged ventrals in 90—105 pair. Six to eight praeanal pores, in an angular series; 5 or 6 anal scales (fig. 41). Small rudiments of external hind limbs. Tail long, one time and a half as long as head and body, or longer still, tapering to a fine point, covered below with transversely enlarged scales.

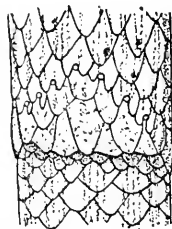


Fig. 41. *Lialis jicari*  
Blgr. Seven praeanal  
pores; six anal scales  
 $\times 4$ .

Pale yellowish or pinkish brown above, speckled with a blackish colour; a faint dark vertebral streak; a well-defined dark brown dorso-lateral streak, expanding anteriorly into a broad band occupying the side of the head; a light streak along the lower lip, widening on the body, where it forms a band, which is ill-defined above and sharply defined by a dark line below. Belly dark grey-brown, or yellowish with dark longitudinal streaks, of which one along the middle is the most distinct. Length of head and body 307 mm.; tail about 500 mm.

Habitat: New Guinea (Tanah-Merah Bay!, lake Sentani!, Fly river, Bogadjim on Astrolabe Bay).

Méhely describes a specimen of *Lialis burtoni* Gray, collected at Erima, Astrolabe Bay<sup>1)</sup>, which has 22 scales round the body, two supra-oculars and 6 praeanal pores. Its tail is one time and a half as long as head and body; length of head and body is 270 mm.; tail 423 mm. This specimen probably belongs to the species *Lialis jicari*, as described by Boulenger. In different Museum-collections more examples of the latter

1) Termes. Fuzetek XXI 1898, p. 167.

species, named now *L. burtoni* Gray will be found on closer examination, as already various authors have given indications of specimens with 22 rows of scales.

### 3. Fam. AGAMIDAE.

Body usually compressed, covered with imbricate or granular scales; crests are often present. Head covered with small scales. Tongue short, thick, slightly incised in front, villose (fig. 1. 3); acrodont, teeth usually unequal in size, so that they may be divided into incisors, canines and molars. Eye small, with round pupil and well-developed eyelids. Ear distinct or hidden. Limbs well-developed; digits often keeled or denticulated. Femoral pores usually absent. Tail very long and not fragile, prehensile in the genus *Cophotis*. They are arboreal or terres-

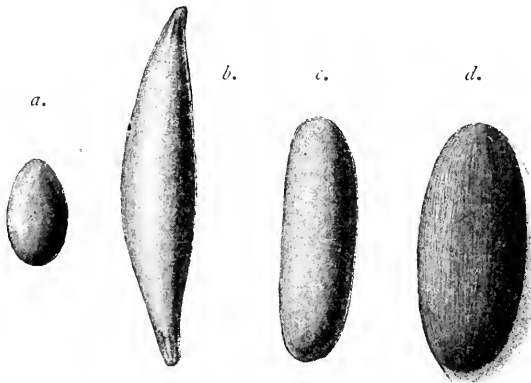


Fig. 42. Eggs of Agamidae.

*a. Draco volans* L.,  $\times 1\frac{1}{8}$ ; *b. Calotes jubatus* (D. B.) nat. size;  
*c. Calotes cristatellus* (Kuhl) nat. size; *d. Japalura ornata* Lidth  $\times 2\frac{1}{4}$ .

trial, the Indo-Australian genera being most of them arboreal; some forms can rapidly change colour as chameleons do; mostly oviparous. The eggs have a parchment-like shell and are oval or spindle-shaped (fig. 42).

## Key to the Indo-Australian genera.

## A. No femoral pores.

I. A wing-like dermal expansion . . . . . 1. *Draco*, p. 68.

## II. No wing-like dermal expansion.

## a. Tympanum hidden.

## 1. A dorsal crest.

† No fold across the throat, neither in front of the shoulder; scales small . . . . . 2. *Aphaniotis*, p. 88.†† Scales very large, irregular; tail prehensile . . . . . 3. *Cophotis*, p. 90.††† An oblique fold in front of the shoulder. . . . . 4. *Japalwa*, p. 92.

## 2. No dorsal crest.

Scales small, intermixed with large conical tubercles. . . . . 5. *Phoxophrys*, p. 94.

## b. Tympanum distinct.

1. Snout ending in a long compressed appendage . . . . . 6. *Harpesaurus*, p. 96.

## 2. Snout without appendage.

† A strong fold across the throat.

\* Males with a gular sac; digits keeled inferiorly . . . . . 7. *Gonycephalus*, p. 99.\*\* Males without gular sac; digits not keeled inferiorly . . . . . 8. *Lophocalotes*, p. 116.

†† No fold across the throat.

a. Male with gular sac; dorsal scales slightly unequal . . . . . 9. *Dendragama*, p. 117.b. Male with gular sac; dorsal scales equal. . . . . 10. *Calotes*, p. 120.c. Male without gular sac; dorsal scales unequal . . . . . 11. *Acanthosaura*, p. 125.

## B. Femoral or praeanal pores present, at least in the males.

I. Neck with a large dermal collar. . . . . 12. *Chlamydosaurus*, p. 126.

## II. No large dermal collar.

## 1. Body compressed.

a. A dorsal crest; throat with longitudinal folds; tail strongly compressed, crested; femoral pores present; toes lobate. . . . . 13. *Lophura*, p. 128.b. A dorsal crest; tail round or slightly compressed; femoral pores present; toes denticulated. . . . . 14. *Physignathus*, p. 131.

## 2. Body depressed.

a. No dorsal crest; tail round; one or two praeanal pores, no femoral pores . . . . . 15. *Diporophora*, p. 134.b. No dorsal crest; tail round; femoral pores present; skin of the sides expansible. . . . . 16. *Liolepis*, p. 135.

I. *Draco* L.

(LINNÉ, Syst. Nat. I p. 358, 1766).

Body depressed, with a lateral membrane, supported by the prolonged last five or six ribs and used for gliding through the air; when at rest, the wing-like membrane folded against the body. Dorsal scales irregular, smooth or keeled, with or without enlarged ones. Tympanum distinct or covered with scales. A gular appendage and on each side a smaller one. No femoral or praeanal pores. Tail long.

Distribution. India; Indo-Australian Archipelago.

## Key to the Indo-Australian species.

- A. Nostril lateral, directed outwards.
- I. The hind limb reaches to slightly beyond the elbow of the fore limb, or not so far.
    - a. No spines on the supraciliary border.
      1. Membrane black-spotted below. . . . . 1. *D. volans*, p. 70.
      2. Membrane unspotted below. . . . . 2. *D. reticulatus*, p. 72.
    - b. A spine on the posterior part of the supraciliary border.
      1. Dorsal scales small, subequal; eight or nine (11) upper labials; gular sac as long as the head . . . . . 3. *D. cornutus*, p. 72.
      2. A row of spine-like scales along each side at the base of the membrane; thirteen upper labials; gular sac longer than the head. . . . . 4. *D. gracilis*, p. 73.
  - II. The hind limb reaches at least to halfway between the elbow and the axilla.
    - a. Largest dorsal scales twice as large as ventrals.
      1. A series of enlarged, keeled scales along each side of the vertebral line, separated by a row of small, smooth scales; tympanum naked, as large as the eye-opening. . . . . 5. *D. timorensis*, p. 74.
      2. Dorsal scales subequal, feebly keeled; tympanum, if distinct, much smaller than the eye-opening. . . . . 6. *D. walkeri*, p. 75.
    - b. Dorsal scales a little larger than, or as large as the ventrals.



- † A lateral series of enlarged, distant scales; tail with a strong crest . . . 7. *D. punctatus*, p. 75.
- †† No enlarged lateral scales.
- I. Tympanum usually scaly; membranes dark brown above, with light longitudinal lines, sometimes also light transverse bands . . . 8. *D. lineatus*, p. 76.
- II. Tympanum usually naked.
1. Membranes orange, brown or yellow above, with a black outer border and black spots near the outer margin . . . . . 9. *D. beccarii*, p. 77.
2. Membranes yellowish above, with small black spots on the basal part . . . . . 10. *D. spilnotus*, p. 77.
3. Membranes reddish-brown, black along the margin, with indistinct lighter spots. . . . 11. *D. modiglianii*, p. 78.
- c. Dorsal scales smaller than ventrals.
1. Tympanum scaly; no caudal crest; no enlarged lateral scales . . . . 12. *D. ochropterus*, p. 79.
2. Tympanum naked; a caudal crest; a lateral series of enlarged scales on the posterior part of the body 13. *D. fimbriatus*, p. 79.
3. Tympanum partly naked; a caudal crest; no lateral series of enlarged scales. . . . . 14. *D. cristatellus*, p. 80.
- B. Nostril vertical, directed upwards.
- I. Tympanum scaly.
- a. The hind limb reaches the axilla; four widely separated enlarged scales on each side of the back; gular sac one time and a half the length of the head 15. *D. maximus*, p. 81.
- b. The hind limb reaches slightly beyond the elbow; lateral series of enlarged scales very indistinct; gular sac not quite twice the length of the head . . 16. *D. quinquefasciatus*, p. 81.
- c. The hind limb reaches slightly beyond the shoulder; four groups of enlarged scales on each side of the body; gular sac shorter than the head . . . . . 17. *D. cryptotis*, p. 82.
- II. Tympanum naked.
- a. The hind limb does not reach beyond the axilla.

1. Snout slightly longer than the diameter of the orbit; gular sac as long as the head; membranes olive above, edged with reddish, with five black transverse bands, sometimes indistinct . . . . . 18. *D. formosus*, p. 83.
  2. Snout as long as the diameter of the orbit; gular sac one and one third time the length of the head (scarcely indicated in the female); membranes red above with black spots . . . . . 19. *D. haematopogon*, p. 84.
  3. Snout shorter than the diameter of the orbit; gular sac one time and a half or one time and three fourths the length of the head; membranes deep black above, with small yellow spots . . . . . 20. *D. melanopogon*, p. 84.
6. The hind limb reaches beyond the axilla.
- \* Male with a slight nuchal fold . . . . . 21. *D. taeniopterus*, p. 85.
  - \*\* Male without nuchal fold.
    1. A lateral series of widely-distant, enlarged, keeled scales; membranes black above . . . . . 22. *D. obscurus*, p. 85.
    2. A few widely separated, enlarged, keeled scales; membranes grey-brown above, with five indistinct black cross bands . . . . . 23. *D. microlepis*, p. 86.
    3. A single enlarged, keeled scale on each side, nearer to the hind limbs; membranes with whitish longitudinal lines and indistinct dark transverse bands . . . . . 24. *D. intermedius*, p. 86.

### 1. *Draco volans* L.

*Draco volans*, Linn. Syst. Nat. I 1766, p. 358.

*Draco volans*, Boulenger, Cat. Liz. I 1885, p. 256 (s. syn.).

Head small; snout not or a little longer than the diameter of the orbit; nostril lateral, directed outwards; tympanum naked <sup>1)</sup>, smaller than the eye-opening. Head-scales very unequal, keeled; a  $\Lambda$ -shaped series of larger scales on the snout; at the posterior corner of the orbit a small tubercle and on each side of the neck a few tubercles; seven to ten upper labials. Gular sac longer than the head. Male with a low

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1) The character of the tympanum being naked or scaly is among the genus *Draco* often very doubtful.

nuchal crest. Dorsal scales irregular, keeled, the largest at least twice as large as the ventrals; a lateral series of large, keeled, widely separated scales. Tail one time and a half the length of head and body, without a crest. The fore limb extends beyond the tip of the snout, the hind limb reaches the elbow of the fore limb or not so far.

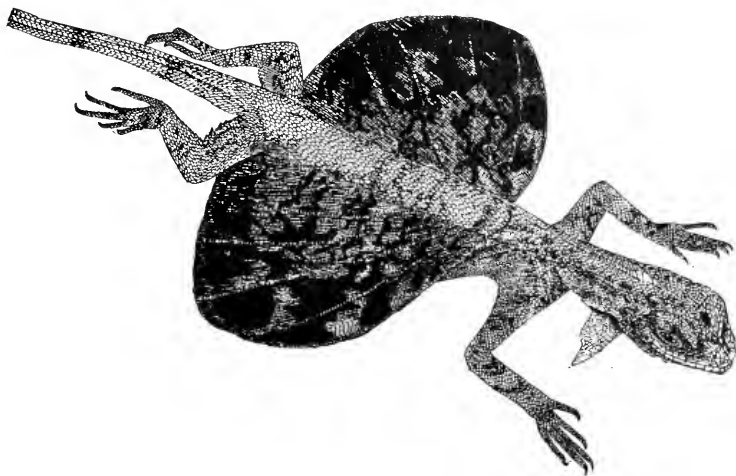


Fig. 43. *Draco volans* L. ♂ About one third of the tail figured.

Light brown above, with metallic gloss and spots and undulated transverse bands of reddish-brown or blackish-brown; a black spot on the head between the orbits and one on the nape; membranes in the males orange above and blue below, in the females yellow above and greenish-yellow below, marbled with black or with irregular transverse bands. Lower parts greenish-yellow; throat variegated with black; gular sac yellow or orange in the male, green or bluish in the female, also variegated with black. Length of head and body 85 mm.; tail 135 mm.

Nom. indig. Tjitjak terbang (mal.); Tjekiber; Bidadari; Apam apam (Simalur).

Habitat: Simalur!; Pulu Babi!; Nias!; Mentawai Islands (Sipora); Sumatra (Upper Langkat, Battak Highlands 800—1000 M., Taluk!, Kaju tanam!, Muara Labu!, Padang 1500—3000 feet, Medan-Deli!, Indragiri, Tandjung Laut, Palembang!); Natuna Islands (Pulu Laut); Banka; Biliton; Java

(Mt. Salak, Depok, Krawang, Batavia!, Weltevreden!, Buitenzorg!, Preanger!, Tjilatjap!, Samarang!, Ambarawa, Wonosobo, Willis Mts. 5000 feet, Sumber Duren near Malang!, Nongkodjar in Tengger Mts. 1300 M.!, Surabaya); Bali; Lombok; Flores!; Timor!; Borneo (Kuching, Poeh, Sarawak, Penrissen Hills, Baram, Labuan, Sanggau on Kapuas river!, Bandjermassin, Pontianak, Singkawang, Sintang); Celebes (Manado, Macassar). — Malacca; Penang; Singapore; Siam; Palawan.

The eggs, two or three, sometimes four, contained in the female, are yellow, and measure about 7 by 12.5 mm. (fig. 42 a).

## 2. *Draco reticulatus* Günther.

*Draco reticulatus*, Günther, Rept. Brit. Ind. 1864, p. 125.

*Draco reticulatus*, Boulenger, Cat. Liz. I 1885, p. 257.

Head small; snout as long as the diameter of the orbit; nostril lateral, turned outwards and upwards; tympanum naked, smaller than the eye-opening. Head-scales very unequal, keeled; a  $\Lambda$ -shaped series of large scales on the snout; a compressed scale at the posterior border of the orbit and a few tubercles on each side of the neck; eight upper labials, last twice as large as the preceding one. Gular sac as long as the head. Male with a distinct nuchal crest. Dorsal scales irregular, faintly keeled, the largest at least twice as large as the ventrals; a lateral series of large, keeled scales. Tail one time and two thirds the length of head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches a little beyond the elbow.

Pale brown above, with metallic gloss and dark reticulation or irregular transverse bands; membranes pale brown with dark brown markings and round whitish spots, below unspotted. Lower parts olive or yellowish; throat and lateral wattles with purplish reticulation. Length of head and body 85 mm.; tail 140 mm.

Habitat: Lombok; Flores!; Sumba; Celebes (Luhu 3300 feet); Sanghir Islands. — Philippines.

## 3. *Draco cornutus* Günther.

*Draco cornutus*, Günther, Rept. Brit. Ind. 1864, p. 125.

*Draco cornutus*, Boulenger, Cat. Liz. I 1885, p. 258.

Head small; snout as long as the diameter of the orbit;

nostril lateral, directed outwards; tympanum naked, smaller than the eye-opening. Head-scales very unequal, keeled; a  $\Lambda$ -shaped series of enlarged scales on the snout; a large compressed, pointed scale posteriorly on the supraciliary region; eight or nine (11) upper labials, the last much larger than the others. Gular sac as long as the head. A very low nuchal crest in both sexes. Dorsal scales small, keeled, not much larger than the ventrals, with a lateral series of enlarged separated scales. Tail nearly one time and a half as long as head and body. The fore limb extends to the tip of the snout or a little beyond, the hind limb reaches between the wrist and the elbow.

Olive, variegated with reddish-brown above, with black spots: one between the orbits, one on the nape and another on each side before the shoulders; membranes brick-red, edged with black and marbled with black above, below with black spots or transverse bands. Lower parts lighter, with a blue streak on each side of the belly; limbs blue below; throat variegated with bluish-green; gular sac of male red. Length of head and body 92 mm.; tail 130 mm.

Nom. indig. Tarang burong; Pindau (Sarawak).

Habitat: Sumatra (Tandjung Laut in Palembang); Borneo (Labuan, Sandakan Bay!, Kion, Kina Balu, Pamabo Range, Mt. Dulit, Balingeau, Matang 800 feet, Sarawak!, Baram river, Mt. Mulu, Santubong, Kuching, Long Bloe on Mahakkam river!, Buntok on Barito river, Tandjong). — Sulu Archipelago (Jolo).

Three or four eggs, taken out of a female specimen, measured 13 by 7.5 mm.

#### 4. *Draco gracilis* Barbour.

*Draco gracilis*, Barbour, Proc. Biol. Soc. Washington XVI 1903, p. 59.

Head moderate; snout as long as the diameter of the orbit; nostril lateral, directed outwards; tympanum naked, smaller than the eye-opening, with scales encroaching somewhat from the margins; a prominent tubercle on the posterior part of the supraciliary region. Head-scales keeled; those on temple and nuchals slightly keeled or smooth; thirteen upper labials, last largest. Gular sac longer than the head. Male with a small nuchal crest, formed of a single row of triangular scales. Body slender; dorsal scales keeled, with a row of triangular spine-

like scales along each side at the base of the wing-membrane; ventral scales keeled. Tail one time and a half the length of head and body. The hind limb reaches halfway between the wrist and the elbow; along the inner side of the tibia and femur a yellowish serration, formed by a series of enlarged, flat, triangular scales.

Light greyish-brown above, with metallic spots, which are more numerous at the base of the membranes, where each spot covers a single scale, and along the ribs; forehead dark brown; membranes dark orange above, with irregular black bands, below whitish, barred with brown or black. Lower parts light grey; neck and throat speckled with dark brown; at the base of the gular sac a number of blackish spots. Length of head and body 68 mm.; tail 109 mm. (After Barbour, not seen by me).

Habitat: Borneo (Sarawak).

##### 5. *Draco timorensis* Kuhl.

*Draco timorensis*, Kuhl, Beitr. Zool. u. Vergl. Anat. 1820, p. 103.

*Draco timorensis*, Boulenger, Cat. Liz. I 1885, p. 261 (s. syn.).

Head moderate; snout longer than the diameter of the orbit; nostril lateral, directed outwards; tympanum naked, as large as the eye-opening. Head-scales very unequal, large, keeled; a larger median series on the snout, other large scales on the supraocular region and on each side of the neck; a small tubercle at the posterior corner of the orbit; nine upper labials (8 or 10), last twice as large as the preceding one. Gular sac shorter than the head. A distinct nuchal crest. Dorsal scales smooth, larger than the ventrals; on each side of the vertebral line a series of large, keeled scales, the keels forming continuous lines and separated from each other by one or two rows of small smooth scales; a lateral series of large, keeled, widely separated scales. Tail one time and two thirds the length of head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches the elbow or halfway between the elbow and the axilla.

Greyish-brown above, with metallic gloss and irregular dark spots; membranes brown above, darkest along the margin, with lighter longitudinal lines, below brownish or with a few black spots. Lower parts olive or grey; throat and sides of

neck dotted with brown. Length of head and body 90 mm.; tail 150 mm.

Habitat: Ombai (or Alor); Wetar!; Flores!; Timor!; Samoa!; Rotti!.

Five eggs, taken from a female specimen, measured 12 by 7.5 mm.

#### 6. *Draco walkeri* Boulenger.

*Draco Walkeri*, Boulenger, Ann. Nat. Hist. (6) VII 1891, p. 279.

Head small; snout not quite so long as the diameter of the orbit; nostril lateral, directed outwards; tympanum, if distinct, much smaller than the eye-opening. Head-scales unequal, strongly keeled; six to eight upper labials. Gular sac small, about half the length of the head in the male, merely indicated in the female. Male with a very low nuchal crest. Dorsal scales subequal, much larger than ventrals, often with a short, feeble keel. Tail one time and a half the length of head and body. The fore limb reaches beyond the tip of the snout, the hind limb reaches the axil.

Grey-brown above with wavy brown cross lines and a few whitish spots on each side; a dark spot between the eyes, another on the posterior part of the supraocular region and a third on the nape; dark lines radiating from the eyes; membranes brown above, blackish anteriorly in the male, spotted with black in the female, below with a pair of large black spots in front. Lower parts unspotted. Length of head and body 72 mm.; tail 113 mm.

Type-specimen examined in the British Museum.

Habitat: Timor (Kupang!).

#### 7. *Draco punctatus* Boulenger.

*Draco punctatus*, Boulenger, Ann. Nat. Hist. (7) VI 1900, p. 189; Fasc.

Malayens. Zool. I. 1903, p. 151, pl. X fig. 1.

*Draco punctatus*, Werner, Mitt. Naturhist. Mus. Hamb. XXVII 1910, p. 19.

Head rather large; snout as long as the diameter of the orbit; nostril lateral, directed outwards; tympanum naked, almost as large as the eye-opening. Head-scales small, very unequal, keeled; a  $\Lambda$ -shaped series of enlarged scales on the snout; two conical, triangular, enlarged, erect scales on the

posterior part of the supraciliary border; ten or eleven feebly keeled upper labials. Gular sac a little shorter than the head. Male with a distinct nuchal crest. Dorsal scales unequal, feebly keeled, not larger than ventrals, with a lateral series of enlarged, distant scales. Tail with a strong crest of large, pointed, compressed scales, its length one time and two thirds the length of head and body. The fore limb extends a little beyond the tip of the snout, the hind limb reaches the axilla or between the elbow and the axilla.

Greyish above, with a reddish vertebral stripe and reddish on the head, and numerous black dots; four dark blotches sometimes form a cross between the shoulders; membranes black above, with interrupted whitish streaks, below uniformly whitish. Lower parts pale blue, throat with black dots; gular sac and inner side of the lateral lappets yellow. Length of head and body 91 mm.; tail 156 mm.

Type-specimen examined in the British Museum.

Habitat: Borneo (Sarawak!). — Malacca (2500 and 3000 feet).

#### 8. *Draco lineatus* Daud.

*Draco lineatus*, Daudin, Hist. Rept. III 1802, p. 298.

*Draco lineatus*, Boulenger, Cat. Liz. I 1885, p. 264 (s. syn.).

Head small; snout as long as or a little longer than the diameter of the orbit; nostril lateral, directed outwards; tympanum usually scaly. Head-scales very unequal, keeled, those on the median line of the snout and on the supraocular region largest; five to eight upper labials, last largest. Gular sac shorter than the head. A slight nuchal crest. Dorsal scales equal, feebly keeled, not larger than ventrals; no lateral series of enlarged scales. Tail nearly twice as long as head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla or a little farther.

Olive-brown above, with pale spots and transverse bands; a dark spot on the supraocular region and one on the nape; membranes above dark brown with white longitudinal lines, sometimes with dark and light cross bands, below dark brown with lighter bands. Lower parts greenish, throat and sides of neck with dark reticulation and light round spots; lips with dark bars. Length of head and body 82 mm.; tail 158 mm.



Nom. indig. Longkebila (Toradja-name).

Habitat: Java!; Borneo (Sandakan Bay!); Celebes (Manado, Posso!, Luhu!, Tempe!); Buru; Ambon!; Ceram!; Misol; Kei Islands.

#### 9. *Draco beccarii* Peters & Doria.

*Draco Beccarii*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 373.

*Draco beccarii*, Boulenger, Cat. Liz. I 1885, p. 264.

Head small; snout as long as the orbit; nostril lateral, directed outwards; tympanum usually naked; sometimes scaly. Head-scales unequal, keeled; two to four series of scales between the larger, strongly keeled supraoculars; one or two series of scales between the nasal and the rostral; eight to ten upper labials. Gular sac two thirds to three fourths the length of the head. A very low nuchal crest. Dorsal scales keeled, sometimes almost smooth, a little larger than ventrals, which are keeled; no lateral series of enlarged scales. Tail about twice the length of head and body. The fore limb extends far beyond the tip of the snout; the hind limb reaches the axilla or the shoulder.

Pale grey above, marbled with brown or with wavy transverse bands; a black spot on the nape present or absent. Male with the side of the head reticulated with dark grey; gular sac orange; membranes orange, brown or grey, with a blackish outer border and some black spots above and usually one or two below the anterior border. Female with black lines on the head, one through the eye, forming an angle on the occiput; throat dotted with black; membranes orange or yellow, spotted with black, and with two to four black transverse bands on the outer parts and some black spots below near the anterior border. Length of head and body 75 mm.; tail 142 mm.

Habitat: Celebes! (Kandari, Muna-Raha, Rumbi-Mengkoka, Pundidaha, Luhu, Macassar, Lamontjong!, near Bonthain!).

#### 10. *Draco spilonotus* Günther.

*Draco spilonotus*, Günther, Proc. Zool. Soc. London 1872, p. 592, pl. XXXV fig. B.

*Draco spilonotus*, Boulenger, Cat. Liz. I 1885, p. 265.

Head small; snout as long as the diameter of the orbit; nostril lateral, directed outwards; tympanum usually naked.

Head-scales very unequal, keeled; those on the median line of the snout, on the supraocular region and on the occiput largest; six or seven upper labials. Gular sac much shorter than the head. A distinct nuchal crest. Dorsal scales equal, smooth, a little larger than the ventrals; no lateral series of enlarged scales. Tail twice as long as head and body. The fore limb extends a good deal beyond the tip of the snout, the hind limb nearly reaches the axilla or beyond the latter.

Greyish or greenish above, with irregular brown markings; a black spot on the nape; black lines along the inner borders of the supraorbital region, on the snout and on the chin; sides of the neck with round light green spots; membranes pale yellow above, with black spots, forming short transverse lines on the basal part, below unspotted. Lower parts greenish, throat with lighter spots. Length of head and body 60 mm.; tail 122 mm.

**Habitat:** Celebes! (Minahassa, Toli-toli, Manado, Tomohon, Kema).

#### 11. *Draco modiglianii* Vincig.

*Draco Modiglianii*, Vinciguerra, Ann. Mus. Civ. Genova (2) XII 1892, p. 523.

Snout short, as long as the diameter of the orbit; nostril lateral, directed outwards and upwards; tympanum naked, small. Head-scales unequal, keeled, those on the occiput largest, almost smooth; a  $\Lambda$ -shaped series of enlarged, strongly keeled scales on the snout; seven or eight upper labials, last largest. Gular sac shorter than the head. A slight nuchal crest. Dorsal scales strongly keeled, not larger than ventrals; no lateral series of enlarged scales. Tail twice the length of head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla.

Olive-brown above, with reddish-brown transverse bands; chin and throat bluish, spotted with dark; membranes reddish-brown, black towards the outer margin, with indistinct light spots. Female with brown spots on head and nape and dark lines radiating from the eye. Head and neck of male bluish, reticulated with blackish. Length of head and body 62 mm.; tail 127 mm.

Type-specimen examined in the British Museum.

**Habitat:** Engano!.

12. *Draco ochropterus* Werner.

*Draco ochropterus*, Werner, Mitt. Naturh. Mus. Hamb. XXVII 1910, p. 11.

Snout shorter than the diameter of the orbit; nostril lateral, directed outwards; tympanum scaly. Head-scales unequal, a median series of enlarged ones on the snout; the anterior of the supraorbital border enlarged, separated from those of the other side by three rows of scales; five or six very large upper labials, generally first and last largest. Gular sac small, with small scales, lateral wattles indistinct. Male with a small, but distinct nuchal crest. Dorsal scales keeled, the keels forming lines, median largest, but smaller than ventrals; no enlarged lateral scales. Tail twice as large as head and body, without a crest. The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla or beyond.

Grey above, with indistinct transverse bands on limbs and tail; sometimes with transverse rows of round white spots on the back; head and sides of neck with large, white spots; membranes yellow, uniform or with indistinct dark transverse bands. Lower parts uniform; throat reticulated with grey and white; gular sac yellow. Length of head and body 75 mm.; tail 153 mm. (After Werner, not seen by me).

Habitat: Kei Islands.

13. *Draco fimbriatus* Kuhl.

*Draco fimbriatus*, Kuhl, Beitr. Zool. u. Vergl. Anat. 1820, p. 101.

*Draco fimbriatus*, Boulenger, Cat. Liz. I 1885, p. 265 (s. syn.).

*Draco grandis*, Bartlett, Crocod. Liz. Borneo 1895, p. 83.

Head large; snout a little longer than the diameter of the orbit; nostril lateral, directed outwards and upwards; tympanum naked, smaller than the eye-opening. Head-scales small and keeled, a  $\Lambda$ -shaped series of large scales on the snout; a tubercle at the posterior corner of the orbit; along each side of the neck and on the cheeks some enlarged tubercles; ten to thirteen upper labials; on the chin some larger scales are scattered between the small ones. Gular sac longer than the head. Male with a slight nuchal crest. Dorsal scales smooth or feebly keeled, smaller than ventrals; a lateral series of conical, keeled scales on the posterior part of the body. Tail one time and a half the length of head and body, with a crest.

The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla or not quite so far.

Greyish-olive above, with reddish-brown markings, forming angular transverse bands, the anterior on the supraocular region; a black interorbital spot; membranes dark brown above, with light longitudinal lines, below with or without black spots. Lower parts olive, black-spotted; throat bluish with dark variegations and lighter spots; gular sac red. Length of head and body 108 mm.; tail 165 mm.

Habitat: Sumatra! (Batak Highlands 800—1000 M., Padang! 1500—3000 feet, Deli!, Indragiri); Natuna Islands, 500 feet; Borneo (Matang, 800 feet, Pamabo range, Sarawak!, Mt. Dulit!, Akar river, Balingeau, Bandjermassin); Java! (Buitenzorg, Parang!, Tengger Mts. 1200 M.). — Malacca (not very common here and not beyond 3000 feet).

#### 14. *Draco cristatellus* Günther.

*Draco cristatellus*, Günther, Proc. Zool. Soc. London 1872, p. 592, pl. XXXV fig. A.  
*Draco cristatellus*, Boulenger, Cat. Liz. I 1885, p. 266.

Head large; snout as long as the diameter of the orbit; nostril lateral, directed outwards and upwards; tympanum partly scaly. Head-scales very small, keeled; a  $\Lambda$ -haped series of enlarged scales on the snout; a tubercle at the posterior corner of the orbit; eleven upper labials. Gular sac much longer than the head. A distinct nuchal fold. Dorsal scales smooth or faintly keeled, smaller than ventrals; no lateral series of large scales. Tail with a crest of long, separated, triangular scales, one time and a half as long as head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla.

Reddish-brown above, spotted with black; a black spot on the head between the orbits; membranes dark brown above, with irregular light longitudinal lines, below whitish with blackish spots along the margin. Gular sac yellow, the anterior edge brown. Length of head and body 78 mm.; tail 112 mm.

Type-specimen examined in the British Museum.

Habitat: Borneo (Banting, Kuching, Sarawak!, Upper Mahakkam river!).

15. *Draco maximus* Boulenger.

*Draco maximus*, Boulenger, Proc. Zool. Soc. London 1893, p. 522, pl. XLII fig. 1.

Head small; snout as long as the diameter of the orbit; nostril vertical, directed upwards; tympanum scaly. Head-scales very small, keeled; ten scales across the middle of the interorbital region, sixteen or seventeen across the supraocular region; two or three transverse series of scales between the nasal and the rostral; a  $\Lambda$ -shaped series of enlarged scales on the snout; a large, erect, pointed scale above the tympanum; fourteen to sixteen upper labials. Gular sac one time and a half the length of the head, covered with moderate scales. Male with a slight nuchal fold, no crest. Body large; dorsal scales equal, keeled, a little smaller than ventrals, with a few (4) widely separated enlarged, erect, keeled scales on each side. Tail without a crest, about one time and two thirds the length of head and body. The fore limb extends beyond the tip of the snout, the hind limb reaches the axilla.

Bluish-grey above, sometimes dotted with black and wavy transverse bands; membranes dark brown or black above, with light longitudinal streaks, below colourless. Throat of the male speckled with black, with a black transverse band behind, of the female black with round white spots; gular sac of male red. Length of head and body 145 mm.; tail 240 mm. The largest species of the genus *Draco*.

Habitat: Sumatra (Padang!); Natuna Islands (Pulu Laut, Gr. Natuna, 1000 feet); Borneo (Matang, Akar river, Balingeau, Mt. Penrissen, Mt. Dulit, 2000 feet, Kina Balu, Paitau, Samarinda!). — Malacca.

A female specimen from Padang, in the Leyden Museum, contained five eggs, measuring 18 by 11 mm.

16. *Draco quinquefasciatus* Gray.

*Draco quinquefasciatus*, Gray, Zool. Journ. III 1827, p. 219.

*Draco quinquefasciatus*, Boulenger, Cat. Liz. I 1885, p. 269.

Head small; snout longer than the diameter of the orbit; nostril vertical, directed upwards; tympanum scaly. Head-scales small, keeled, almost equal; eleven to fifteen keeled upper labials. Gular sac long, not quite twice the length of the head. Male with a slight nuchal fold. Dorsal scales smooth

or feebly keeled, equal, not larger than ventrals; a lateral series of widely separated, larger scales on the posterior part of the body. Tail twice as long as head and body, without a crest. The fore limb extends a good deal beyond the tip of the snout, the hind limb reaches the elbow or a little beyond.

Reddish-brown above, spotted with dark brown; membranes red above with light longitudinal lines along the base and with five curved black transverse bands as broad as the interspaces, below with three or four black bands, somewhat narrower; sometimes the dark bands are continued across the back. Lower parts brownish; a black band behind the gular sac; throat bluish, spotted with brown. Length of head and body 105 mm.; tail 160 mm.

Habitat: Sumatra (Deli, Indragiri); Singkep; Borneo (Labuan, Kuching, Akar river, Kidi district, Balingeau, Sarawak, Mt. Dulit, Paitau, Bloe!, Upper Mahakkam river!, Samarinda!).—Malacca; Penang; Butang Islands.

### 17. *Draco cryptotis* Despax.

*Draco cryptotis*, Despax, Bull. Mus. d'hist. Natur. No. 4 1912, p. 5.

Head more long than broad; snout short, obtuse, a little longer than the diameter of the orbit; nostril vertical, directed upwards; tympanum scaly. Head-scales small, juxtaposed, slightly keeled; a  $\Lambda$ -shaped series of larger scales on the snout; scales of the supraorbital border enlarged, compressed, the anterior largest and preceded by a few pyramidal scales of the canthus rostralis; a small tubercle at the posterior corner of the orbit, a stronger conical one on each side of the neck, with a smaller but distinct one below and behind it; fourteen upper labials. Gular sac shorter than the head, covered with small scales, larger towards the point. Dorsal scales small, smooth, equal; on each side of the body four groups of large scales, the first above the shoulders, the second near the axilla, the third at the middle of the body, the fourth much before the insertion of the hind limbs; the posterior scales the largest; ventral scales a little larger than dorsals, keeled. Tail one time and two thirds the length of head and body. The fore limb extends beyond the tip of the snout with the whole length of the fingers, the hind limb reaches the shoulder or a little farther.

Bluish-grey above, dotted with black, the dots sometimes forming bands; some dark bands on the limbs and digits; tubercles of head and body yellowish; membranes blackish above, with whitish, interrupted longitudinal lines, below yellowish, with a few small, round black spots. Lower parts yellowish-white; throat spotted with black; gular sac and lateral lappets with a large black spot, bordered with yellow. Length of head and body 100 mm.; tail 160 mm. (After Despax, not seen by me).

Habitat: Java.

### 18. *Draco formosus* Boulenger.

*Draco formosus*, Boulenger, Ann. Hist. (7) VI 1900, p. 190.

*Draco formosus*, Werner, Mitt. Naturh. Hamb. XXVII 1910, p. 12.

*Draco affinis*, Baumann, Zool. Jahrb. Syst. XXXIV 1913, p. 261.

Head small; snout slightly longer than the diameter of the orbit; nostril vertical, directed upwards; tympanum naked, smaller than the eye-opening. Head-scales unequal, keeled; a tubercle at the posterior corner of the orbit; nine to eleven keeled upper labials. Gular sac as long as the head, thin, translucent, covered with very large scales. Nuchal fold absent or very feeble. Dorsal scales equal, smooth or slightly keeled, not larger than ventrals; a lateral series of widely separated enlarged scales. Tail without a crest, with a series of enlarged, pointed scales on each side of the base, about twice the length of head and body. The fore limb extends a good deal beyond the tip of the snout, the hind limb reaches the axilla.

Brown above, with dark spots, forming sometimes bars on the nape and back; head greyish, a black spot between the orbits and one or three on the nape; membranes olive above, edged with maroon or crimson, with five, often indistinct, blackish transverse bands and light longitudinal lines, below uncoloured. Throat spotted or reticulated with dark, in males under the lateral wattles and at the base of the gular sac brownish-red or crimson, in females dark green. Length of head and body 100 mm.; tail 200 mm.

Habitat: Sumatra (Deli!, Serdang, Battak Highlands 800—1000 M.! (type of *Dr. affinis* Baumann); Borneo (Balingeau, Kidi district, Sarawak). — Malacca, 1500—3500 feet.

19. *Draco haematopogon* Gray.

*Draco haematopogon*, Gray, Griff. Anim. Kingd. IX Syn. 1831, p. 59.

*Draco haematopogon*, Boulenger, Cat. Liz. I 1885, p. 267 (s. syn.).

Head small; snout as long as the diameter of the orbit; nostril vertical, directed upwards; tympanum naked, smaller than the eye-opening. Head-scales unequal, keeled; nine to thirteen upper labials. Gular sac one and one third time the length of the head. No nuchal fold or crest. Dorsal scales equal, smooth, not larger than the ventrals; a lateral series of widely separated, enlarged, keeled scales. Tail twice the length of head and body. The fore limb extends with the whole hand beyond the tip of the snout, the hind limb reaches the axilla.

Greenish or greyish above, with metallic lustre and darker transverse bands; snout brown; membranes brick-red above with black spots, unspotted below. Lower parts greenish; throat red, dotted with brown and with a large black spot on each side of the gular sac, which is yellow in males. Length of head and body 91 mm.; tail 181 mm.

Habitat: Mentawai Islands (Sipora); Sumatra (Battak Highlands 800—1000 M., Padang! 1500—3000 feet, Deli!, Tandjung Laut in Palembang); Borneo (Sarawak, Kuching, Penrissen Hills, Bloe on Upper Mahakkam river!); Java (Parang!, Sukabumi!, Tengger Mts. 1200 M.).

20. *Draco melanopogon* Boulenger.

*Draco melanopogon*, Boulenger, Cat. Liz. III 1887, p. 492.

*Draco nigriappendiculatus*, Bartlett, Crocod. Liz. Borneo 1895, p. 82.

Head small; snout shorter than the diameter of the orbit; nostril vertical, directed upwards; tympanum naked. Head-scales very small, subequal on the snout, keeled; eleven to fifteen keeled upper labials. Gular sac one time and a half or one time and three fourths the length of the head, covered with moderate scales. No nuchal fold or crest. Dorsal scales equal, smooth or feebly keeled, a little smaller than ventrals, with a lateral series of widely separated larger, keeled scales. Tail one time and three fourths the length of head and body. The fore limb extends far beyond the tip of the snout, the hind limb reaches the axilla or not quite so far.

Brown above, marbled with dark or with irregular dark transverse bands; sides of neck, shoulders and hind limbs



shaded with lilac; membranes black above, with yellow spots, unspotted below. Lower parts with brown spots; gular sac of male black, of female grey. Length of head and body 80 mm.; tail 145 mm.

Type-specimens examined in the British Museum.

Habitat: Sumatra (Tandjung Laut, Palembang, Indragiri); Natuna Islands; Borneo (Balingeau, Sarawak!, Kuching, Baram!, Lawas in Brunei, Sandakan!). — Malacca.

A very common species in Borneo and the Malay Peninsula.

## 21. *Draco taeniopterus* Günther.

*Draco taeniopterus*, Günther, Proc. Zool. Soc. London 1861, p. 187; Rept. Brit. Ind. 1864, p. 126, pl. XIII fig. E.

*Draco taeniopterus*, Boulenger, Cat. Liz. I 1885, p. 269.

Head small, snout as long as the diameter of the orbit; nostril vertical, directed upwards; tympanum naked, smaller than the eye-opening. Head-scales unequal, strongly keeled; six to nine upper labials. Gular sac a little longer than the head, covered with very large scales. Male with a feeble nuchal fold. Dorsal scales equal, faintly keeled, not larger than ventrals; a lateral series of larger, keeled, widely separated scales. Tail nearly twice the length of head and body. The fore limb extends far beyond the tip of the snout, the hind limb reaches beyond the axilla.

Greyish or brownish above, with metallic gloss, no distinct spots; membranes with five transverse black bands above, about as broad as the interspaces between them; some of the bands forked at the base and enclosing large light spots, below uniform. Length of head and body 71 mm.; tail 135 mm.

Habitat: Borneo (Matang 800—900 feet, Sarawak). — Siam; Tenasserim.

## 22. *Draco obscurus* Boulenger.

*Draco obscurus*, Boulenger, Ann. Nat. Hist. (5) XX 1887, p. 95.

Head small; snout as long as the diameter of the orbit; nostril vertical, directed upwards; tympanum naked, smaller than the eye-opening; eleven upper labials. Gular sac as long as the head, covered with large scales. No nuchal fold or crest. Dorsal scales smooth, equal, not larger than ventrals; a lateral series of widely separated, enlarged, keeled scales. Tail one time

and three fourths the length of head and body. The fore limb extends a good deal beyond the tip of the snout, the hind limb reaches the shoulder.

Brown above, with a few blackish spots; membranes blackish above, below colourless. Throat reticulated with dark brown; gular sac brown, with blackish base; lateral wattles below dark purple. Length of head and body 92 mm.; tail 164 mm.

Type-specimen examined in the British Museum and the specimens in the Paris Museum.

Habitat: Borneo (Kina Balu!).

### 23. *Draco microlepis* Boulenger.

*Draco microlepis*, Boulenger, Proc. Zool. Soc. London 1893, p. 523, pl. XLII fig. 2.

Head small; snout shorter than the diameter of the orbit; nostril vertical, directed upwards; tympanum naked, smaller than the eye-opening. Head-scales very small, keeled, subequal on the snout, six or seven scales across the middle of the interorbital region, fourteen or fifteen across the supraocular region; eleven to fourteen upper labials. Gular sac as long as the head, covered with moderately large scales. No nuchal fold or crest. Dorsal scales equal, keeled, a little smaller than ventrals; a lateral series of a few distant enlarged, keeled scales. Tail without a crest, about twice as long as head and body. The fore limb extends with the whole hand beyond the tip of the snout, the hind limb reaches the shoulder.

Pale grey-brown above, spotted and marbled with dark; membranes with black marblings above, forming five ill-defined transverse bands, below unspotted. Base of the gular sac and lower parts of the lateral lappets purplish; a large black spot on each side of the base of the gular sac in the male. Length of head and body 80 mm.; tail 165 mm.

Type-specimens examined in the British Museum.

Habitat: Borneo (Merabah!, Mt. Dulit!, Sandakan!, Baram!). — Malacca (3500 feet).

### 24. *Draco intermedius* Werner.

*Draco intermedius*, Werner, Mitt. Naturh. Mus. Hamb. XXVII 1910, p. 14.

Head small, fat; snout as long as the diameter of the orbit; nostril vertical, directed upwards; tympanum naked.

Head-scales unequal, a  $\Lambda$ -shaped series of enlarged keeled scales on the snout, enlarged scales at the posterior part of the orbit; twelve to fourteen upper labials, the posterior the largest. No nuchal fold. Dorsal scales small, with a single enlarged, keeled scale on each side of the back, nearer to the hind limbs than to the fore limbs. Tail one time and two thirds the length of head and body. The fore limb extends with the whole hand beyond the tip of the snout, the hind limb reaches between axilla and shoulder.

Light bluish-grey above, with indistinct brown transverse bands, separated anteriorly by whitish cross lines, and with scattered blackish spots; snout and lips blackish; two broad brown, black-edged transverse bands at the interorbital region. Limbs and tail banded with dark, the bands partly broken up into dots. Membranes with many whitish longitudinal lines and indistinct dark cross bands above. Lower parts uniform; throat bluish-grey, with round black spots; gular sac white in the middle; lower parts of the lateral wattles deep black, with a few white spots and separated by a whitish transverse band from the posterior black part of the throat. Length of head and body 90 mm.; tail 152 mm. (After Werner, not seen by me).

Habitat: Sumatra (Bandar Kwala).

**Draco rostratus**, a species described by Günther in Rept. Brit. Ind. 1864, p. 167 and Boulenger, Cat. Liz. I 1885, p. 261, is included as doubtful in the Bornean fauna.

Head small; snout longer than the diameter of the orbit; nostril lateral, directed outwards; tympanum scaly. Head-scales unequal, keeled, those on the median line of the snout the largest; ten upper labials, last largest. Gular sac a little longer than the head. Male with a distinct nuchal crest. Dorsal scales irregular, keeled, those on the vertebral region much larger than ventrals; a lateral series of large keeled scales. Tail about one time and a half the length of head and body. The fore limb extends a good deal beyond the tip of the snout, the hind limb reaches the axilla.

Greyish above, with metallic gloss; membranes with narrow white longitudinal lines and small round black spots above. Throat and base of gular sac with brown dots. Length of head

and body 89 mm.; tail 130 mm. I examined the specimen in the British Museum.

*Draco affinis*, Bartlett, Crocodiles & Liz. Borneo in the Sarawak Museum, Muching 1895 p. 80, similar to *Dr. cornutus*, but without the large spine above the eye and with a very small gular sac, has not been sufficiently described.

Habitat: Borneo (Not seen by me).

## 2. *Aphaniotis* Peters.

(PETERS, Mon. Ak. Berl. p. 385, 1864).

Body compressed; limbs very long and slender, fifth toe longer than first. Dorsal scales small, intermixed with larger ones. A dorsal crest. Gular sac only indicated; no gular fold; tympanum hidden. No praeanal or femoral pores.

Distribution. Malacca; W. Archipelago.

## Key to the Indo-Australian species.

- A.* Snout pointed, much longer than diameter of orbit; above the rostral a convex scale, projecting anteriorly . . . . . 1. *A. acutirostris*, p. 88.  
*B.* Snout rounded, as long as or slightly longer than diameter of orbit; two dark bands between the eyes . . . . . 2. *A. fusca*, p. 90.

### 1. *Aphaniotis acutirostris* Modigl.

*Aphaniotis acutirostris*, Modigliani, Ann. Mus. Civ. Genova (2) VII 1889, p. 115 Tav. I, fig. 1.

Head long, snout pointed, much longer than the diameter of the orbit, with sharp canthus rostralis; tympanum hidden; a small gular sac; head with keeled scales, the scales largest on the middle line, the supraocular region and the occiput. Above the rostral a large scale, convex, directed anteriorly; nostril in a rather large nasal, which is separated from the rostral by a scale. Eight upper and nine lower labials; between the eye and the ear some more enlarged scales. Body compressed, long and slender; a slight dorsal crest, composed of small triangular scales anteriorly, gradually decreasing into a serrated ridge. Dorsal scales keeled, somewhat larger than the

laterals, with a row of enlarged ones on each side of the vertebral line and another row on each side of the back.

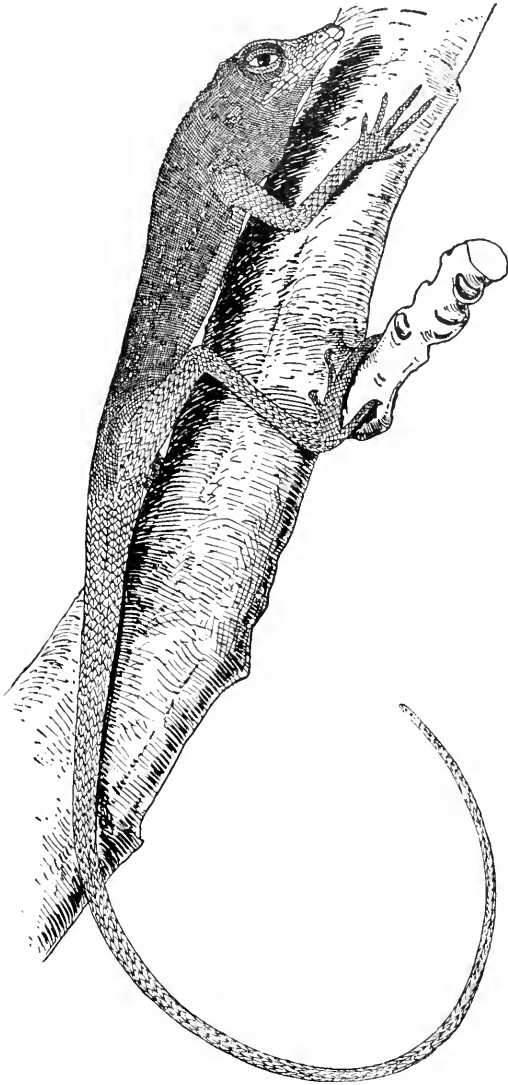


Fig. 44. *Aphanotis acutirostris* Modigl. Natural size.

Ventral scales keeled, much larger than laterals, those on the gular region smaller than the others. Tail cylindrical, very long and slender, twice as long as head and body, covered

with keeled scales. Limbs very long and slender, the fore limb, laid forwards, surpasses the snout by the whole hand, fourth finger longest; the hind limb surpasses the snout by a third of the fourth toe, which is the longest (fig. 45). Limbs covered with keeled scales.

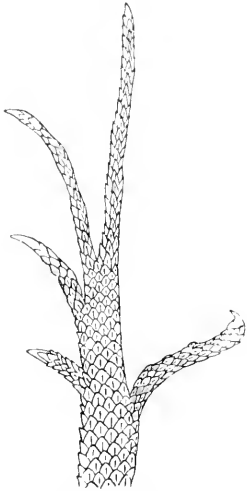


Fig. 45. *Aphaniotis acutirostris* Modigl. Hind limb  
× 2½.

Brown above with darker variegations; sometimes distinct dark lines, radiating from the eye. Inside of mouth blue. Lower parts lighter; throat sometimes with dark spots. Length of head and body 72 mm.; tail 177 mm.

Nom. indig. Sengoeng (Simalur).

Habitat: Simalur!; Nias; Pulu Nako!; Mentawai Islands (Sipora!); Sumatra (Deli!, Sungei bulu); Borneo.

## 2. *Aphaniotis fusca* (Ptrs).

*Otocryptis (Aphaniotis) fusca*, Peters, Mon. Ak. Berl. 1864, p. 385.

*Aphaniotis fusca*, Boulenger, Cat. Liz. I 1885, p. 274.

Snout rounded, as long as or slightly longer than the diameter of the orbit, with sharp canthus rostralis; tympanum hidden, gular sac merely indicated; head with keeled scales, largest on the supraorbital region. Eight upper and eight lower labials. Body compressed, covered with small keeled scales, intermixed with larger ones; a slight dorsal crest. Ventral scales larger than dorsals, keeled. Tail cylindrical, very long. Limbs long and slender, the adpressed hind limb reaches the tip of the snout; fifth toe as long as third.

Brown above; limbs often with light patches; two dark bands across the supraocular region; a dark spot on the snout; inside of mouth pale blue. Lower parts lighter; throat sometimes with dark lines. Length of head and body 60 mm.; tail 150 mm.

Habitat: Simalur!; Nias; Sumatra (Lower Langkat, Palembang); Singkep; Natuna Islands; Borneo (Santubong, Sarawak, Mt. Matang). — Malacca.

## 3. *Cophotis* Peters.

(PETERS, Mon. Ak. Berl. p. 1103, 1861).

Body compressed, covered with large irregular scales. Tym-

panum hidden. A dorsal crest; a very small gular sac in both sexes; a slight transverse fold across the throat. No preanal or femoral pores. Tail prehensile.

Distribution. Ceylon; Sumatra.

A single species.

### I. *Cophotis sumatrana* Hubrecht.

*Cophotis sumatrana*, Hubrecht, Notes Leyden Mus. I 1879, p. 243.

*Cophotis sumatrana*, Boulenger, Cat. Liz. I 1885, p. 276.

Head tetrahedral, rather narrow, snout somewhat produced; tympanum hidden; a small gular sac. Upper surface of head covered with small, irregular shields; a rostral appendage, con-

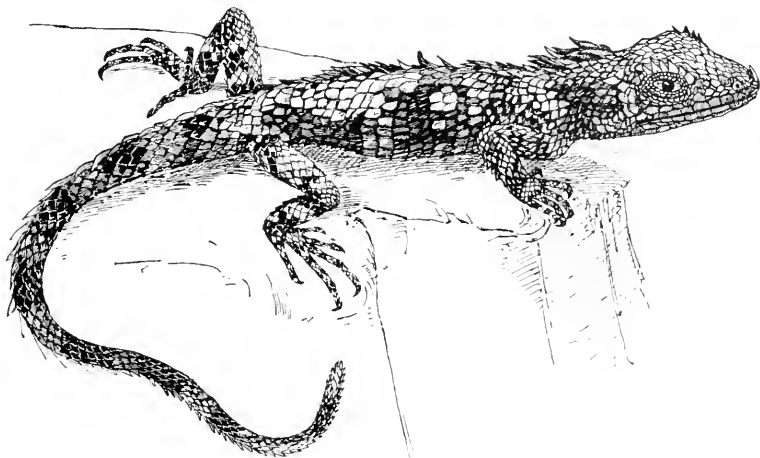


Fig. 46. *Cophotis sumatrana* Hubrecht. Natural Size.

sisting of a single, pointed, hornlike scale, nostril lateral. A fringe of elongated scales along the superciliary ridge; a large pointed scale on both sides behind the eye; nine upper and eight lower labials. Body compressed, covered with very large, imbricate scales, irregularly arranged in transverse rows, their free borders turned downwards; some of them keeled. Nuchal crest composed of nine larger and several smaller scales, elongate and pointed; a dorsal crest, separated from the former, consisting of about 18 similar scales. Tail covered above and below with large scales; a caudal crest of twenty-five scales. Limbs moderate, toes with carinated transverse scales below; third and fourth toes nearly equal.

Light above with broad brown cross bands on back and tail; head marmorated with brown Length of head and body 77 mm.; tail 103 mm.

Habitat: Sumatra! (Padang?).

The type-specimen, the only one known, is in the Leyden Museum.

#### 4. *Japalura* Gray.

(GRAY, Ann. & Mag. Nat. Hist. (2) XII p. 387, 1853).

Body compressed, covered with unequal scales. Tympanum hidden. An oblique fold in front of the shoulder; gular fold present or absent; gular sac small or absent. A dorsal crest. Tail slightly compressed. No preacanal or femoral pores.

Distribution. The East Indies; Southern China.

#### Key to the Indo-Australian species.

- A. Snout short, nearly as long as the diameter of the orbit; canthus rostralis rounded; a small conical rostral appendage . . . . . 1. *J. ornata*, p. 92.
- B. Snout very short, shorter than the diameter of the orbit; canthus rostralis angular; no rostral appendage. . . . . 2. *J. nigrilabris*, p. 93.

#### 1. *Japalura ornata* Lidth.

*Japalura ornata*, v. Lidth de Jeude, Notes Leyden Mus. XV 1893, p. 251.

Snout nearly as long as the diameter of the orbit, with rounded canthus rostralis. A small, conical rostral appendage, lying backwards on the upper part of the head, it measures 2.5 mm. and is covered with small imbricate scales. Tympanum hidden; seven upper and lower labials. A transverse gular fold and an oblique one in front of the shoulder; a slight nuchal crest. Body compressed, covered with keeled, unequal scales, a slight dorsal crest. Limbs very long, especially the hind ones; fifth toe nearly as long as third, much longer than first.

Brownish-red above with small light spots below the eyes. Dark radiating lines from the eye to the upper lip. Length of head and body 57 mm.; (tail broken).

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Sandakan Bay!, Upper-Mahakkam river!, Kina Balu).



The eggs are oval (fig. 42 *d*) and rather large, measuring 15 mm. by 7 mm.

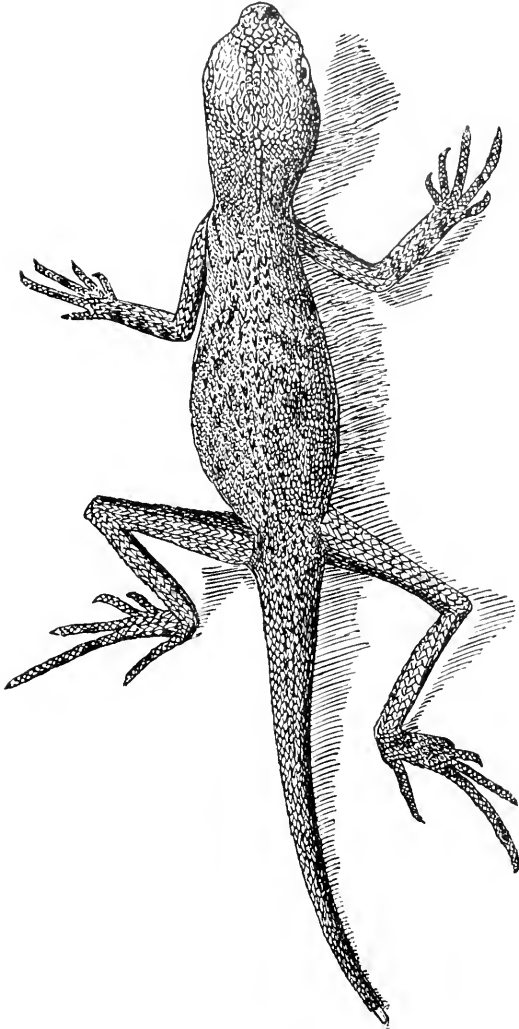


Fig. 47. *Japalura ornata* Lidth.

## 2. *Japalura nigrilabris* (Peters).

*Otocryptis (Japalura) nigrilabris*, Peters, Mon. Akad. Berlin 1864, p. 385.

*Japalura nigrilabris*, Boulenger, Cat. Liz. I 1885, p. 311.

*Pelturagonia cephalum*, Mocquard, Le Natur. XII 1890, p. 144; Nouv. Arch. Mus. (3) II 1890, p. 130 pl. VIII fig. 3.

Snout shorter than the diameter of the orbit, with angular

canthus rostralis; supraciliary edge feebly serrated; tympanum hidden; head-scales irregular, keeled; some larger tubercular scales on the occiput. Thirteen upper and lower labials. Gular scales small, spinose, with larger ones on the sides. Male with a small gular sac; a strong transverse fold across the throat. A slight nuchal crest. Body compressed, covered with small keeled scales and dispersed enlarged ones, which have the points directed upwards; dorsal crest a slight serrated ridge. Ventral scales as large as the largest dorsals, keeled. Tail compressed, triangular at the base, very broad in males, covered with large, strongly keeled scales, those on the edges of the triangle, 7—8, with the keels turned upwards; below with two series of strongly keeled scales. Limbs with unequal scales; fourth finger longer than third; fifth toe as long as third; the hind one reaches beyond the tip of the snout.

Light brown with broad oblique dark bands on the back or brown and green-banded; some larger scales lighter. Lips sometimes dark brown. Lower parts yellowish, marmorated with black. Tail banded with dark and light. Length of head and body 80 mm.; tail 140 mm.

Habitat: Borneo (Saiap, Kina Balu 6000 feet! (types of *Pelturagonia cephalum*), Sawa, Penrissen, Matang, Santubong, Kuching, Mt. Dulit, Mt. Poe, Sarawak, Upper-Mahakkam river!); Natuna Islands.

### 5. *Phoxophrys* Hubrecht.

(HUBRECHT, Notes Leyden Mus. III p. 51, 1881).

Body somewhat depressed, covered with small, smooth scales, intermixed with larger keeled ones and large conical tubercles. Tympanum hidden. No dorsal crest. Upper surface of head covered with conical tubercles; a row of long crest-scales above the eye. No femoral pores.

Distribution. W. Sumatra.

A single species.

#### 1. *Phoxophrys tuberculata* Hubr.

*Phoxophrys tuberculata*, Hubrecht, Notes Leyden Mus. III 1881, p. 51; Midden-Sumatra IV Rept. 1887, p. 18 pl. 1 fig. 3.

*Phoxophrys tuberculata*, Boulenger, Cat. Liz. I 1885, p. 280.

Head small, tetrahedral, with a sharp canthus rostralis,

covered with tubercular scales and keeled tubercles; interorbital region deeply concave. Above the eye large, erect scales, forming a kind of horn-like appendage, higher than half the diameter of the eye. On the posterior part of the head a transverse row of larger scales between the posterior borders

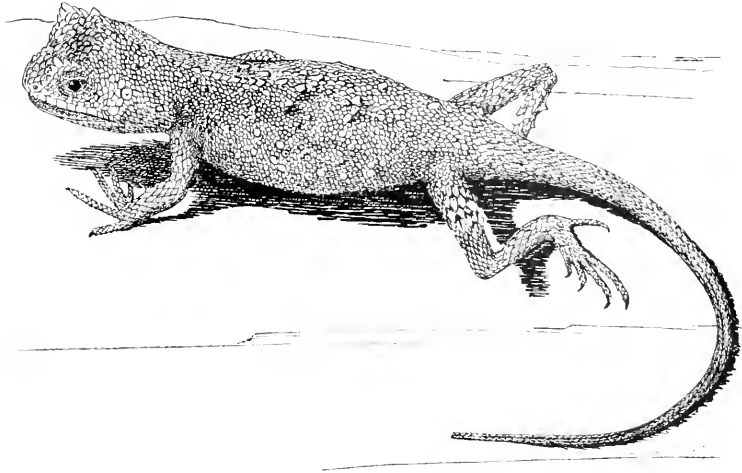


Fig. 48. *Phoxophrys tuberculata* Hubrecht.

of the eyes. Behind the eye and at the angle of the mouth large multicarinate tubercles; ten upper and as many lower labials; throat covered with sharply keeled scales; no gular sac. Body broad, somewhat depressed; flanks with small imbricate scales, which have their free borders turned upwards; back with larger multicarinate tubercles, of which three or four on each side of the median line are more prominent. Ventral scales strongly keeled, larger than those on the sides. Tail one time and a half as long as head and body, covered with keeled scales, the inferior ones the largest. Limbs long and slender; digits long and thin, keeled below; the hind limb, laid forwards, reaches the corner of the mouth, the fore limb, laid backwards, does not reach the thigh; the limbs are covered with strongly keeled scales, intermixed above with larger multicarinate tubercular ones.

Brown, with indistinct darker variegations; a large dark brown spot on the middle of the head over the supraocular regions, and another on the gular region. Length of head and body 43 mm. (tail broken).

Habitat: W. Sumatra (Batang Singalang!).

The type-specimen, the only one ever captured, has been for years in the Leyden Museum, preserved in spirit; its colours have nearly all faded.

### 6. *Harpesaurus* Boulenger.

(BOULENGER, Cat. Liz. I p. 279, 1885).

Body compressed, covered with equal smooth scales. Snout ending in a long compressed cutaneous appendage. Tympanum distinct. Dorsal crest present or absent; no gular sac; no transverse gular fold. No femoral or praeanal pores.

Distribution. Nias; Sumatra; Java.

#### Key to the Indo-Australian species.

A. A dorsal crest.

I. Rostral appendage single; three broad transverse yellow bands on the body. . . . . 1. *H. tricinctus*, p. 96.

II. Rostral appendage double; two transverse yellowish bands. . . . . 2. *H. beccarii*, p. 97.

B. No dorsal crest.

Ventral scales smooth. . . . . 3. *H. ensicauda*, p. 98.

#### 1. *Harpesaurus tricinctus* (A. Dum.).

*Arpephorus tricinctus*, A. Duméril, Cat. Méth. Rept. 1851, p. 93; Arch. Mus. VIII 1856, p. 571.

*Harpesaurus tricinctus*, Boulenger, Cat. Liz. I 1885, p. 279.

Rostral appendage longer than the head, formed of a compressed falciform scale curved upwards, surrounded at the base by a few large scales. Head with small scales, slightly tubercular; a large prominent, triangular scale on the snout; canthus rostralis a serrated ridge. Gular scales tubercular. Body compressed; dorsal crest a low serrated ridge; dorsal scales smooth, equal, in regular transverse series; ventral scales keeled. Tail compressed, with a crest above, slightly higher than the dorsal, covered with keeled scales, below with a double series of spinose scales. Limbs covered with keeled scales.

Brown above, with three broad transverse yellow bands on the body, the anterior the narrowest, on the shoulders, the others descending on the flanks to the belly, where they do not meet. Length of head and body (without rostral appendage) 64 mm.; tail 83 mm.; rostral appendage 21 mm.

Habitat: Java!.

Only one specimen known, preserved in spirit, in the Paris Museum.

2. *Harpesaurus beccarii* Doria.

*Harpesaurus Beccarii*, Doria, Ann. Mus. Civ. Genova (2) VI 1888, p. 646, Tav. VIII fig. 2.

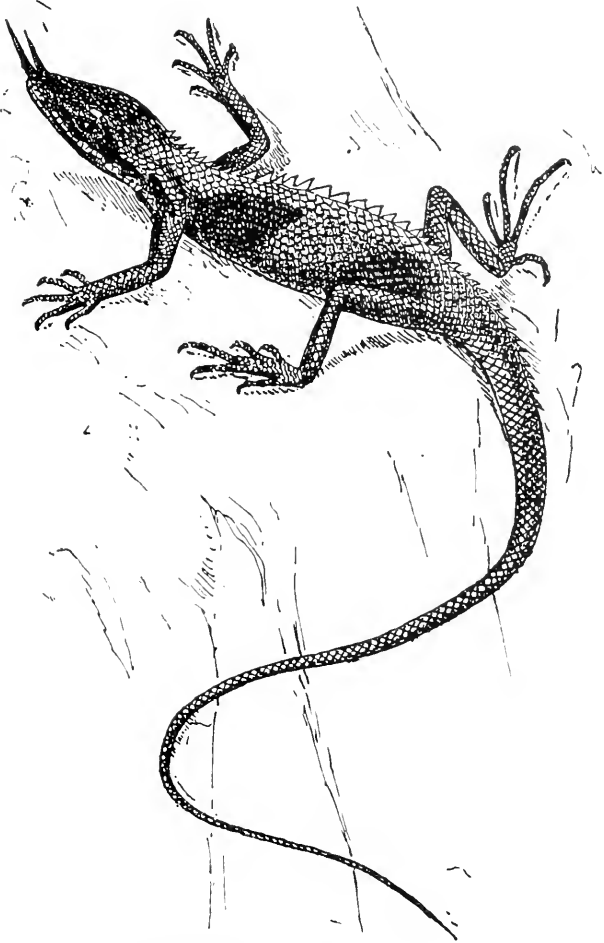


Fig. 49. *Harpesaurus beccarii* Doria. (After Doria).

Rostral appendage double, consisting of an anterior longer and a posterior shorter part, surrounded at the base by a few scales. Head with small scales, those on the snout, on

the interorbital region and on the occiput polygonal, with eccentric tubercles. Rostral broad and low; nostril lateral, in an elongate scale, which is separated from the rostral by a smaller one. Tympanum half the diameter of the eye. Seven or eight upper and seven lower labials. Body compressed, covered with longitudinal series of rhomboidal smooth scales; a low dorsal crest; ventral scales strongly keeled. Tail much compressed, covered below with two longitudinal series of long, keeled scales. Limbs with keeled scales; the hind ones pressed against the body, reach the ear; first finger shortest, second longer than fifth, fourth about as long as third; first toe shortest, second half the length of the third, which is equal to the fourth; claws sharp.

Bluish-green above; on each side of the body two yellowish bands, one beginning with a spot above the ear and running obliquely along the neck and shoulder; the other, beginning at the lores, is continued below the eye and ear as far as the neck and begins again at the base of the fore limb. Two large dark spots on the flanks. Length of head and body (without rostral appendage) 86 mm.; tail 164 mm.; rostral appendage 10 mm.

**Habitat:** Sumatra (Lubu Selassi near Padang). I have examined a specimen with the indication "Indes Neerlandaises" in the Paris Museum.

### 3. *Harpesaurus ensicauda* Werner.

*Harpesaurus ensicauda*, Werner, Mitt. Naturh. Mus. Hamburg XXX 1913, p. 8.

Rostral appendage shorter than the head, curved backwards, surrounded at the base by two enlarged scales. Head with rather large scales, largest on the occiput, those on the snout, the interorbital region and the upper eyelid keeled; canthus rostralis rounded. Gular scales smooth or indistinctly keeled. Body compressed; no dorsal crest; dorsal scales smooth, rather large, arranged in transverse series; ventral scales smooth. Tail strongly compressed, with a denticulated crest above, covered with keeled scales. Limbs covered with keeled scales.

Brown above; upper lip, throat and breast whitish. Length of head and body (without rostral appendage) 60 mm., tail 60 mm. (After Werner, not seen by me).

**Habitat:** Nias.

Only one male specimen known.

7. *Gonyocephalus* Kaup.

(KAUP, Isis p. 590, 1825).

Body compressed, covered with small uniform or unequal scales. Tympanum distinct. A strong transverse gular fold; a gular sac in males. A dorsal crest, well-developed in the male. No preanal or femoral pores.

Distribution. From India to Papuasias and Polynesias; N. E. Australia.

## Key to the Indo-Australian species.

- A. Supraciliary border strongly raised.
- I. Dorsal crest strong, almost as high as the nuchal . . . . . 1. *G. doriae*, p. 100.
  - II. Dorsal crest much lower than the nuchal.
    - a. Ventral scales keeled . . . . . 2. *G. kuhli*, p. 101.
    - b. Ventral scales smooth.
      1. Nuchal crest beginning at the occiput, not higher than the length of the snout. 3. *G. chamaeleontinus*, p. 102.
      2. Nuchal crest beginning at the inter-orbital region, higher than the length of the snout . . . . . 4. *G. sumatranus*, p. 103.
- B. Supraciliary border normally raised.
- I. Dorsal scales unequal.
    - a. Nuchal and dorsal crests continuous.
      - † Ventral scales smooth (or faintly keeled).
        1. Scales at the base of the crest keeled; ventral scales smooth . . 5. *G. liogaster*, p. 103.
        2. Scales at the base of the crest smooth; ventral scales smooth or faintly keeled . . . . . 6. *G. herveyi*, p. 104.
        3. Crest slightly notched on the nape; enlarged dorsal scales in a longitudinal series; throat and sides of neck with unequal scales; ventral scales smooth . . . . . 7. *G. beyschlagi*, p. 105.
      - †† Ventral scales keeled.
        1. Enlarged dorsal scales irregularly distributed . . . . . 8. *G. borneensis*, p. 106.
        2. Enlarged dorsal scales in a lateral longitudinal series . . . . . 9. *G. miotympanum*, p. 106.

- b.* Nuchal and dorsal crests separated.
- \* Ventral scales smooth . . . . . 10. *G. megalopsis*, p. 107.
- \*\* Ventral scales keeled . . . . . 11. *G. ditophus*, p. 108.
- II. Dorsal scales equal.
- a.* Ventral scales smooth . . . . . 12. *G. grandis*, p. 109.
- b.* Ventral scales keeled.
1. Below the ear some large, flat scales.
- † Crest continuous . . . . . 13. *G. binotatus*, p. 110.
- †† Crest subcontinuous, with a notch above the shoulder.
- a.* Gular scales smooth; dorsal crest lower than nuchal; tympanum smaller than eye-opening; gular fold black or grey . . . . . 14. *G. nigrigularis*, p. 111.
- b.* Posterior gular scales keeled; dorsal crest higher than nuchal; tympanum larger than eye-opening . . . . . 15. *G. godeffroyi*, p. 112.
- ††† Crests separated . . . . . 16. *G. papuensis*, p. 113.
2. No large scales below the ear.
- a.* Nuchal crest low, formed of 4—6 widely separated scales; dorsal crest indistinct; gular scales very small, granular; dorsal scales small, keeled . . . . . 17. *G. modestus*, p. 113.
- b.* Nuchal and dorsal crests continuous, latter lower; gular scales small, keeled; dorsal scales strongly keeled . . . . . 18. *G. geelvinkianus*, p. 114.
- c.* Nuchal and dorsal crests low, subcontinuous; gular scales small, smooth; dorsal scales small, keeled; a black spot on each side of the head . . . . . 19. *G. auritus*, p. 115.
- d.* Nuchal and dorsal crests subcontinuous, notched, latter lower; gular and dorsal scales small, almost smooth . . . . . 20. *G. bruyini*, p. 115.

### I. *Gonycephalus doriae* Peters.

*Gonycephalus Doriae*, Peters, Mon. Berl. Ac. 1871, p. 570; Ann. Mus. Civ. Genova III 1872, p. 28, pl. III, fig. 1.  
*Gonycephalus doriae*, Boulenger, Cat. Liz. I 1885, p. 284.

Snout slightly longer than the diameter of the orbit; canthus rostralis strongly projecting; supraciliary borders strongly raised, forming an angle in its posterior part; tympanum distinct, smaller than the eye-opening. Head-scales small, smooth; no enlarged scales on the temple; twelve upper and lower labials.



A gular sac with serrated anterior edge, covered with smooth scales. Body strongly compressed; nuchal and dorsal crests continuous, almost equal, beginning between the posterior border of the orbits, its height not quite the diameter of the orbit; it is composed of triangular scales, covered at the base with large quadrangular ones. Dorsal scales small, equal, smooth, slightly imbricate; ventral scales large and smooth. Tail strongly compressed, a serrated edge above and covered with smooth scales except two inferior series, which are larger and strongly keeled; it measures one time and a half the length of head and body. Limbs slender, the adpressed hind limb reaches the orbit; third and fourth fingers equal.

Olive-brown or greenish above, with dark spots on each side of the back; tail with dark annuli. Young ones with dark spots round the eye, on the lips, and a dark gular fold. Length of head and body 131 mm.; tail 200 mm.

Habitat: Borneo (Tandjong!, Sarawak!, Mt. Buri on Sadowong river).

## 2. *Gonyocephalus kuhli* (Schleg.).

*Lophyrus Kuhlii*, Schlegel, Bijdr. tot de Dierk. I 1848, p. 5, pl. II.  
*Gonyocephalus kuhlii*, Boulenger, Cat. Liz. I 1885, p. 286.

Snout about as long as the diameter of the orbit; canthus rostralis sharp; supraciliary borders strongly raised, angular posteriorly; tympanum a little smaller than the eye-opening. Head-scales small, unequal, keeled; a few enlarged tubercles round the ear-opening; eleven to thirteen upper and lower labials. Gular sac moderate, with a serrated anterior edge and covered with small keeled scales. Body compressed; nuchal and dorsal crests continuous, former beginning at the occiput and composed of triangular scales as long as the diameter of the eye-opening, with two rows of keeled smaller ones at the base; dorsal crest much lower. Dorsal scales small, smooth, the points directed upwards, with irregularly scattered enlarged ones; ventral scales larger, keeled. Tail compressed, with a serrated upper edge and covered with feebly keeled scales, the inferior largest and strongly keeled; its length one time and three fourths the length of head and body. Limbs long, slender, the hind limb reaches the eye; scales of limbs unequal, keeled; third and fourth fingers equal.

Olive-brown or greenish-brown above, with dark transverse bands; dark brown streaks radiating from the eye, a broad blackish band from the eye, through the ear to the shoulder, bordered above by a light streak. Limbs with dark bands; tail with dark and light annuli. Lower parts yellowish-brown, spotted with black; gular sac bluish, with yellowish lines. Young specimens have dark oblique lines on the throat and the gular fold black. Length of head and body 98 mm.; tail 160 mm.

Habitat: Java (Buitenzorg, Tjibodas 1425 M., Willis Mts., Volcano Tjisurupan, Nongkodjadar in Tengger Mts. 1300 M.).

### 3. *Gonycephalus chamaeleontinus* (Laur.).

*Iguana chamaeleontina*, Laurenti, Syn. Rept. 1768, p. 47.

*Gonycephalus chamaeleontinus*, Boulenger, Cat. Liz. I 1887, p. 285 (s. syn.).

Snout as long as the diameter of the orbit, with a rounded elevation in the female; canthus rostralis projecting; supra-ciliary borders strongly raised, angular posteriorly; tympanum distinct, about half the diameter of the eye-opening. Head-scales moderate, slightly unequal, smooth; a few enlarged tubercles above the ear; ten to twelve upper and eleven to fourteen lower labials. Gular sac large, with a serrated anterior edge, covered with small smooth scales. Body strongly compressed; nuchal and dorsal crests continuous, beginning on a line with the posterior border of the orbit, the former very high, its height equals the length of the snout; it is composed of long compressed scales, with three rows of smaller ones at the base; dorsal crest much lower, reduced to a ridge posteriorly. Dorsal scales very small, smooth, with some enlarged ones here and there; ventral scales much larger, smooth. Tail strongly compressed, with serrated upper edge and covered with large smooth scales (sometimes feebly keeled), and larger keeled inferior ones, its length nearly one time and three fourths that of head and body. Limbs long and slender, the hind limb reaches the posterior border of the orbit; scales of limbs slightly unequal, smooth or faintly keeled; fourth finger a little longer than third.

Olive or greenish above, with dark brown reticulation and transverse bands; dark lines radiating from the eye; tail with dark and light annuli. Lower parts olive or brownish. Length of head and body 156 mm.; tail 256 mm.

Habitat: Mentawai Islands (Sipora); Sumatra (Deli!, Battak Highlands 800—1000 M., Singkarak!, Padang, Bencoolen); Banka!; Natuna Islands; Java! (Sindanglaia, Sukabumi, Tjibodas, Tjisurupan, Willis Mts. 5000 feet, Tengger Mts. 1200 M.).

#### 4. *Gonyocephalus sumatranus* (Schleg.).

*Lophyrus sumatranus*, Schlegel, Bijdr. tot de Dierk. I 1848, p. 5, pl. III fig. 1.  
*Gonyocephalus sumatranus*, Boulenger, Cat. Liz. I 1885, p. 286.

Much like the preceding one, but with higher nuchal crest, higher than the length of the snout; it is composed of narrow long scales, covered at the base with four rows of much smaller, but still rather large scales, and begins at the interorbital region; dorsal crest much lower. Tail one time and three fourths the length of head and body. Limbs long and slender, the hind limb reaches the centre of the eye; scales of limbs unequal, third and fourth fingers almost equal.

Olive above, with dark brown transverse bands or reticulated with dark; flanks with brown reticulation; dark lines radiating from the eye; limbs dark-banded; tail with regular dark and light annuli. Lower parts yellowish-olive; throat with indistinct dark longitudinal lines; gular fold brownish. Length of head and body 141 mm.; tail 253 mm.

Habitat: Sumatra (Deli!, Silago!, Padang!, Palembang).

#### 5. *Gonyocephalus liogaster* (Gthr.).

*Tiaris liogaster*, Günther, Proc. Zool. Soc. London 1872, p. 592, pl. XXXVI.  
*Gonyocephalus liogaster*, Boulenger, Cat. Liz. I 1885, p. 286.

Snout longer than the diameter of the orbit; canthus rostralis sharp, projecting; supraciliary border normally raised; tympanum smaller than the eye-opening. Head-scales small, keeled, largest on the supraorbital region; some enlarged tubercles above and behind the ear; nine to eleven upper and nine to twelve lower labials. Gular sac moderate, without serrated edge and covered with small smooth scales. Body strongly compressed; nuchal and dorsal crests continuous, very high, beginning at the occiput, and formed of long narrow scales, longer than the snout, covered at the base with three rows of smaller keeled ones, the superior row twice as high as the lower. In females the crest is much lower. Dorsal scales very small, smooth or feebly keeled, the points directed upwards, with a

few scattered enlarged ones; ventral scales larger than dorsals, smooth. Tail compressed, with a serrated edge and covered with smooth or feebly keeled scales, the inferior largest and strongly keeled; its length more than twice that of head and body. Limbs long, the hind limb reaches the tip of the snout or beyond, covered with unequal slightly keeled scales; fourth finger a little longer than third.

Olive or brown above, uniform or with dark transverse bands. Limbs banded with dark brown; tail with black and light annuli. Lower parts brownish; gular fold black; gular sac black-spotted, the spots arranged in oblique series, or entirely black. Length of head and body 141 mm.; tail 315 mm.

Habitat: Sumatra (Battak Highlands 1000 M., Taluk!, Indragiri); Borneo (Mt. Poch, Rock Road, Matang, Kuching, Santubong, Samarahan, Sambas Damus 1200 M.!).

#### 6. *Gonyocephalus herveyi* Boulenger.

*Gonyocephalus herveyi*, Boulenger, Cat. Liz. III 1887, p. 493.

Snout a little longer than the diameter of the orbit; supra-ciliary border normal; tympanum smaller than the eye-opening. Head-scales small, unequal, keeled; some enlarged tubercles above and below the tympanum; ten to twelve upper and ten lower labials. Gular sac moderate, covered with smooth scales. Body compressed; nuchal and dorsal crests continuous, composed of long, narrow lobes, the highest, on the nape, longer than the snout; those of the back decreasing in size, covered at the base with smooth scales. Dorsal scales small, smooth, with the points directed upwards; some enlarged scales on the flanks; ventral scales larger, smooth or with a faint keel. Tail compressed, a serrated upper edge at the base, more than twice the length of head and body. Limbs with large, very faintly keeled scales, the hind limb reaches the tip of the snout; fourth finger a little longer than third.

Olive or brown above; occiput and nape sometimes vermicated with black; the enlarged tubercles on the sides usually whitish; tail with dark annuli. Lower parts whitish, the gular fold black. Females and young ones with dark transverse bands on body and limbs; young ones with dark longitudinal lines on the throat. Length of head and body 145 mm.; tail 310 mm.

Type-specimen examined in the British Museum.

Habitat: Natuna Islands (Pulu Laut, Gr. Natuna!). — Malacca.

### 7. *Gonyocephalus beyschlagi* Boettger.

*Gonyocephalus beyschlagi*, Boettger, Ber. Offenb. Ver. Naturk. 29—32 1892, p. 104.  
*Gonyocephalus beyschlagi*, Werner, Verh. Ges. Wien XLVI 1896, p. 12, Taf. 1  
 fig. 5; Zool. Jahrb. Syst. XIII 1900, p. 484.

Snout much longer than the diameter of the orbit; canthus rostralis sharp, projecting; supraciliary border sharp, normal; tympanum distinct, half the diameter of the eye. Head-scales large, unequal, slightly rugose, keeled; a series of enlarged ones on the forehead,  $\Lambda$ -shaped; ten to twelve upper and ten to eleven lower labials. Gular sac moderate, without serrated anterior edge, covered with obtusely keeled or pointed scales; throat with enlarged tubercles scattered between the small scales. Body compressed; nuchal and dorsal crests continuous, almost equal, slightly notched on the nape; it has about half the height of the body, continued at the base of the tail and formed of sharply pointed united lobes, covered at the base with two or three rows of scales. Dorsal scales minute, conical, pointing upwards; a regular longitudinal series of enlarged tubercles on each side; ventral scales rather large, smooth. Tail strongly compressed, with a high crest on its base, which ends at about 20 mm.; upper caudal scales feebly keeled, lower larger and the two inferior series strongly keeled; its length about two times and a half that of head and body. Limbs with equal, keeled scales; the hind limb reaches beyond the tip of the snout; fourth finger a little longer than third.

Greenish-grey above, with a longitudinal yellowish-white streak on the nape above the tympanum, an oblique light streak near the axilla; row of tubercles along the back whitish; flanks with a dark network, including large yellow spots. Limbs with narrow light bands and light keels of the scales; tail with eleven light and dark annuli. Lower parts yellowish; throat somewhat darker. Length of head and body 116 mm.; tail 277 mm. (Not seen by my).

Habitat: Sumatra (Upper and Lower Langkat, Deli).

8. *Gonyocephalus borneensis* (Schleg.).

*Lophyrus borneensis*, Schlegel, Bijdr. tot de Dierk. I 1848, p. 6, pl. III fig. 2.  
*Gonyocephalus borneensis*, Boulenger, Cat. Liz. I 1885, p. 288.

Snout longer than the diameter of the orbit; canthus rostralis sharp; supraciliary borders normally raised; tympanum distinct, nearly half the diameter of the eye-opening. Head-scales small, keeled, those on the supraorbital region larger and strongly keeled; on the forehead a series of larger scales  $\wedge$ -shaped; above and below the ear some enlarged tubercles; nine to twelve upper and lower labials. A gular sac, without serrated anterior edge, covered with obtusely keeled, small scales. Body compressed; nuchal and dorsal crests continuous, beginning at the posterior border of the occiput; the nuchal and anterior dorsal part formed of long, narrow scales, covered at the base with smaller, sharply pointed and keeled scales, its greatest height, at the nape, equals the length of the snout. Dorsal scales very small, keeled, with a few enlarged ones here and there; ventral scales much larger, keeled. Tail compressed, a serrated edge above, covered with keeled scales, those below larger and strongly keeled; its length about twice the length of head and body. Limbs long and slender, the hind limb nearly reaches the tip of the snout; scales of limbs slightly unequal and keeled; third and fourth fingers almost equal.

Light brown above, reticulated with dark brown, and with dark transverse bands on the back and limbs, the large scales whitish; the light brown colour slightly tinged with bluish; dark lines radiating from the eye; a light black-edged transverse band at the supraorbital region; gular sac in males bluish, with an orange streak on each side; gular fold black; tail with broad dark and narrow light annuli. Lower parts yellowish; throat with dark brown longitudinal lines. Length of head and body 130 mm.; tail 275 mm.

Habitat: Sumatra (Deli); Borneo (Kidi district, Sarawak, Sandakan Bay!, Samarinda!). — Malacca.

9. *Gonyocephalus miotypanum* (Gthr.).

*Tiaris miotypanum*, Günther, Proc. Zool. Soc. London 1872, p. 592, pl. XXXVII fig. B.

*Gonyocephalus miotypanum*, Boulenger, Cat. Liz. I 1885, p. 287.

Snout as long as the diameter of the orbit; canthus rostralis

sharp; supraciliary border normal; tympanum distinct, much smaller than the eye-opening. Head-scales small, keeled; those on the supraocular region largest; a few tubercles below the ear-opening; ten upper and nine lower labials. A gular sac, without a serrated anterior edge, covered with feebly keeled scales. Body compressed; nuchal and dorsal crests continuous, formed of long, narrow scales, covered with two or three rows of sharply pointed, smaller ones at the base; its height exceeds the length of the snout. Dorsal scales with a longitudinal series of enlarged ones, rest of scales equal; ventral scales feebly keeled. Tail compressed, covered with keeled scales; a low crest of pointed scales at the base; its length more than twice that of head and body. Limbs with equal, strongly keeled scales; the hind limb reaches the eye; third and fourth fingers equal.

Olive-brown above, with a brown network, enclosing round greenish spots; dark streaks radiating from the eye; limbs and tail with dark annuli. Lower parts unspotted. Length of head and body 124 mm.; tail 295 mm.

Habitat: Borneo! (Labuan, Sandakan Bay!, Merabah, Mt. Dulit, Balingeau).

#### 10. *Gonyocephalus megalepis* (Blkr.).

*Lophyrus megalepis*, Bleeker, Nat. Tijdschr. Nederl. Ind. XX 1860, p. 327.

*Tiaris tuberculatus*, Günther, Proc. Zool. Soc. London 1872, p. 593, pl. XXXVIII.

*Gonyoccephalus tuberculatus*, Boulenger, Cat. Liz. I 1885, p. 291.

*Gonyoccephalus megalepis*, Boulenger, Ann. Nat. Hist. (5) XX 1887, p. 152.

Snout a little longer than the diameter of the orbit; canthus rostralis sharp, projecting; supraciliary border normally raised; tympanum smaller than the eye-opening; occiput concave. Head-scales small, unequal, strongly keeled; behind the ear a few enlarged tubercles, the lower one largest; twelve upper and ten lower labials. Gular sac moderately large, without serrated edge, and covered with smooth scales. Body compressed; nuchal crest separated from dorsal, a little higher than the length of the snout and formed of large lanceolate scales directed backwards, the anterior small, covered at the base by a fold of the skin with three or four rows of keeled scales; dorsal crest as high as posterior part of nuchal, with a single row of keeled scales at the base. In females the crest is much lower. Dorsal scales small, smooth or keeled, with

many enlarged ones, of which the largest sometimes form a longitudinal series along each side at the base of the dorsal crest, and the others form transverse series; ventral scales much larger than dorsals, smooth. Tail strongly compressed, with a crest at the basal part, gradually decreasing, caudal scales keeled, the inferior strongly keeled; its length not quite twice that of head and body. Limbs long, the adpressed hind limb reaches the eye; scales of limbs large, slightly unequal, keeled, third and fourth fingers equal.

Olive or greenish above, with indistinct brownish transverse bands; gular fold black. Limbs and tail with dark and light transverse bands. Lower parts yellowish or olive. Length of head and body 140 mm.; tail 235 mm. (the end broken).

Habitat: Sumatra (Deli!, Agam, Si Rambê near Lake Toba, 1200 M., Singkarah!); Borneo (Santubong).

#### 11. *Gonycephalus dilophus* (Dum. & Bibr.).

*Lophyrus dilophus*, Dum. & Bibr., Erp. Gén. IV 1837, p. 419, pl. XLVI.

*Gonycephalus dilophus*, Boulenger, Cat. Liz. I 1885, p. 290 (s. syn.).

Snout as long as the diameter of the orbit; canthus rostralis sharp; supraciliary borders normally raised; tympanum about as large as the eye-opening.

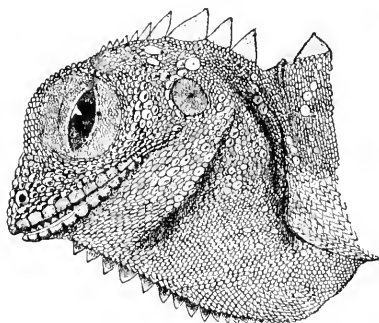


Fig. 50. *Gonycephalus dilophus* (D. B.).  
Young specimen. Head with gular sac.

Head-scales very small, keeled; a series of enlarged scales between the eye and the ear and one bordering the ear anteriorly; a group of enlarged keeled scales below the ear; occipital enlarged; eleven upper and lower labials. Gular sac very large, the anterior edge with large compressed scales; gular scales very small, keeled, with scattered enlarged

ones. Body compressed; nuchal crest separated from dorsal, beginning at the occiput and formed of nine or ten lanceolate scales, the anterior very small, the posterior longer than the snout; it is covered at the base with a fold of the skin, bearing small keeled scales; dorsal crest somewhat lower, continued on the tail. Dorsal scales very small, keeled, the points turned



upwards, intermixed with transverse series of enlarged ones; ventral scales small, larger than dorsals, sharply keeled. Tail compressed, with a crest on its anterior third, as high as the dorsal; caudal scales keeled, especially the inferior; its length one time and a half that of head body. Limbs long, slender, covered with equal, keeled scales, the hind limb reaches the nostril; fourth finger a little longer than third.

Reddish-brown above, with dark transverse bands, sometimes indistinct, dorsal crest olive; the enlarged dorsal scales olive; tail with dark annuli. Lower parts yellowish-brown; gular sac blackish, with light longitudinal lines; the scales of the anterior edge whitish or olive. Length of head and body 220 mm.; tail 330 mm.

**Habitat:** Kei Islands; Aru Islands; Batanta; New Guinea (Jobi, Mafoor, Fak Fak, Sorong, Mt. Epa, Andai, Lobo, Dorei, Passim, Rubi, Mt. Arfak, Mansinam, Etna Bay!, Lorentz river!, Mimika river, Stekwa river, Sekru!, lake Sentani!, Manokwari!, Koime river!, Humboldt Bay!, Begowre river!, Sepik river, Germaniabucht, Eitape, Bongu on Astrolabe Bay, Bogadjim, Sattelberg, 800 M., Katow, Bara Bara, Haveri, Moroka, 2300 feet, Dinawa in Owen Stanley Range, Vikaiku, Madew on St. Joseph river). — Ferguson Island, d'Entrecasteaux Archipelago.

An oval egg of this species is found measuring 34 by 15 mm.

## 12. *Gonyocephalus grandis* (Gray).

*Dilophyrus grandis*, Gray, Cat. 1845, p. 239.

*Gonyocephalus grandis*, Boulenger, Cat. Liz. I 1885, p. 298.

Snout longer than the diameter of the orbit; canthus rostralis sharp; supraciliary border normally raised; tympanum distinct, about as large as the eye-opening. Head-scales small, unequal, keeled, the largest on the canthus rostralis and the supraorbital borders; one or two enlarged tubercles above the ear-opening; ten to thirteen upper and lower labials. A moderate gular sac, no serrated edge, covered with small smooth scales. Body compressed; nuchal and dorsal crests separated by a deep notch, the height of the former is about the length of the snout, latter a little lower; it is formed of long narrow scales, united together except at the tips, with three rows of smaller smooth scales at the base. In females the crests are much

lower, so that the dorsal one is only a serrated ridge. Dorsal scales very small, equal; ventral scales larger, smooth. Tail compressed with a serrated edge above and covered with smooth scales except the two inferior series, which are enlarged and keeled; its length two times and a half that of head and body or more. Limbs long, slender, covered with equal smooth (or faintly keeled) scales; the hind limb reaches beyond the eye; third and fourth fingers equal.

Brown or olive above, uniform or with dark transverse bands; flanks with pale brown or yellowish round spots. Females and young ones have a dark band behind the eye, through the ear, edged with light and meeting its fellow. Lower parts brownish or yellowish; throat sometimes with dark lines. Length of head and body 155 mm.; tail 405 mm.

Habitat: Nias!; Mentawai Islands (Sipora); Sumatra (Deli!, Singkarak!); Borneo (Baram river, Matang, Mt. Dulit, Pankalan ampat, Simanggang, Kuching, Sarawak, Upper-Mahakkam river!, Sandakan). — Malacca; Rangoon?.

### 13. *Gonyocephalus binotatus* Meyer.

*Gonyocephalus (Hypsilurus) binotatus*, Meyer, Mon. Berl. Ac. 1874, p. 130.

*Gonyocephalus binotatus*, Boulenger, Cat. Liz. I 1885, p. 295.

Snout a little longer than the diameter of the orbit; canthus rostralis not very sharp; supraciliary borders normally raised; tympanum large, as large as the eye-opening. Head-scales small, subequal, keeled; no enlarged scales on the temple; the ear-opening bordered anteriorly by slightly larger scales; a group of large flat white plates below the ear; eleven or twelve upper and lower labials. Gular sac moderate, without serrated edge and covered with small keeled scales intermixed with larger ones, the scales becoming smaller posteriorly. Body strongly compressed; nuchal and dorsal crests continuous, beginning at the occiput, formed of rather small scales, inserted on a fold of the skin, as long as the diameter of the eye-opening on the nape, decreasing posteriorly. Dorsal scales small, equal, keeled, the points directed upwards; ventral scales a little larger, keeled. Tail strongly compressed, with a serrated edge above and covered with small keeled scales, the inferior larger and strongly keeled; its length more than thrice the length of head and body. Limbs long, slender, covered with

small, equal, keeled scales; the hind limb reaches the eye; third and fourth fingers equal.

Reddish-brown above, tinged with blue, spotted with black and with blackish transverse bands; dark lines radiating from the eye; on the sides of the neck a large oval, dark brown, black-edged spot, which is bordered above and behind by a reddish-brown crescent-shaped streak; crest bluish. Limbs and tail with dark bands. Lower parts yellowish or brownish, spotted with dark; gular sac yellowish with brown longitudinal lines. Length of head and body 200 mm.; tail 675 mm.

Habitat: Aru Islands; New Guinea (Jobi, Sorong, Andai, Mansinam, Tami river, Lorentz river!).

#### 14. *Gonyocephalus nigrigularis* Meyer.

*Gonyocephalus nigrigularis*, Meyer, Mon. Berl. Ac. 1874, p. 129.

*Gonyocephalus nigrigularis*, Sauvage, Bull. Soc. Philom. (7) III 1879, p. 51.

*Gonyocephalus nigrigularis*, Boulenger, Transact. Zool. Soc. London XX 1914, p. 255, pl. XXVIII fig. 3.

Snout longer than the diameter of the orbit; canthus rostralis angular, not sharp; supraciliary borders normally raised; occiput concave; tympanum smaller than the eye-opening; cheeks swollen in males. Head-scales small, subequal, keeled; occipital enlarged; some large flat scales below the tympanum; ten to twelve upper and nine or ten lower labials. Gular sac small, without serrated edge and covered with small, smooth scales. Body compressed; nuchal and dorsal crests notched above the shoulder; the former composed of strong scales, about as high as the eye-opening, inserted on a fold of the skin, which is covered with small keeled scales and beginning anteriorly of the ear-opening, the dorsal crest lower, continued on the base of the tail. Dorsal scales small, equal, keeled, the points directed upwards; ventral scales much larger, strongly keeled. Tail compressed, covered with keeled scales, the inferior largest; its length not quite three times that of head and body. Limbs long, covered with equal keeled scales, the hind limb reaches the ear-opening; fourth finger a little longer than third.

Olive-green or brownish above; back with seven or eight transverse black bands, separated by narrow greenish interspaces; each black band with a short greenish bar in the middle; nuchal crest uniformly olive or greenish; head olive; the enlarged flat scales on the cheeks and a row of large scales below the

eye whitish; limbs and tail with black transverse bands. Lower parts greenish or yellowish; throat sometimes with small black spots; posterior part of gular sac and the gular fold black or greyish. Length of head and body 230 mm. tail 650 mm.

Habitat: New Guinea (Rubi, Moaif!, Sermowai river!, Lorentz river!, Mimika river, Stekwa river!).

An egg, contained in a female specimen, measured 34 by 16 mm.

### 15. *Gonyocephalus godeffroyi* (Peters).

*Lophura (Hypsilurus) Godeffroyi*, Peters, Mon. Berl. Ac. 1867, p. 707, Taf. ?  
fig. 1.

*Gonyocephalus godeffroyi*, Boulenger, Cat. Liz. I 1885, p. 295 (s. syn.).

Snout longer than the diameter of the orbit; canthus rostralis not very sharp; supraciliary borders normally raised; occiput concave; tympanum slightly larger than the eye-opening; cheeks swollen in the males. Head-scales small, equal, keeled; occipital enlarged; some very large flat scales below the tympanum; ten to twelve upper and nine to eleven lower labials. Gular sac moderate, without serrated edge, and covered with smooth scales, posteriorly with very small keeled ones. Body compressed; nuchal and dorsal crests subcontinuous, notched above the shoulder; the former composed of strong scales, inserted on a fold of the skin, which is covered with small keeled scales; its height about the diameter of the tympanum, the anterior spines lower, beginning at the occiput; the dorsal crest higher, supported at the base by the processes of the vertebrae. Females and young ones with low crests. Dorsal scales small, equal, keeled, the points directed upwards; ventral scales larger, strongly keeled. Tail compressed, with a crest on the basal part and covered with keeled scales, the inferior largest; its length more than three times that of head and body. Limbs long, covered with subequal, keeled scales, the hind limb reaches between the orbit and the tip of the snout; third and fourth fingers almost equal.

Dark brown above, with lighter transverse bands, and numerous black spots. Lower parts yellowish. Young ones olive or greenish with black cross bands. Limbs and tail with blackish bands. Length of head and body 235 mm.; tail 800 mm.

Habitat: New Guinea (Lorentz river!; Stephansort). —

Pelew Islands; Bismarck Archipelago; Solomon Islands; Admiralty Islands; Fiji Islands; N. Queensland.

16. *Gonyocephalus papuensis* (Macleay).

*Tiaris papuensis*, Macleay, Proc. Linn. Soc. N. S. W. II 1878, p. 101.

*Gonyocephalus (Lophosteus) albertisii*, Peters e Doria, Ann. Mus. Civ. Genova XIII 1878, p. 377.

*Gonyocephalus papuensis*, Boulenger, Cat. Liz. I 1885, p. 297.

Much resembling *G. binotatus*, from which it differs on the following characters: tympanum much larger than the eye-opening; nuchal and dorsal crests separated; latter supported in its base by the spinose processes of the vertebrae.

Pale brown above, tinged with reddish, with brown reticulations and traces of dark transverse bands; dark lines radiating from the eye; a similar dark oval spot on the side of the neck as in *G. binotatus*, also bordered above and behind by a pale brown streak, ending on the fore limb. Limbs and tail barred with dark. Lower parts brownish; gular sac bluish, with brown longitudinal lines. Length of head and body 160 mm.; tail 520 mm.

Habitat: New Guinea! (Yule Island!, Nicura, Bongu, Astrolabe Bay!, Bogadjim, Sattelberg, Dinawa, 4000 feet, Gerekanumu, Haveri, Aleya, Fife Bay). — Ferguson Island; Trobiand Island.

17. *Gonyocephalus modestus* Meyer.

*Gonyocephalus (Hypsilurus) modestus*, Meyer, Mon. Berl. Ac. 1874, p. 130.

*Gonyocephalus modestus*, Boulenger, Cat. Liz. I 1885, p. 294 (s. syn.).

Snout slightly pointed, about as long as the diameter of the orbit; canthus rostralis not very sharp; supraciliary borders normally raised; tympanum as large as the eye-opening. Head-scales very small, equal, keeled, occipital enlarged; below the ear a single enlarged tubercle; nine to twelve upper and seven or eight lower labials. Gular sac small, without serrated edge and covered with small granular scales. Body compressed; nuchal crest composed of four to six short, widely separated, triangular scales, the first above the tympanum; no dorsal crest, but a median series of keeled scales. Dorsal scales very small, equal, keeled, the points directed upwards; ventral scales larger, keeled. Tail compressed, with median series of

larger keeled scales above, all the scales keeled, inferior largest; its length more than two times and a half that of head and body. Limbs long and very slender, covered with equal, keeled scales, the hind limb reaches the tip of the snout; fourth finger a little longer than third.

Olive-brown above; dark streaks radiating from the eye; limbs and tail with dark transverse bands. Lower parts yellowish, variegated with olive and sometimes with a bluish tint; throat and gular sac sometimes with round black spots. Length of head and body 90 mm.; tail 245 mm.

Habitat: Aru Islands; New Guinea (Jobi, Liki!, Krudu islands, Sorong, Mt. Epa, Dorei Hum, Dorei, Andai, Moaif!, Sermowai river!, Humboldt Bay!, Tanah-Merah Bay!, Koimé river!, Jaona!, Lorentz river!, Mimika river, Utakwa river, 3000 feet, Sepik river, Bongu on Astrolabe Bay, Sattelberg, Dinawa, Gerekanumu, Haveri, St. Joseph river). — Bismarck Archipelago; Admiralty Islands.

#### 18. *Gonyocephalus geelvinkianus* Peters & Doria.

*Gonyocephalus (Arua) geelvinkianus*, Peters e Doria, Ann. Mus. Civ. Genova XIII 1878, p. 381.

*Gonyocephalus geelvinkianus*, Boulenger, Cat. Liz. I 1885, p. 294.

Head flat above; supraciliary borders normally raised. Head-scales strongly keeled; those below the ear small, without enlarged ones; occipital distinct; eight to ten upper and eight or nine lower labials. A gular sac, covered with small keeled scales. Body compressed; nuchal and dorsal crests continuous, the former composed of lanceolate scales, covered at the base with a fold of the skin, decreasing between the shoulders and continued in the low dorsal crest. Dorsal scales small, equal, sharply keeled, the scales pointing upwards; ventral scales twice as large as laterals and also strongly keeled. Tail compressed, thrice as long as head and body. Limbs slender.

Reddish-brown, bluish or olive-green above, dotted with black, the dots sometimes forming a dark network; limbs and tail banded with brown. Length of head and body 100 mm.; tail 300 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Mafoor!, Mysore).

19. *Gonyocephalus auritus* Meyer.

*Gonyocephalus (Hypsilurus) auritus*, Meyer, Mon. Berl. Ac. 1874, p. 130.

*Gonyocephalus (Arua) auritus*, Peters e Doria, Ann. Mus. Civ. Genova XIII, 1878, p. 382.

*Gonyocephalus auritus*, Boulenger, Cat. Liz. I 1885, p. 295; Trans. Zool. Soc. London XX 1914, p. 225, pl. XXVIII, fig. 3.

Snout a little longer than the diameter of the orbit; canthus rostralis sharp; supraciliary borders normally raised; tympanum as large as the eye-opening. Head-scales small, subequal, keeled, the occipital enlarged, those below the ear small; between the eye and the ear a few enlarged ones; nine or ten upper and eight or nine lower labials. Gular sac large, without serrated edge, covered with small smooth scales, the anterior largest. Body compressed; nuchal and dorsal crests subcontinuous, notched above the shoulder; the former composed of triangular scales, separated from each other, inserted on a fold of the skin, longer than the diameter of the tympanum; latter much lower, covered at the base with very small keeled scales. Dorsal scales small, equal, keeled; ventral scales a little larger and strongly keeled. Tail compressed, with a serrated edge above and covered with small keeled scales, the inferior largest; its length not quite thrice that of head and body. Limbs long, slender, covered with equal, keeled scales; the hind limb reaches between the eye and the nostril; fourth finger a little longer than third.

Dark brown above, reticulated with blackish; black lines radiating from the eye; a black spot on each side of the head, involving the ear and bordered by a reddish-brown streak, which extends to below the eye; sometimes the black spot is broken up into smaller ones. Limbs and tail with dark bands. Lower parts yellowish-brown; throat reddish, gular sac bluish with a network of brown and black. Length of head and body 125 mm.; tail 349 mm.

Habitat: New Guinea (Jobi, Fak Fak!, Sorong, Dorei Hum, Dorei, Passim, Rubi, Wendési!, Mimika river!, Stekwa river, Utakwa river, 2500 feet, Lorentz river!, Etna Bay!, Bogadjim on Astrolabe Bay).

20. *Gonyocephalus bruyni* Ptrs. & Doria.

*Gonyocephalus (Hypsilurus) Bruynii*, Peters e Doria, Ann. Mus. Civ. Genova XIII 1878, p. 379.

*Gonyocephalus bruynii*, Boulenger, Cat. Liz. I 1885, p. 295.

Canthus rostralis rounded, supraciliary borders normally raised; occiput concave. Head-scales strongly keeled, those below the ear a little larger, subequal; ten to twelve upper and nine or ten lower labials. Gular sac not much developed (the specimen probably being a female) and covered with small, almost smooth scales. Body compressed; nuchal and dorsal crests subcontinuous, notched on the shoulder; the former a little higher than the latter and formed of about six lanceolate scales. Dorsal scales small, equal, hardly keeled, in transverse series; ventrals much larger and strongly keeled. Tail compressed, long, nearly three times and a half the length of head and body.

Bluish-brown above, with black spots along the base of the dorsal crest and dark dots irregularly distributed; limbs and tail with indistinct dark bands. Lower parts whitish. Length of head and body 130 mm.; tail 450 mm. (After Peters & Doria, not seen by me).

Habitat: New Guinea (Mt. Arfak).

### 8. *Lophocalotes* Günther.

(GÜNTHER, Proc. Zool. Soc. p. 593, 1872).

Body compressed, covered with large subequal, keeled scales. A dorsal crest. No gular sac; a transverse gular fold; tympanum distinct. Digits not keeled inferiorly. No femoral or preanal pores.

Distribution. Sumatra.

A single species.

#### 1. *Lophocalotes ludekingi* (Bleeker).

*Calotes Ludekingii*, Bleeker, Nat. Tijdschr. Nederl. Ind. XX 1860, p. 326.

*Lophocalotes interruptus*, Günther, Proc. Zool. Soc. London 1872, p. 593, pl. XXXVII fig. A.

*Lophocalotes interruptus*, Boulenger, Cat. Liz. I 1885, p. 275, III 1887, p. 492.

*Lophocalotes Ludekingii*, Boulenger, Ann. Nat. Hist. (5) XX 1887, p. 152.

Head large, swollen below the ears, very distinct from neck; snout longer than the diameter of the orbit; tympanum much larger than the eye-opening. Upper head-scales irregular, feebly keeled; supraorbital scales small, strongly keeled, bordered inwards by a row of larger scales; two or three large scales in a series on the temple; a small tubercle behind the supra-



ciliary edge and another on each side behind the ear opening. Seven or eight upper and eight lower labials; gular scales smooth or feebly keeled, those on the median line the smallest, the laterals larger than the ventrals. Body compressed; nuchal crest formed of lanceolate, sharply-pointed spines, not quite so long as the diameter of the tympanum; dorsal crest, separated

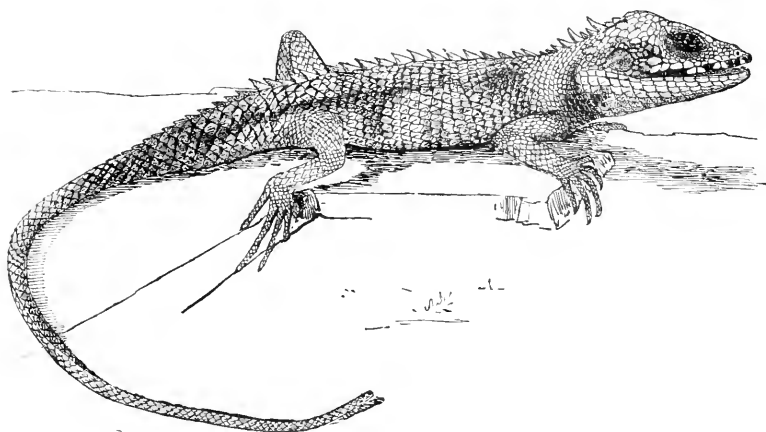


Fig. 51. *Lophocalotes ludekingi* (Bleeker).

from the former, formed by about fourteen triangular spines, every alternate median scale being a spine. Dorsal scales large, feebly keeled, the points of the upper scales directed upwards; ventral scales smaller than dorsal, strongly keeled. Tail compressed at the base, covered with uniform keeled scales; its length nearly equals one time and three fourths that of head and body. Limbs with subequal keeled scales, some of which are spinose; fourth finger and toe slightly longer than third; the hind limb, laid forwards, nearly reaches the tympanum.

Green above, with irregular yellowish markings, forming spots or cross bars on head and body and cross bars on the limbs. Length of head and body 92 mm.; tail 152 mm.

Habitat: Sumatra (Mt. Singalang, 2800 M., Alahan Pandjang!, Agam).

#### 9. *Dendragama* Doria.

(DORIA, Ann. Mus. Civ. Genova (2) VI p. 649, 1888).

Body compressed, covered with equal or slightly unequal

scales. Tympanum distinct. A slight dorsal crest. A gular sac; no fold across the throat; no fold in front of the shoulder. No praeanal or femoral pores.

Distribution. Sumatra; Java.

### Key to the Indo-Australian species.

- A.* Lateral scales equal, smaller than dorsals; limbs long . . . . . 1. *D. boulengeri*, p. 118.  
*B.* Lateral scales unequal, larger than dorsals; limbs short . . . . . 2. *D. fruhstorferi*, p. 119.

#### 1. *Dendragama boulengeri* Doria.

*Dendragama Boulengeri*, Doria, Ann. Mus. Civ. Genova (2) VI 1888, p. 649 Taf. VIII fig. 1.

Head quadrangular with sharp canthus rostralis; snout one time and a half to two times as long as the diameter of the eye; tympanum smaller than the eye. From snout till halfway the

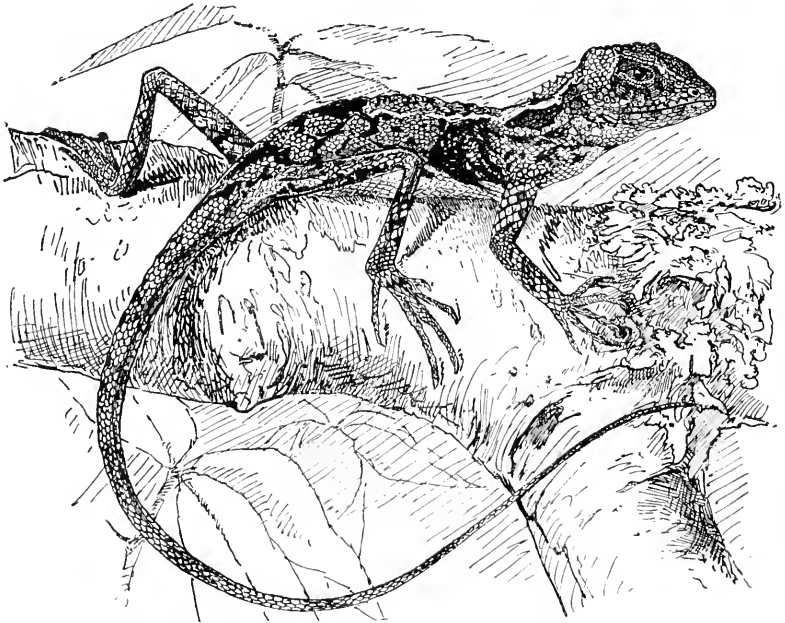


Fig. 52. *Dendragama boulengeri* Doria.

ocular region a series of large strongly keeled scales. Nostril in an oval scale, separated from the rostral, which is small; a smooth supranasal. Behind the supraciliary edge a short

spine; on the temples three or four enlarged keeled scales; below the angle of the mouth and below the ear two white tubercular scales; supraocular region with large, keeled scales. Eight to ten upper and nine or ten lower labials. Gular sac rather small, covered with feebly keeled scales. Body compressed; nuchal crest consisting of 6—7 erect scales, longer than those of the dorsal crest, which is composed of 13—14 scales and is separated from the former. Each scale of both crests separated from the next by two scales. Dorsal scales feebly keeled, as large as ventrals, which are strongly keeled; laterals much smaller, almost smooth, in longitudinal series, 68—75 in a series. Tail compressed, covered at the base with strongly keeled scales. Limbs long, the hind limb, stretched forwards, reaches between the eye and the tip of the snout; they are covered with keeled scales; fourth toe somewhat longer than third; digits with two keels below.

Bluish-green above, back, tail and limbs with dark transverse bands. Sides of neck with a yellow stripe, bordering a blackish, oval spot; flanks with dark lines. Lower parts pinkish, spotted with brown. Length of head and body 73 mm.; tail 160 mm.

Habitat: Sumatra (Mt. Singalang 2800 M., Volcano Si Nabung, Si Rambé near Lake Toba, 1200 M.). — I examined a specimen with the indication "Indes Neerlandaises" in the Paris Museum.

## 2. *Dendragama fruhstorferi* Boettger.

*Dendragama fruhstorferi*, Boettger, Zool. Anz. XVI 1893, p. 335.

Head pyramidal with angular canthus rostralis; snout pointed, twice as long as the diameter of the eye; tympanum as large as orbit. Head-scales unequal, smooth or feebly keeled, on the snout a median series of four keeled scales; supraorbital region with strongly keeled scales. A smooth supranasal; nostril in a lateral nasal, separated from the rostral, which is thrice as broad as high. Spine at the supraciliary edge small; two longitudinal series of three large smooth temporal scales. Eight or nine upper and lower labials, next to the latter a series of large, smooth chin-shields. Gular sac small, covered with keeled scales. Body compressed; nuchal crest consisting of 6 very small scales, dorsal crest with 21 still smaller scales.

Dorsal scales rather large, feebly keeled, 48—50 across the middle of the body; lateral scales rhomboidal, unequal, smooth, larger than the dorsals and strongly keeled ventrals. Tail compressed, covered with keeled scales, two thirds of the total length. Limbs rather short, covered with equal, keeled, scales; digits doubly keeled inferiorly, fourth finger longer than third, fourth toe much longer than third; hind limb, stretched forwards, reaches the tympanum.

Grey above, with bluish-grey and brown spots and dark transverse lines; on the flanks 5 or 6 white scales in a longitudinal series. Sides of head white with black spots; limbs and tail with black half-rings above, white with black network below. Lower parts white. Length of head and body 65 mm.; tail 138 mm. (After Boettger, not seen by me).

Habitat: Java (Volcano Tjisurupan.).

#### 10. *Calotes* Cuvier.

(CUVIER, Règne Anim. II p. 55, 1817).

Body compressed, covered with equal scales. Tympanum distinct. Male with a small gular sac, no transverse gular fold or a feeble one. A dorso-nuchal crest. Tail feebly compressed. No femoral or preanal pores.

Some species of this genus can change their colour like chameleons. The eggs are long, spindle-shaped or oval.

Distribution. India; Indo-Australian Archipelago; Philippines.

#### Key to the Indo-Australian species.

- I. Lateral scales pointing downwards.
  - a. Ventral scales larger than latero-dorsals.
    1. Upper dorsal scales pointing upwards.
      - †. Tympanum at least half the diameter of the orbit. . . . . 1. *C. cristatellus*, p. 121.
      - ††. Tympanum less than half the diameter of the orbit. . . . . 2. *C. celebensis*, p. 122.
    2. Only the scales of the row at the base of dorsal crest point upwards . . . . . 3. *C. jubatus*, p. 123.
  - b. Ventral scales not larger than latero-dorsals . . 4. *C. tympanistriga*, p. 123.
- II. Lateral scales pointing upwards. . . . . 5. *C. versicolor*, p. 124.

1. *Calotes cristatellus* (Kuhl).

*Agama cristatella*, Kuhl, Beitr. Zool. Vergl. Anat. 1820, p. 108.

*Calotes cristatellus*, Boulenger, Cat. Liz. I 1885, p. 316 (s. syn.).

*Calotes octospinosus*, Baumann, Zoolog. Jahrb. System. XXXIV 1913, p. 266, fig. B.

Head-scales above small, keeled, slightly enlarged on the supraocular region; two or three compressed scales behind

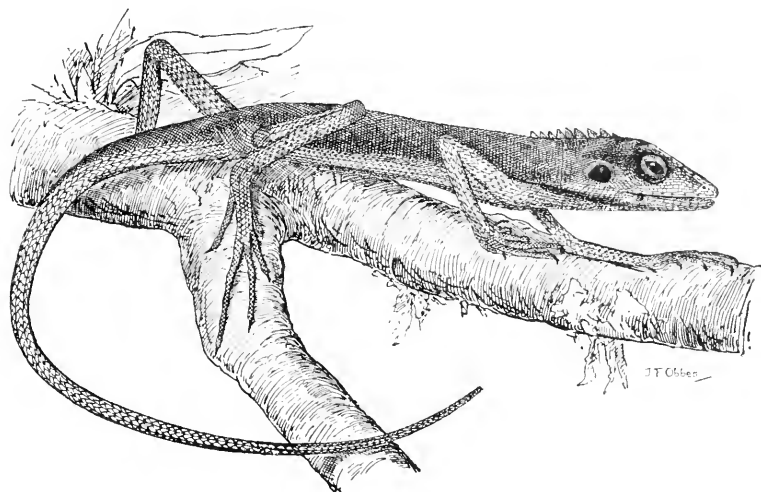


Fig. 53. *Calotes cristatellus* (Kuhl).

the supraciliary edge; tympanum large, half or more than half the diameter of the orbit. Nine upper and lower labials. A small gular sac, with small keeled scales; no oblique fold in front of the shoulder. A nuchal crest of erect spines, the longest shorter than the diameter of the orbit. Body strongly compressed, covered with small, keeled scales, 57—120 round the middle of the body; the upper scales pointing upwards, the others downwards. Dorsal crest a low ridge. Ventral scales largest, strongly keeled. Tail compressed at the base, long. Limbs long, the hind limb reaches beyond the eye; digits long, third and fourth fingers equal, fifth toe shorter than third.

Green above, uniform or with red or brown markings, changing to yellowish, grey-brown or black. Male with gold, red and crimson on lips, cheeks and throat during the breeding season. Length of head and body 130 mm.; tail 440 mm.

Nom. indig. Londok (mal.); Soko (Toradja-name); Seng-goeng (Simalur).

Habitat: Simalur!; Nias!; Pulu Nako!; Mentawai Islands (Sipora); Sumatra (Atjeh, Deli!, Battak Highlands 800—1000 M.! (types of *C. octospinosus* Baumann), Siboga, Indragiri, Langkat, Lampongs, Padang! 1500—3000 feet, Silago, Muara Labu, Fort de Kock!, Kalung!, Manindjau!, Singkarah!, Taluk!, Sidjundjung!, Djambi!, Tandjung Laut, Palembang!, Indrapura); Riou; Java (Buitenzorg, Garut, Willis Mts. 5000 feet, Nongko-djadjar 1300 M.!); Natuna Islands, 1000 feet; Borneo (Saiap, Kina Balu, Labuan, Baram river, Kapuas river, Singkawang, Kuching, Buntok, Sandakan Bay!, Samarinda!, Bandjermassin); Sibutu Island; Celebes (Manado, Posso!, Tomohon, Kema, Kandari, Kottabangon, Palu valley, Tuwa, Bantimurong); Buru; Ceram!; Ambon!; Uliassers!; Goram; Timor Laut; Damma; Misol; Batjan; Ternate!; Halmahera. — Malacca; Philippines.

A very common lizard throughout the whole of the Archipelago, named "Chameleon" by the Europeans. The eggs are long and oval (fig. 42 c).

## 2. *Calotes celebensis* (Gray).

*Bronchocela celebensis*, Gray, Cat. 1845, p. 241.

*Calotes celebensis*, Boulenger, Cat. Liz. I 1885, p. 318.

Head-scales above small, nearly equal, keeled, those on the supraocular region slightly larger; tympanum small, less than half the diameter of the orbit. Nine upper and lower labials; a row of enlarged scales on each side of the chin parallel to the labials. A small gular sac, covered with feebly keeled scales; no fold in front of the shoulder. A nuchal crest of small compressed spines. Body strongly compressed, covered with small keeled scales, 53—67 round the middle of the body, the upper ones pointing upwards; dorsal crest very low. Ventral scales much larger, strongly keeled. Tail slightly compressed, very long, thrice as long as head and body. Limbs long, the hind limb reaches beyond the eye; digits long, third and fourth fingers equal, fifth toe much shorter than third.

Green above, uniform or with brown, red and white markings. Lower parts yellowish-green. Length of head and body 92 mm.; tail 325 mm.

Nom. indig. Soko (Toradja-name).

Habitat: Celebes (Manado, Posso!, Rurukan, Bantimurong near Maros!).

### 3. *Calotes jubatus* (Dum. & Bibr.).

*Bronchocla jubata*, Dum. & Bibr., *Erp. Gén.* IV 1837, p. 397.

*Calotes jubatus*, Boulenger, *Cat. Liz.* I 1885, p. 318 (s. syn.).

Head-scales above rather large, keeled, almost equal; two or three compressed scales behind the supraciliary edge; tympanum large, half or more than half the diameter of the orbit. Nine or ten upper and eight or nine lower labials; a row of slightly enlarged scales on each side of the chin parallel to the labials. A gular sac, with large keeled scales; no fold in front of the shoulder. Nuchal crest large, its spines falciform and directed backwards, the longest about as long as the diameter of the orbit; some rows of smaller spines at the base. Body strongly compressed, covered with large, keeled scales, 43—53 round the middle of the body; the scales of the first row next to the dorsal crest pointing upwards, those of the second row pointing straight backwards, the others downwards; dorsal crest less developed than nuchal, diminishing backwards. Ventral scales largest of all, strongly keeled. Tail very long, round, slightly compressed at the base and with a slight ridge there. Limbs long, the hind limb nearly reaches the nostril; digits long, third and fourth fingers equal, fifth toe much shorter than third.

Green above, with yellow or red spots or bands. Length of head and body 130 mm.; tail 440 mm.

*Habitat*: Singkep; Java (Anjer, Gadok, Krawang, Batavia!, Weltevreden!, Buitenzorg!, Sukabumi!, Tjibodas 1425 M., Mt. Salak, Depok, Bantam, Nusa Kambangan!, Semarang, Wonosobo, Salatiga!, Surakarta!, Willis Mts., Tengger Mts., 1200 M., Prigan, 1800—2300 feet, Surabaia); Bali; Celebes (Manado?); Karakelang Islands!; Salibabu Islands!. — Nicobars; Philippines.

A very common form in Java. The eggs are spindle-shaped (fig. 42 *b*).

### 4. *Calotes tympanistriga* (Gray).

*Bronchocla tympanistriga*, Gray, *Grif. Anim. Kingd.* IX Syn. 1831, p. 56.

*Calotes tympanistriga*, Boulenger, *Cat. Liz.* I 1885, p. 320 (s. syn.).

Head-scales above large, irregular, keeled; small tubercles on the occiput and one behind the supraciliary edge; tympanum

nearly half the diameter of the orbit. Nine or ten upper and nine to eleven lower labials; a row of larger scales on each side of the chin parallel to the labials. A small gular sac, covered with feebly keeled scales; no fold in front of the shoulder. A nuchal crest of small spines. Body strongly compressed, covered with smooth or feebly keeled scales, 43—53 round the middle of the body, the upper ones pointing upwards, the others downwards; dorsal crest a slight ridge. Ventral scales strongly keeled, as large as the dorsals. Tail compressed, long, its base with a sharp upper edge. Limbs long, the hind limb reaches the neck or the tympanum; digits long, fourth finger longer than third, fifth toe as long as third.

Greenish or brownish above, with or without dark olive-brown cross bands. Lower parts lighter, uniform. Length of head and body 79 mm.; tail 185 mm.

Habitat: Sumatra (Pajo); Java (Tjibodas, 1425 M.).

##### 5. *Calotes versicolor* (Daud.).

*Agama versicolor*, Daudin, Hist. Rept. III 1802, p. 395, pl. XLIV.

*Calotes versicolor*, Boulenger, Cat. Liz. I 1885, p. 321 (s. syn.).

Head-scales above large, smooth or feebly keeled, imbricate; those on the supraocular region largest; two spines on each side above the ear; tympanum not quite half the diameter of the orbit. Nine upper and lower labials. A small gular sac; scales on the throat smooth or feebly keeled; no fold in front of the shoulder. Body compressed, covered with keeled scales, 35—57 round the middle of the body, all directed upwards. A dorso-nuchal crest of lanceolate spines, diminished at the posterior part of the back. Ventral scales strongly keeled. Tail round, long. Limbs long, the hind limb reaches beyond the ear or the eye; digits long, fourth finger longer than third, fifth toe somewhat shorter than third.

Brown, yellowish or dark olive-brown, with or without dark transverse spots or light spots and lines. Lower parts sometimes with black longitudinal lines. Male with brilliant red, yellow and black tints in the breeding time. Length of head and body 120 mm.; tail 285 mm.

Habitat: Sumatra (Oleh-leh in Atjeh!). — Malacca; Andamans; India; Ceylon; Southern China.



This species is an Indian form and very rare in the Archipelago, having been found only once in Sumatra<sup>1)</sup>.

## 11. *Acanthosaura* Gray.

(Gray, Griff. An. Kingd. IX Syn. p. 56, 1831).

Body usually compressed, covered with unequal scales. Tympanum distinct; a dorsal crest. No fold across the throat, no gular sac. A slight oblique fold in front of the shoulder. No praeanal or femoral pores.

Distribution. South-Eastern Asia; Sumatra.

A single species.

### 1. *Acanthosaura armata* (Gray).

*Agama armata*, Gray, Zool. Journ. III 1827, p. 216.

*Acanthosaura armata*, Boulenger, Cat. Liz. I 1885, p. 301, pl. XXII, fig. 1 (s. syn.).

Snout as long as or slightly shorter than the diameter of the orbit, with angular canthus rostralis and supraciliary edge;

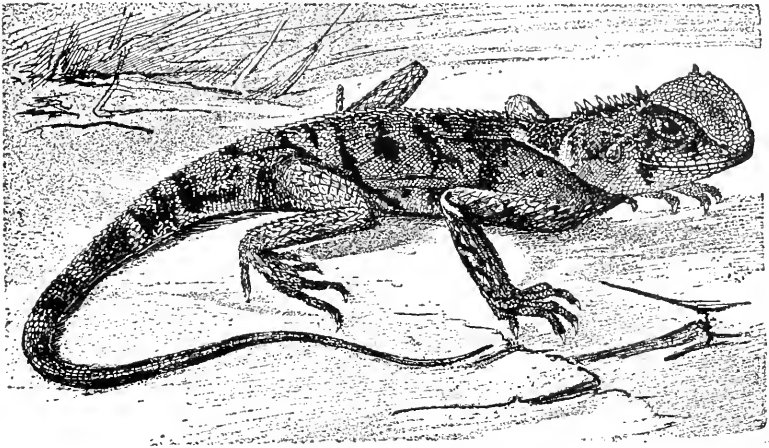


Fig. 54. *Acanthosaura armata* (Gray).

tympanum almost as large as the eye-opening. Head covered with keeled scales, larger on the supraorbital region; a long spine, three fourths of or as long as the diameter of the orbit, behind the supraciliary edge, another on each side of the nape, above the tympanum. Eleven to thirteen upper and twelve to fifteen lower labials. An oblique fold in front

1) The specimen is in the Amsterdam Museum.

of the shoulder; gular scales keeled, smaller than ventrals. Nuchal crest separated from dorsal, composed of large compressed spines, their base hidden under two or three rows of smaller spines, dorsal crest as high as or a little lower than nuchal anteriorly, becoming lower behind, in females much smaller. Dorsal scales small, their points directed upwards, intermixed with large, rhomboidal keeled scales; ventral scales keeled, larger than the enlarged dorsals. Tail compressed, about one time and a half as long as head and body, covered with uniform, strongly keeled scales, larger below. Limbs covered with equal, keeled scales, femur with unequal ones; fourth finger slightly longer than third; hind limb, pressed against the body, reaches between the temple and the nostril.

Colour changeable, brown, blackish, green with lighter or darker spots; dark lines radiating from the eye; sometimes blue spots on body, limbs and tail; a dark band from the interspace between the two crests to the throat. Lower parts yellow, with orange on the chest, lilac on the gular region of the male; inside of mouth orange. Length of head and body 135 mm.; tail 160 mm.

Habitat: Sumatra (Indragiri, Palembang). — Malacca; Tenasserim; Siam; Cochin-China.

This species feeds on worms, which it digs out with its fore limbs. It can change its colour and is a rare form in the Indo-Australian region.

## 12. *Chlamydosaurus* Gray.

(GRAY, in King's Voy. Austr. II, p. 424, 1826).

Body compressed, covered with small keeled scales. Tympanum distinct. Neck with a large dermal expansion on each side, fused on the throat. Tail slightly compressed. Praeanal and femoral pores usually present <sup>1</sup>).

Distribution. New Guinea; Australia.

A single species.

### 1. *Chlamydosaurus kingi* Gray.

*Chlamydosaurus kingii*, Gray, King's Voyage Austr. II 1826, p. 425.

*Chlamydosaurus kingii*, Boulenger, Cat. Liz. I 1885, p. 401.

Head small; snout pointed with sharp canthus rostralis,

<sup>1</sup>) Beddard mentions a male specimen without femoral pores (Proc. Zool. Soc. 1904 II, p. 82).

slightly concave above; head-scales small, keeled; tympanum almost as large as the diameter of the orbit; nostril large, round, nearer to the tip of the snout than to the orbit; thirteen or fourteen upper and thirteen lower labials. The large dermal collar is covered with large keeled scales, its

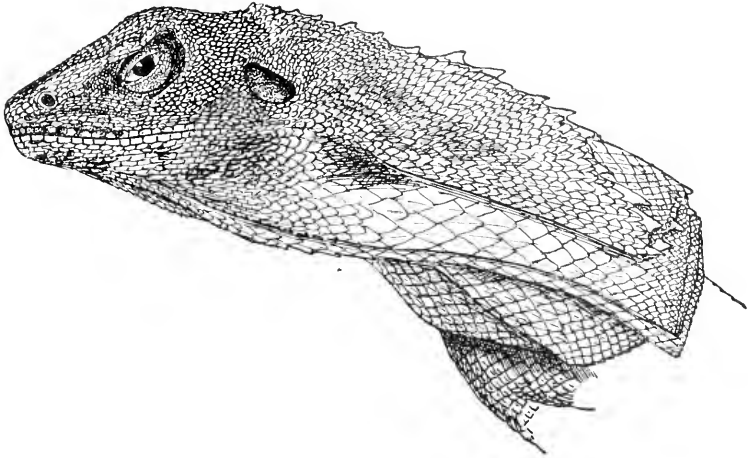


Fig. 55. *Chlamydosaurus kingi* Gray.

The large dermal expansion is folded up against each side of the neck.

dorsal edge is provided with pointed scales. Processes of the hyoid extend through the walls of the membrane. Dorsal scales small, keeled, largest on the vertebral region. Ventral scales larger. Three to eight femoral and one or two praeanal pores. Tail slightly compressed, long, twice as long as head and body, covered with equal, keeled scales, about as large as those on the middle of the body. Limbs long, the hind limb reaches the tympanum or the eye; their scales are equal, keeled; digits long, keeled below.

Brown above, with darker or yellowish markings. Lower parts lighter; inside of mouth bright yellow. Upper surface of membrane tinged with orange, vermilion and blue. Length of head and body 260 mm.; tail 550 mm.

*Habitat*: New Guinea (Sam Senggasi near Okaba). — Australia.

The animal generally lives on trees, but when disturbed it runs on its hind legs in order to escape. If frightened, the dermal expansion is erected and the mouth opened, showing the large teeth and the bright yellow colour of the inside.

13. *Lophura* Gray.

(GRAY, Phil. Mag. II p. 56, 1827).

Body compressed, covered with imbricate, keeled scales, intermixed with large round keeled ones. Tympanum distinct; throat with longitudinal folds; a transverse gular fold. A dorsal crest. Toes covered below with small granular scales, with a lateral fringe of large united scales, broadest on the outer side. Tail strongly compressed, in the adult with a high crest, supported by the large spinose processes of the caudal vertebrae. Femoral pores present.

Distribution. Eastern part of the Archipelago; Philippines.

## Key to the Indo-Australian species.

- A.* Dorsal and nuchal crests continuous; tympanum half the diameter of the orbit; tail more than twice the length of head and body . . . . . 1. *L. amboinensis*, p. 128.
- B.* Dorsal and nuchal crests separated; tympanum one third the diameter of the orbit; tail not quite twice the length of head and body . . . . . 2. *L. weberi*, p. 130.

1. *Lophura amboinensis* (Schlosser).

*Lacerta amboinensis*, Schlosser, Epistola, Amsterdam, 1768.

*Lophura amboinensis*, Boulenger, Cat. Liz. I 1885, p. 402 (s. syn.).

*Hydrosaurus amboinensis*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XI, IV 1912, p. 87.

Head small; snout long, with a small longitudinal crest of somewhat larger scales in the male; other head-scales very small, strongly keeled. Nostril oval, two times and a half nearer the tip of the snout than the orbit; tympanum large, half the diameter of the orbit; eleven upper and twelve lower labials. Gular scales small, unequal; a row of large shields on each side along the lower labials, beginning at the large mental; throat with longitudinal folds. Body compressed, nuchal crest continuous with the dorsal, composed of large lanceolate spines. Dorsal scales small, imbricate, keeled, all turned upwards, intermixed with large, dispersed, rounded, keeled scales. Ventral scales larger than dorsals, smooth, in transverse rows; enlarged scales on the sides of the chest. Femoral pores 7—16 on each side. Tail long, more than twice the length of head and body, covered with small quadrangular keeled scales, much

larger beneath; caudal crest very high in the males at the anterior part of the tail, where it has a denticulated border; the middle part with a double-toothed low crest, the end not

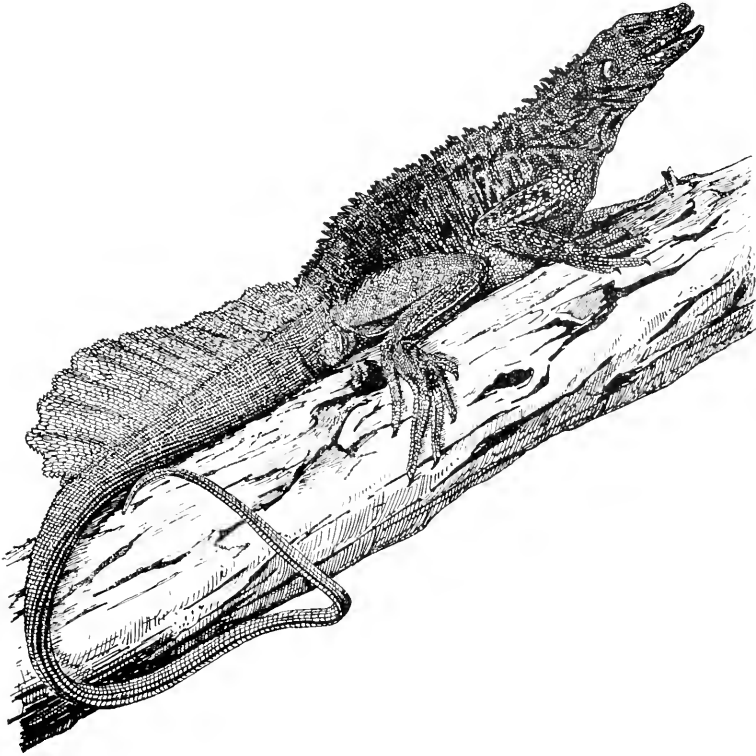


Fig. 56. *Lophura amboinensis* (Schloss.).

crested. Limbs long, the adpressed hind limb reaches the eye or the nostril, covered with keeled scales, much enlarged on the anterior part of the fore limb.

Olive above, variegated with black; fold in front of shoulder black. Length of head and body 345 mm.; tail 750 mm.

Nom. indig. Kalyado (Toradja-name); Soa Soa (Batjan, Ambon).

Habitat: Celebes (Lamontjong, Tempe!, Pampanua!, Paloppo, Macassar!, Posso!, Manado!); Togian Islands; Buton; Ambon!; Ceram!; Batjan!; Ternate!; Halmahera; Waigeu!; New Guinea. — Philippines.

Specimens from Celebes, which have the large keeled scales

of the back arranged in six groups or bands, have been named by Weber <sup>1</sup>): *Lophura amboinensis* Schloss. var. *celebensis* Ptrs. The first group, composed of about 8 scales lies on both sides of the neck; three groups form cross bands on the back, the fifth, smaller one is above the hind limbs and the last on the base of the tail. This form may be a local variety, restricted to Central- and Southern Celebes, specimens being obtained at Tempe, Pampanua, Posso and Macassar (type of *Istiurus microlophus* Bleeker). Some specimens from the Philippines already have an indication of grouping the large round scales.

This species always lives on trees near rivers and swims exceedingly well. As to its occurrence in Java, given in Boulenger's Catalogue, I already pointed out <sup>2</sup>), that this is certainly erroneous.

## 2. *Lophura weberi* (Barbour).

*Hydrosaurus weberi*, Barbour, Proc. biol. Soc. Washington XXIV 1911, p. 20; Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 88, pl. 4, fig. 10.

Head deep and massive; snout short, with a prominent upraised area, covered with enlarged keeled scales; other head-scales small, strongly keeled. Nostril round; tympanum small, one third the diameter of the orbit; gular scales very small, granular; a row of enlarged shields on each side along the lower labials, beginning at the shoulder region, and composed of short, thick, compressed spines; dorsal crest with longer, recurved spines, developed most in the mid-dorsal region. Dorsal scales small, imbricate, keeled, the keels turned upwards; along each side seven groups of two or three very large, roundish keeled scales. (In the female these are not so regularly distributed). Femoral pores 12—13. Tail not quite twice the length of head and body, crested. Limbs long, the adpressed hind limb reaches the tympanum, covered with keeled scales; on the anterior part of the fore limb five or six series of enlarged scales.

Dark brown above, uniform. Lower parts lighter. (After Barbour, not seen by me) <sup>3</sup>).

Habitat: Halmahera; Ternate.

1) Zool. Ergebn. Reise O. Indien I 1890/91, p. 167.

2) Bijdragen Dierk. 19, 1913, p. 22.

3) No measurements given.

14. *Physignathus* Cuvier.

(CUVIER, Règne An. 2nd. ed. II, p. 41, 1829).

Body compressed, covered with keeled scales. Nuchal and dorsal crests present. No gular sac; a strong transverse gular fold. Tympanum distinct. Tail round or compressed. Toes denticulated laterally. Femoral pores present, sometimes absent in females.

Distribution. Siam; Cochin-China; Australia; New Guinea; Kei Islands; Timor Laut.

## Key to the Indo-Australian species.

- A. Tail slightly compressed, not crested.  
 I. Nostril a little nearer the tip of the snout than the orbit; gular scales very feebly keeled . . . 1. *P. temporalis* p. 131.  
 II. Nostril equally distant from the orbit and the tip of the snout; gular scales strongly keeled. 2. *P. maculilabris* p. 132.  
 B. Tail strongly compressed, crested . . . . . 3. *P. lesueurii* p. 133.

1. *Physignathus temporalis* (Günther).

*Grammatophora temporalis*, part., Günther, Ann. Nat. Hist. (3) XX 1867, p. 52.  
*Physignathus temporalis*, Boulenger, Cat. Liz. I 1885, p. 397, pl. XXXI, fig. 4 (s. syn.).

Snout as long as the distance between the orbit and the posterior border of the ear. Nostril a little nearer the tip of the snout than the orbit; tympanum half the diameter of the orbit. Head covered with strongly keeled scales, large on the snout, smaller on the occiput; cheeks swollen, covered with strongly keeled scales, three or four scales at the posterior border more prominent; gular scales very feebly keeled. Body compressed, covered with keeled, imbricate scales, median largest, all obliquely directed upwards; a slight dorsal crest. Ventral scales larger than dorsals, strongly keeled; two femoral and two praeanal pores on each side. Tail slightly compressed, two to three times as long as head and body; a serrated ridge on the upper basal part. Limbs long; toes denticulated laterally.

Reddish-brown above, head darker; dark transverse bands on the back, a light band along each side; head with a light band bordering the upper lip; dark lines radiating from the eye; a broad dark band from the eye, through the ear to

above the cheeks; flanks brown-spotted, with a light line, sometimes indistinct, from axilla to groin; limbs with light spots, bordered posteriorly with dark brown; tail with dark transverse bands and a few blackish spots on each side of the base. Lower parts reddish, with small dark spots; throat dark, with a light longitudinal streak on each side. Length of head and body 101 mm.; tail 313 mm.

*Habitat*: Damma; Babber!; Timor Laut!; Kei Islands; New Guinea (Merauke!, Aroma, Borepata, Inawi, Kelesi!, Dinawa!, Vikaiku, Katow, Mt. Epa, Fly River!). — N. Australia.

## 2. *Physignathus maculilabris* Boulenger.

*Lophognathus maculilabris*, Boulenger, Ann. Nat. Hist. (5) XII 1883, p. 226; Proc. Zool. Soc. 1883, p. 386, pl. XLI.

*Physignathus maculilabris*, Boulenger, Cat. Liz. I 1885, p. 398.

Snout obtuse, as long as the distance between the orbit and the posterior border of the ear. Nostril equally distant from the orbit and the tip of the snout. Head covered with very strongly keeled scales; gular scales strongly keeled. Body compressed, covered with small scales, the upper largest, strongly keeled, obliquely directed upwards; a small dorsal crest. Ventral scales strongly keeled, larger than the largest dorsals<sup>1)</sup>. Tail slightly compressed, with a serrated ridge on the upper basal part. Limbs long; toes denticulated laterally.

Olive above, with blackish transverse markings across the back, tail and limbs; head with two dark transverse bands, bordered with white, the first on the snout, the second on the supraocular region; a broad dark band from orbit to tympanum, bordered inferiorly by a light band, extending to above the fore limb; dark lines radiating from the eye; lips light, with blackish markings. Base of tail with oval blackish spots on each side, bordered with white. Lower parts whitish, dotted all over with blackish. Length of head and body 98 mm.; tail 290 mm.

Type-specimens examined in the British Museum.

*Habitat*: Timor Laut!.

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1) The only two specimens known being females, there are no femoral or praeanal pores.



3. *Physignathus lesueuri* (Gray).

*Lophura lesueurii*, Gray, Griff. An. Kingd. IX, Syn. 1831, p. 60.

*Physignathus lesueurii*, Boulenger, Cat. Liz. I 1885, p. 398 (s. syn.).

Snout a little longer than the diameter of the orbit. Nostril nearer the tip of the snout than the orbit; canthus rostralis,

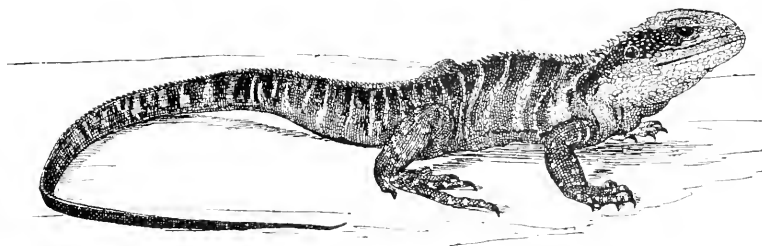


Fig. 57. *Physignathus lesueuri* (Gray).

supraciliary and supraorbital borders forming a ridge; cheeks swollen; tympanum half the diameter of the orbit. Head covered with small, strongly keeled scales; on the occiput and temples some conical and compressed tubercles; gular scales feebly keeled, with irregular longitudinal series of enlarged tubercles on each side; parallel with the lower labials, a series

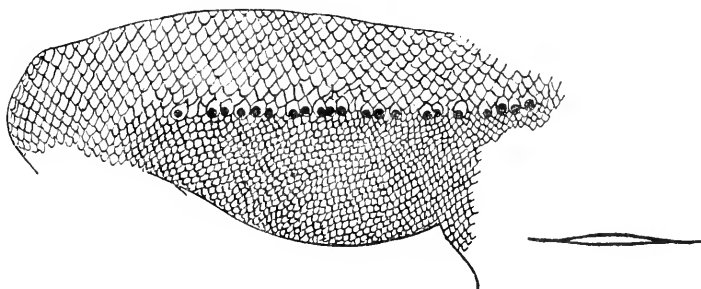


Fig. 58. *Physignathus lesueuri* (Gray). Femoral pores. Nat. size.

of large scales. Body compressed; a nuchal crest of a few triangular spines, implanted on a fold of the skin; dorsal crest much lower. Dorsal scales small, granular, keeled, with irregular transverse series of larger, round, keeled tubercles. Ventral scales keeled, larger than dorsals; sixteen to twenty-two femoral pores on each side (fig. 58). Tail strongly compressed, crested like the back, two times and a half as long as the body;

upper caudal scales intermixed with tubercles at the basal part, lower scales larger. Limbs long, the hind limb reaches between the eye and the tip of the snout.

Dark olive above, with dark and light transverse bands; a broad black band from the eye, through the ear, to above the shoulder. Lower parts pale olive, black-spotted; throat in the young ones with black longitudinal lines. Length of head and body 166 mm.; tail (reproduced) 300 mm.

Habitat: New Guinea (Arfak Mts!)<sup>1)</sup>. — Queensland.

### 15. *Diporophora* Gray.

(GRAY, Zool. Misc. p. 53, 1831).

Body feebly compressed, sometimes slightly depressed. No gular sac; a gular fold present or absent. No dorsal crest. Tympanum distinct. Tail round. One or two praeanal pores on each side, sometimes absent in the female; no femoral pores.

Distribution. Australia; New Guinea.

#### Key to the Indo-Australian species.

- A. No transverse gular fold . . . . . 1. *D. bilineata* p. 134.  
 B. A transverse gular fold . . . . . 2. *D. australis* p. 135.

#### 1. *Diporophora bilineata* Gray.

*Diporophora bilineata*, Gray, Zool. Misc. 1851, p. 54; Zool. Erebus & Terror, Rept. pl. XIX, fig. 1.

*Diporophora bilineata*, Boulenger, Cat. Liz. I 1885, p. 394 (s. syn.).

Head moderate, with an angular canthus rostralis; head-scales strongly keeled, equal; nostril in an oval nasal, separated from the rostral, somewhat nearer the orbit than the end of the snout; tympanum distinct, more than half the diameter of the orbit. No transverse gular fold, a feeble, oblique fold in front of the shoulders, gular scales keeled. Body compressed, covered with equal keeled scales, the keels forming longitu-

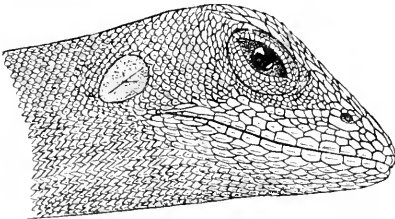


Fig. 59. *Diporophora bilineata* Gray.

<sup>1)</sup> The only specimen, ever captured in the Indo-Australian Archipelago, is in the Leyden Museum.

dinal series, or with a few series of enlarged keeled scales, along the middle of the back; ventral scales larger than dorsals, strongly keeled; two praeanal pores on each side. Tail twice to two times and two thirds as long as head and body. Limbs long, the hind limb, stretched forwards, reaches the tympanum or the eye.

Grey-brown or reddish above, uniform or with dark spots; often two or three light bands on the back. Length of head and body 70 mm.; tail 190 mm.

Habitat: New Guinea (Fly River, Dinawa in Owen Stanley Range). — N. Australia.

## 2. *Diporophora australis* (Steind.).

*Calotella australis*, Steindachner, Novara, Rept. 1869, p. 29, pl. 1, fig. 9.

*Diporophora australis*, Boulenger, Cat. Liz. I 1885, p. 394 (s. syn.).

Differing from the preceding one in having a gular fold. Dorsal scales also varying: equal, keeled scales or longitudinal series of enlarged keeled scales.

Brown or pale olive above, with two series of dark spots along the back; flanks with a brown network; on the head small brown spots; sometimes a large black spot on each side of the neck. Tail with dark transverse rings. Lower parts yellow.

Habitat: New Guinea?!. — N. Australia.

The only indication of this species occurring in the Archipelago, is to be found in Boulenger's Catalogue, where New Guinea and Islands is given as doubtful.

## 16. *Liolepis* Cuvier.

(CUVIER, Règne An. 2nd ed. II p. 37, 1829).

Body depressed, covered with small scales; skin of sides expansible. No crest; no gular sac; a strong transverse gular fold. Tympanum distinct. Tail long, round, a little depressed. Femoral pores present.

Distribution. South-Eastern Asia; Sumatra; Banka.

A single species.

### 1. *Liolepis belliana* (Gray).

*Uromastix belliana*, Gray, Zool. Journ. III 1827, p. 220.

*Liolepis bellii*, Boulenger, Cat. Liz. I 1885, p. 403 (s. syn.); in Annand. & Robins., Fasc. Malay. Zool. I, pl. X, fig. 2.

Snout short, as long as or a little longer than the diameter

of the orbit; nostril large, directed backwards; tympanum large, oval. Head-scales small, strongly keeled; those on the supraorbital region and the occiput granular. On each side a series of chin-shields, parallel with the lower labials; gular scales granular; sides of neck plicate. Body depressed, with a fold along each side; the skin of the flanks expansible. Dorsal scales small, granular, keeled; ventrals larger, smooth. Tail about twice as long as head and body, round, with a depressed base, covered with small, equal, keeled scales, the inferior

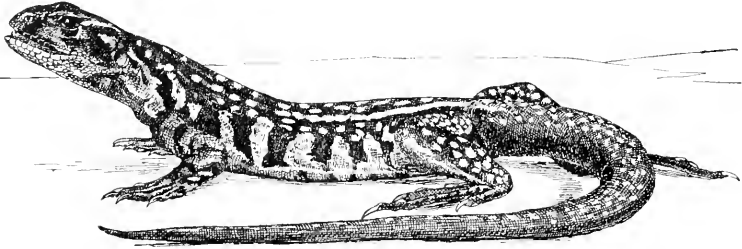


Fig. 60. *Liolepis belliana* (Gray).

largest. Limbs long, the hind limb reaches the neck or the tympanum; digits long and slender, with long claws. Fourteen to twenty-one femoral pores on each side.

Grey, olive, brown or blackish above, with yellow black-edged spots, sometimes confluent into longitudinal bands or forming ocelli; flanks with dark and orange vertical bars. Lower parts yellow or greyish, uniform or variegated with dark or blue. Young specimens black above, with five yellow lines, the median forked on the nape; tail red. Length of head and body 170 mm.; tail 330 mm.

Habitat: Sumatra!; Banka!. — Malacca; Burma; Siam; S. China; S. India.

This lizard lives in pairs in burrows; when angry or frightened it expands its flanks. The Leyden Museum is in possession of two specimens, one from Sumatra, the other from the island of Banka; both places are new localities for this species. The fact, that they are found there, is not very astonishing, as they are recorded from the southern part of the Malay Peninsula, near Sumatra as well as Banka.

## 4. Fam. HELODERMATIDAE.

Body long, tubercular above, covered with flat, imbricate or juxtaposed scales below. Head covered with tubercular scales. Tongue villose, the anterior part smooth, bifid, protractile. Teeth fang-like, with or without grooves. Eye small, with eyelids; ear exposed or hidden. Limbs moderate or short; digits clawed, granular or with transverse shields below. No praeanal or femoral pores. Tail cylindrical, as long as head and body.

Two genera, of which only one inhabits the Indo-Australian Archipelago.

1. *Lanthanotus* Steindachner.

(STEINDACHNER, Denkschr. Ak. Wien XXXVIII p. 95, 1878).

Ear hidden; teeth fang-like, without grooves; no labial shields; lower eyelid with a single, semitransparent shield. No gular fold. Upper surface tubercular, with rows of large tubercles, each of which bearing a horny keeled scale; abdominal scales flat, slightly imbricate. Limbs short, with short, clawed digits, which are granular below.

Distribution. Borneo.

A single species.

1. *Lanthanotus borneensis* Steind.

*Lanthanotus borneensis*, Steindachner, Denkschr. Ak. Wien XXXVIII 1878, p. 95, pl. 1.

*Lanthanotus borneensis*, Boulenger, Cat. Liz. II 1885, p. 302; Proc. Zool. Soc. London 1899, p. 596.

*Lanthanotus borneensis*, Henshaw, Annual Rep. Mus. Comp. Zool. Harv. Coll. 1912/13, p. 7, pl. 1.

Head depressed, oval, with broad, rounded snout, eyes very small, lower eyelid with a semitransparent shield; ears concealed; nostril small, oval, directed obliquely upwards and backwards, nearer the end of the snout than the eye. Head covered with small tubercular scales, enlarged on snout, forehead and temples. Body long; back covered with regular longitudinal rows of large tubercles without ossifications, in six series, each tubercle with a horny keeled scale; rest covered with juxtaposed small flat tubercles. Lower part of head with small scales, increasing towards the neck; a slight

groove on the chin. Ventral scales feebly imbricate, flat, pointed towards the end of the body, passing gradually into

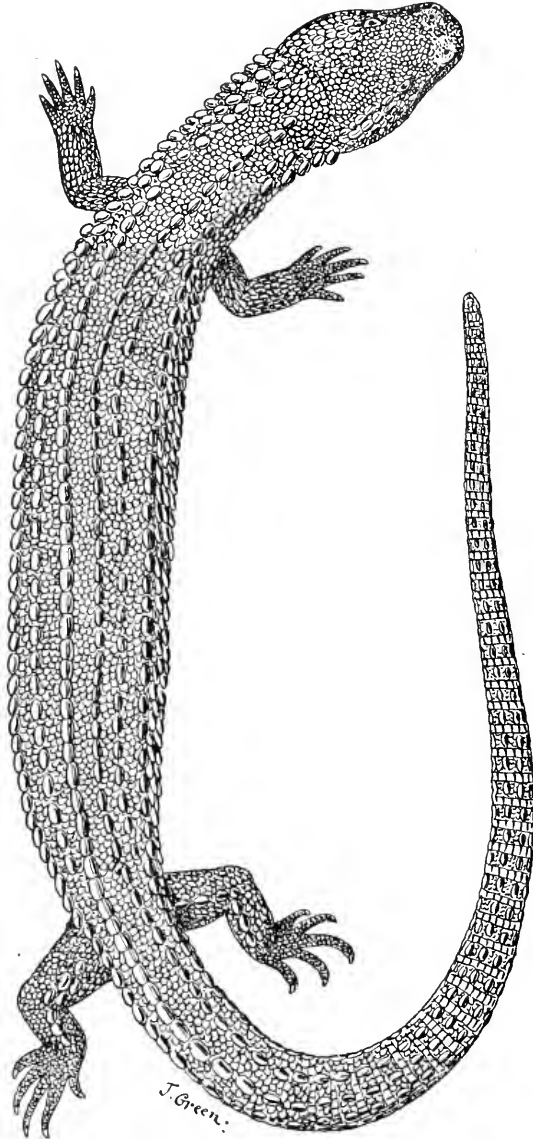


Fig. 61. *Lanthanotus borneensis* Steind.

the tubercles of the sides. Tail round, depressed at the base, tapering, as long as head and body. Lower part of tail with

square scales, forming rows. Limbs short, with short, thick, compressed digits; claws slightly compressed, short.

Reddish-brown above; lower parts yellow with brown marblings; lower part of head brown. Length of head and body 200 mm.; tail 220 mm.; fore limb 30 mm. hind limb 40 mm.

Habitat: Borneo (Rejang river, Sadong!, Sarawak!).

A very rare lizard.

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## 5. Fam. ANGUIDAE.

Body vermiform, covered with squarish imbricate scales, under which are bony plates; these plates have a system of fine tubules, arranged irregularly or forming radiating figures. Head with large symmetrical shields. Tongue composed of two portions, the anterior part thin, bifid, covered with imbricate papillae, retractile into a sheath, formed by a transverse fold, the posterior part thick, bifid, covered with villose papillae; when the tongue is fully extended, no trace of the transverse fold between the two parts is to be seen (fig. 1. ♂); pleurodont. Eye distinct; ear distinct or concealed. Limbs more or less developed, sometimes absent externally. Rudiments of the pectoral and pelvic arches always present. No femoral or preacanal pores. They are terrestrial.

The Indo-Australian Archipelago inhabits only one genus.

### 1. *Ophisaurus* Daudin.

(DAUDIN, Hist. Rept. VII p. 346, 1803).

A lateral fold. Scales squarish-rhomboidal, forming straight longitudinal and transverse series. External limbs absent, or reduced to a rudiment of the hind pair. Teeth with conical or subspherical crowns; pterygoid teeth present.

Distribution. South-Eastern Europe; North Africa; South-Western Asia; Himalayas; Burma; Borneo; Central America.

A single species.

### 1. *Ophisaurus büttikoferi* Lidth.

*Ophisaurus Büttikoferi*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 192.

Lateral teeth conical. Azygos praefrontal three fourths the greatest width of the frontal, as broad as the interparietal and

broader than the suture between the frontal and the interparietal. It is separated from the frontal by two praefrontals. Interparietal twice as broad as the parietals, much broader than the occipital, which is very small. Three shields on a line from the nasal to the azygos praefrontal; five supraoculars. Ear-opening distinct, not larger than the nostril. Dorsal plates in 16 longitudinal and 105 transverse series; 12 of these longitudinal series keeled, the keels forming unbroken straight lines, the other four series smooth; the outer series partially covered by the lateral fold. Ventrals smooth, in 10 longitudinal series. No external limbs. Tail thrice as long as head and

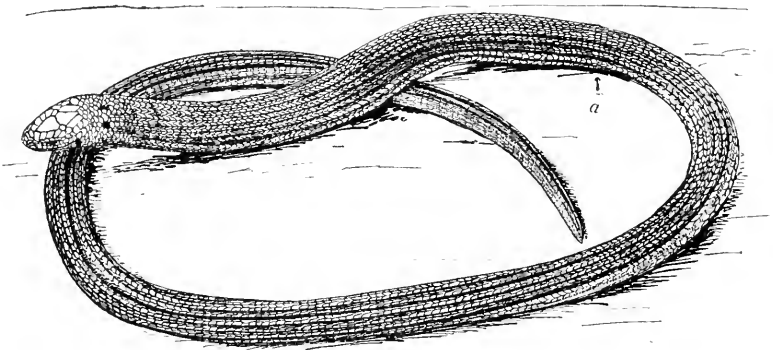


Fig. 62. *Ophisaurus büttikoferi* Lidth. a. Anal opening.

body, upper and lower caudal scales strongly keeled, the keels forming straight lines.

Brown above; a dark lateral band edged above with a light band; this lateral band is continued on the tail. A small blue spot on the interparietal, indicating the situation of the parietal-eye. On the anterior part of the back irregular transverse series of bluish spots, anteriorly edged with black. Lips and lower parts pale yellowish; five oblique dark lines on the sides of the head, running across the lips, the first behind the nostril, the second below the eye, the third at the corner of the mouth, the fourth below the ear-opening and the fifth at the nape; the latter is continued on each side of the belly. Length of head and body 125 mm.; tail 375 mm..

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Mt. Liang Kubung!).



## 6. Fam. VARANIDAE.

Body strong, covered with roundish granular scales above, which are in the middle of rings of small granules; below with squarish scales arranged in transverse rows; often a strong fold of the skin on each side of the neck and body. Head covered with small polygonal scales. Tongue long and slender, smooth, deeply bifid, retractile into a sheath at the base, like that of snakes (fig. 1. *A*). Teeth large, dilated at the base, which is fixed to the inner side of the jaw; no teeth on the palate. Eye with round pupil and distinct eyelids; ear distinct; neck long. Limbs very strong; tail long, cylindrical or compressed. Praeanal pores sometimes present.

Large lizards, carnivorous, terrestrial or aquatic. The eggs are oval, with a soft shell.

A single genus.

Nom. indig. Biawak, Minjawak (mal.); Buaja darat (Timor, Flores); Soa Soa (Moluccas).

1. *Varanus* Merrem.

(MERREM, Tent. Syst. Amph. p. 58, 1820).

For characters see those of the family.

Distribution. Africa; S. Asia; Australia.

## Key to the Indo-Australian species.

*A.* Nostril an oblique slit; tail compressed.

I. Ventral scales keeled.

*a.* Supraocular scales slightly enlarged transversely; nostril much nearer the orbit than the end of the snout.

1. Dorsal scales very unequal . . . . . 1. *V. heteropholis* p. 142.

2. Dorsal scales equal.

† Snout moderate; dorsal scales large; nuchal scales not keeled . . . . . 2. *V. dumerili* p. 143.

†† Snout very long, pointed; dorsal scales small; nuchal scales very large and strongly keeled. . . . . 3. *V. rudicollis* p. 144.

*b.* Supraocular scales irregular; nostril much nearer the end of the snout than the orbit. . . . . 4. *V. salvadorii* p. 145.

- II. Ventral scales smooth; supraocular scales transversely enlarged; nostril two times nearer the orbit than the end of the snout. . . . . 5. *V. nebulosus* p. 145.
- B. Nostril round or oval; tail compressed.
- I. A transversely enlarged median series of supraocular scales.
- a. Nostril oval, at least twice as far from the orbit as from the end of the snout.
1. Scales rather small; ventral scales in 85—95 transverse rows; supraocular region with 4—8 transversely enlarged shields. . . . . 6. *V. salvator* p. 146.
2. Scales rather large; ventral scales in 74 transverse rows; supraocular region with 4—6 broad, transversely enlarged shields. . . . . 7. *V. togianus* p. 147.
- b. Nostril round.
1. Nostril two times nearer the end of the snout than the orbit; nuchal scales very small, separated by wide interspaces. . . . . 8. *V. kalabeck* p. 148.
2. Nostril a little nearer the end of the snout than the orbit . . . . . 9. *V. indicus* p. 148.
- II. Supraocular scales subequal.
1. Nostril a little nearer the end of the snout than the orbit. . . . . 10. *V. gouldi* p. 149.
2. Nostril three times as far from the orbit as from the end of the snout. . . . . 11. *V. komodoensis* p. 150.
- C. Nostril round; tail round or slightly compressed posteriorly, without a crest.
- I. A transversely enlarged median series of supraocular scales.
- a. Nuchal scales not keeled . . . . . 12. *V. prasinus* p. 151.
- b. Nuchal scales strongly keeled. . . . . 13. *V. kordensis* p. 152.
- II. Supraocular scales subequal; nostril equally distant from the orbit and the end of the snout. . . . . 14. *V. timorensis* p. 152.

### 1. *Varanus heteropholis* Boulenger.

*Varanus heteropholis*, Boulenger, Proc. Zool. Soc. London 1892, p. 506.

Snout depressed, obtusely pointed, as long as the distance between the anterior corner of the eye and the ear; canthus rostralis indistinct; nostril oblique, three times nearer the orbit than the tip of the snout; teeth sharp, compressed. Head-scales large, subequal, polygonal, ten between the nostrils, four across the supraocular region and three between the

orbits; middle supraocular scales a little enlarged; temporals very small. Nuchal scales very large, round and flat, generally with a short, feeble keel, widely separated from one another by fine granules. Body covered above with very unequal, feebly keeled scales, those on the vertebral line smallest; two or three alternating series of large oval scales on each side of the middle line and a series of enlarged scales on each side of the body. Ventral scales keeled <sup>1)</sup>, in about 80 transverse series. Tail compressed, nearly one time and a half as long as head and body, covered with keeled scales of which the lower are twice as large as the upper; a very low, doubly toothed crest above. Limbs strong; digits long.

Dark brown above; a black streak on each side of the nape anteriorly; two crescentic transverse bands on the nape and a third on the back between the fore limbs. Lower parts reddish-brown; throat variegated with black. Length of head and body 430 mm.; tail 610 mm.

Type-specimen examined in the British Museum.

Habitat: Borneo (Mt. Dulit! and Baram, Sarawak).

## 2. *Varanus dumerili* (Schleg.).

*Monitor Dumerilii*, Schlegel, Abbild. 1844, p. 78.

*Varanus dumerilii*, Boulenger, Cat. Liz. II 1885, p. 312 (s. syn).

Snout depressed at the tip, a little longer than the distance between the anterior border of the eye and the ear; canthus rostralis indistinct; nostril oblique, about two times nearer the orbit than the tip of the snout; teeth sharp, compressed. Head-scales not very large, subequal; scales in the middle of the supraocular region a little enlarged transversely. Nuchal scales very large, almost as long as broad, flat, only the posterior keeled. Body covered with large, oval, keeled scales. Ventral scales with a slight keel, in 75 to 85 transverse series. Tail strongly compressed, covered with keeled scales, sometimes enlarged on the sides; a very low doubly toothed crest above. Limbs strong; digits moderate.

Light brown or olive-brown above, with broad dark transverse bands, broader than the interspaces; a dark temporal

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1) Brown (Proc. Acad. Philad. LIV 1902, p. 177) describes a specimen with smooth ventral scales.

streak, usually confluent with an U-shaped dark band on the neck; lips with dark vertical bars; limbs dark with yellow spots. Lower parts yellowish, uniform or with dark transverse bands. Head and neck of young specimens yellow with black markings, back and tail black with yellow transverse bands (when alive vermilion). Length of head and body 370 mm.; total length reaches 1 M. or more.

Type-specimen examined in the Leyden Museum.

*Habitat*: Batu Islands!; Sumatra! (Stabat, Deli, Serdang!, Taluk!, Indragiri); Banka!; Biliton; Java (Tengger Mts. 1200 M.); Borneo! (Singkawang, Sarawak, Baram, Kuching, Pangkalan ampat, Buntal, Mt. Dulit, 1000 feet, Rejang river, Akar river, Bongon, Nanga Raun, Howong river, Tandjong). — Malacca; Tenasserim.

### 3. *Varanus rudicollis* (Gray).

*Varanus rudicollis*, Gray, Cat. 1845, p. 10.

*Varanus rudicollis*, Boulenger, Cat. Liz. II 1885, p. 313.

Snout long and pointed, more than half the length of the head; canthus rostralis swollen; nostril oblique, more than two times nearer the orbit than the tip of the snout; teeth sharp, compressed. Head-scales not very large, subequal; a series of three to six transversely enlarged scales on the supraocular region. Nuchal scales very large, with strong keels, in ten to twelve longitudinal series. Body covered with small, strongly keeled scales. Ventral scales keeled, in 85 transverse series. Tail compressed, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong; digits long.

Blackish above; neck yellowish, with three black longitudinal streaks; anterior part of back yellowish with two broad black transverse bands; body posteriorly and flanks with yellow ocelli; limbs with small yellow spots; tail with broad black and narrow yellow transverse bands. Lower parts reticulated with black. Length of head and body 440 mm.; total length 1 M.—1.20 M.

*Habitat*: Sumatra (Benakat in Palembang, Indragiri); Borneo (Matang, Kuching, Pangkalan Ampat, Sarawak, Baram river, Rejang river, Mt. Dulit, 2000 feet, Bongon, Samarinda!). — Malacca; Philippines.

Found in jungle, on trees.

#### 4. *Varanus salvadorii* (Peters & Doria).

*Monitor Salvadorii*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 337, pl. II, fig. 1 & 2.

*Varanus salvadorii*, Boulenger, Cat. Liz. II 1885, p. 314.

Snout rounded, a little longer than the distance between the anterior corner of the eye and the ear; canthus rostralis rounded, swollen; nostril oblique, near the tip of the snout; teeth sharp, compressed. Head-scales small, those on the snout and interorbital region largest; supraocular scales irregular. Nuchal scales small, round, the anterior not keeled. Body covered with small, oval, keeled scales. Ventral scales much larger, strongly keeled, in about 80 transverse series. Tail rounded at the base, compressed for the greater part, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong; digits long.

Black above, spotted with yellow, the spots often forming ocelli and disposed in transverse series on the back; head and neck dotted with yellow; tail with irregular broad and narrow yellow bands. Lower parts yellowish with irregular black bands and markings. Length of head and body 500 mm.; tail 1150 mm.

Habitat: New Guinea (Dorei, Kwawi!, Lake Sentani!, Jamur river!, Stekwa river, 1800 feet, Dinawa in Owen Stanley Range, St. Joseph river).

#### 5. *Varanus nebulosus* (Gray).

*Monitor nebulosus*, Gray, Griff. Anim. Kingd. IX, Syn. 1831, p. 27.

*Varanus nebulosus*, Boulenger, Cat. Liz. II 1885, p. 311 (s. syn.).

Snout pointed, convex, as long as the distance between the anterior corner of the eye and the posterior border of the ear; canthus rostralis distinct; nostril oblique, two times nearer the orbit than the tip of the snout; ear-opening oblique; teeth sharp, compressed. Head-scales small, subequal; supraocular region with four to seven transversely enlarged scales. Body covered above with small, oval, keeled scales; those on the neck anteriorly larger, smooth, roundish. Ventral scales smooth, in about 80 transverse series. Tail compressed, nearly one time and three fourths the length of head and body, covered with keeled scales; a very low doubly toothed crest above. Limbs strong; digits moderate.

Olive-green or brownish above, marbled and dotted with dark and light. Chin and throat with transverse dark bands or marbled with blackish. Young specimens with yellowish ocelli on back, limbs and base of tail; two chevron-shaped black bands on the nape, directed posteriorly, the anterior beginning at the eye; lower parts marbled with dark. Length of head and body 350 mm.; tail 600 mm.

Habitat: Java (Krawang). — Malacca; Singapore; Penang; Siam; Burma; Bengal.

Found on river-banks.

### 6. *Varanus salvator* (Laur.).

*Stellio salvator*, Laurenti, Syn. Rept. 1768, p. 56.

*Varanus salvator*, Boulenger, Cat. Liz. II 1885, p. 314 (s. syn.).

Snout depressed at the end, about half as long as the head; canthus rostralis rounded; nostril oval, at least two times nearer

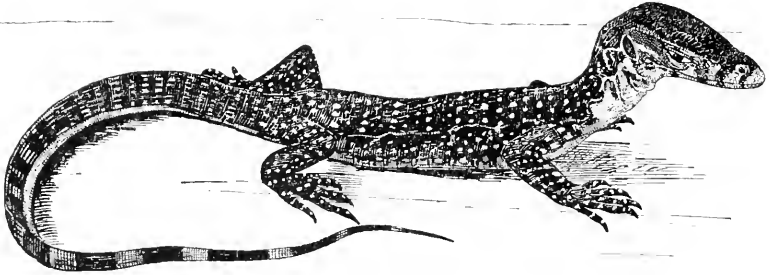


Fig. 63. *Varanus salvator* Laur. Young specimen  $\times \frac{1}{2}$ .

the tip of the snout than the orbit; teeth sharp, compressed. Head-scales not very large, the temporal ones smallest; a series of four to eight transversely enlarged scales on the supraocular region. Nuchal scales small, oval, keeled. Body covered with small, oval, keeled scales. Ventral scales keeled, in 85—95 transverse series. Tail strongly compressed, about one time and one fourth the length of head and body, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong; digits moderate.

Dark brown or blackish above, with yellow spots or ocelli in transverse rows; snout lighter, with black transverse bands, passing across the lips and chin; a black temporal band, beginning at the eye and bordered by a yellow streak, which may extend along the side of the neck. Lower parts yellow. Young

specimens show the black and yellow markings beautifully. Length of head and body 1040 mm.; tail 1320 mm.

*Habitat*: Simalur!; Nias!; Engano; Sumatra (Sabang on Pulu Weh!, Deli!, Langkat, Labuan, Siboga, Taluk!, Kaju tanam!, Solok!, Singkarah!, Gunung Sugei near Padang, 1500—3000 feet, Indragiri, Djambi!, Tandjung Laut, Musi, Lematang, Benugal, Lakitan, Semangus, Rawas, Rupit, Batang Leko, Dawas, Tunkal, Bantung in Palembang); Java (Buitenzorg!, Samarang, Parugan!, Tengger Mts. 1200 M., Mount Smeru!); Bali; Lombok; Sumbawa; Sumba!; Flores!; Kalao Island; Wetar; Borneo! (Sebruang Valley, Pontianak, Smitau, Sarawak, Sadong, Baram, Kuching, Santubong, Mt. Dulit, Rejang and Kapuas rivers, Singkawang, Labuan, Martapura); Celebes! (Manado!, Gorontalo!, Posso, Kema, Kandari); Halmahera!; Batjan. — Malacca; Andamans; Nicobars; S. China; Siam; Tenasserim; Nepal; Ceylon; Philippines; Cape York.

Found in swamps or on trees near rivers. The eggs are laid in hollow tree-trunks or in burrows. A very common species.

#### 7. *Varanus togianus* (Peters).

*Monitor (Hydrosaurus) togianus*, Peters, Mon. Berl. Ac. 1872, p. 582.

*Varanus togianus*, Boulenger, Cat. Liz. II 1885, p. 316.

Snout depressed at the tip, the distance between the tip and the anterior corner of the eye equals that between the latter point and the ear; canthus rostralis rounded; nostril oval, two times nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales rather large, those on the temples smallest; a series of 4—6 broad, transversely enlarged scales on the supraocular region. Nuchal scales larger than dorsals, flat, smooth, separated from each other. Body covered with moderate, oval, keeled scales. Ventral scales keeled, in 74 transverse series. Tail strongly compressed, more than one time and a half the length of head and body, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong, digits moderate.

Dark brown or black above, dotted with yellow, no transverse bands; head lighter, a yellow temporal streak, bordered above with black. Lower parts yellow, throat and anterior part of belly with transverse black bands. Young specimens with

numerous orange dots on body, limbs and tail; a broad orange streak from the eye through the ear along the neck, continued on the sides of the body and base of tail by a series of round orange spots; black transverse bars on the snout and lips, continued on the chin. Lower parts orange, with black transverse bars. Length of head and body 410 mm.; tail 630 mm.

Habitat: Togian Islands; Celebes (Macassar!, Tello!, Bay of Tomini); Saleyer!.

### 8. *Varanus kalabeck* (Less.).

*Monitor kalabeck*, Lesson, Voy. Coquille, Zool. II 1830, p. 52.

*Monitor kalabeck*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 332, pl. I, fig. 3.

*Varanus kalabeck*, Boulenger, Cat. Liz. II 1885, p. 316.

Snout obtusely pointed, depressed at the tip, longer than the distance between the anterior corner of the eye and the ear; nostril round, two times nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales rather small, the temporal scales smallest; a series of five or six transversely enlarged scales on the supraocular region. Nuchal scales very small, round, flat and widely separated from one another. Body covered with small, keeled scales. Ventral scales small, smooth, in 73 transverse series. Tail compressed, one time and two thirds the length of head and body, a low crest above. Limbs strong; digits long.

Brown above, with numerous yellow dots, covering 1—4 scales; head almost uniform; tail reticulated with blackish. Lower parts yellowish, with brown transverse bands. Length of head and body 450 mm.; tail 750 mm. (Not seen by me).

Habitat: Waigeu; New Guinea.

### 9. *Varanus indicus* (Daud.).

*Tupinambis indicus*, Daudin, Rept. III 1802, p. 46, pl. XXX.

*Varanus indicus*, Boulenger, Cat. Liz. II 1885, p. 316 (s. syn.).

Snout depressed at the end, the distance from the tip to the anterior corner of the eye equals that between the latter point and the anterior border of the ear; canthus rostralis rounded; nostril round, a little nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales large, those on the snout larger than temporal ones; a series of four



to six transversely enlarged scales on the supraocular region. Nuchal scales larger than in the preceding species. Body covered with small, oval, keeled scales. Ventral scales smooth, in 90—110 transverse series. Tail strongly compressed, not quite one time and two thirds the length of head and body, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong; digits long.

Olive-brown or black above, dotted with yellow. Lower parts uniformly yellow. Young specimens have large yellow spots or ocelli; a black reticulation below. Length of head and body 530 mm.; tail 820 mm.

Habitat: Sumatra<sup>1</sup>); Celebes; Timor Laut; Aru Islands; Kei Islands!; Goram; Ceram; Ambon!; Buru; Batjan; Ternate; Halmahera!; Salibabu Islands!; Gebe; Waigeu!; Rawak Island N. off Waigeu; New Guinea (Pulu Faor, Ron, Jobi, Mafoor, Yule, Sorong, Dorei, Passim, Rubi, Humboldt Bay!, Lake Sentani!, Mawes!, Wendesi!, Sermowai river!, Mouth of the Tami, Germania Bay, Mimika river, Stekwa river, Lorentz river!, Bogadjim, Stephansort, Bongu, Astrolabe Bay, Bukaua, Aroma, Bara Bara, Gerekanumu, Fife Bay, Thaitoro Bay); Schouten Islands (Mysore). — Ferguson Island; Trobiand Island; Admiralty Islands; Bismarck Archipelago; Solomon Islands; Islands of Torres Straits; Cape York; Caroline, Marian and Marshall Islands.

#### 10. *Varanus gouldi* (Gray).

*Hydro:aurus gouldii*, Gray, Ann. Nat. Hist. I 1838, p. 394.

*Varanus gouldii*, Boulenger, Cat. Liz. II 1885, p. 320.

Snout long, tip depressed; the distance from the tip to the eye equals that between the anterior border of the eye and the ear anteriorly; canthus rostralis sharp; nostril round, nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales very small, subequal; no series of enlarged scales on the supraocular region. Body covered above with small, oval, keeled scales. Ventral scales smooth, in 125—140 transverse series. Tail compressed, about one time and one third the length of head and body, covered with keeled scales; a very low, doubly toothed crest above. Limbs strong; digits moderate.

Brown above, with round yellow spots or ocelli on back,

1) Werner, Zool. Jahrb. Syst. XXVIII 1910, p. 286.

limbs and tail; sometimes dark brown transverse bands on the body and several on the tail; a dark band from the eye along the neck, passing above the ear and bordered above and below by a yellow streak; another dark band on the upper lip, passing through the ear and continued along the side of the neck, where it may form spots; sides of neck with irregular black spots. Lower parts yellowish, uniform or with small dark spots. Young specimens have the dark and light markings more strongly indicated. Length of head and body 550 mm.; tail 750 mm.

*Habitat*: New Guinea (Mac Cluer Bay, Yule Island, Aroma, Hula!, Gerekanumu). — Thursday Island; Australia.

#### 11. *Varanus komodoensis* Ouwens.

*Varanus komodoensis*, Ouwens, Bull. Jardin Botan. Buitenzorg (2) VI 1912, p. 1, pl. 1-3.

Snout broad, rounded, depressed, the distance from the tip to the anterior corner of the orbit equals that between the

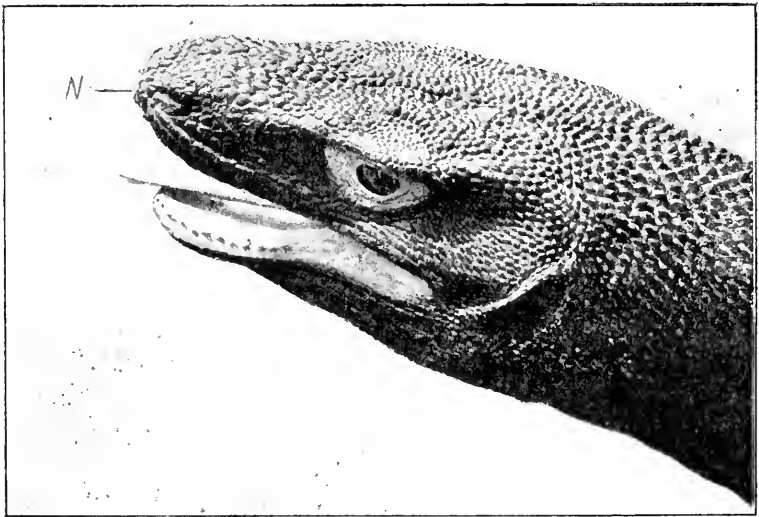


Fig. 64. *Varanus komodoensis* Ouwens. (After Ouwens). N. Nostril.

latter point and the ear; canthus rostralis rounded; nostril large, oval, very near the tip of the snout; teeth sharp, compressed. Head-scales large, roundish, those on the snout largest and elongate, the temporal ones smallest; supraocular

scales small, almost equal. Neck long; nuchal scales large, conical, about as large as those on the snout, separated from one another. Back covered with somewhat smaller keeled scales, larger than those of the flanks; a strong fold along each side of the neck and between axilla and groin. Ventral scales feebly keeled, a little smaller than the dorsals, separated by granular interspaces, in 80—97 transverse series. Tail compressed, almost as long as the body, covered with keeled scales, the lower scales largest; a very low doubly toothed crest above. Limbs strong, but rather short; digits strong with very strong claws; scales of limbs large, especially those on the anterior part of the fore limb.

Dark brown above; tongue yellow. Total length reaches 7 M. Nom. indig. Buaja darat (= land crocodile).

Habitat: Komodo Island; Flores! (Labuan Badjo).

According to the discoverers, this species lives exclusively on land, where it makes holes under stones, in which it remains at night. The animals can move with great rapidity, not touching the ground with their bodies.

Note: In the Leyden Museum I examined a skin and skull of this large *Varanus*, (the skin measuring 2.66 M.) which were received there some time ago. As the skin was in a very good condition, it was stuffed, distinctly showing the peculiarities of the scales. Having no other specimen preserved in spirit for comparison, some details of the outer form are doubtful; so it is uncertain, whether the caudal keel begins at the base of the tail or at a short distance from there, and whether the base of the tail is compressed or rounded. As soon as another specimen has been purchased, Dr. van Lidth de Jeude will give a full description of this remarkable species.

## 12. *Varanus prasinus* (Schleg.).

*Monitor prasinus*, Schlegel, Abbild. 1844, p. 78, pl. XXII, fig. 5.

*Varanus prasinus*, Boulenger, Cat. Liz. II 1885, p. 321.

Snout depressed at the end, as long as the distance between the anterior border of the orbit and the ear; canthus rostralis indistinct; nostril round or oval, slightly nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales large, flat, largest between the orbits; a series of three or four transversely enlarged scales on the supraocular region. Nuchal scales smooth. Body covered with large, oval scales,

keeled on the hinder part of the back. Ventral scales keeled, in 77—90 transverse series. Tail round, compressed at the end, without a keel, one time and three fourths the length of head and body, covered with keeled scales. Limbs strong; digits long.

Bright green above, with a black network or black transverse bands. Lower parts uniformly yellowish. Length of head and body 248 mm.; tail 440 mm.

Habitat: New Guinea (Jobi, Lobo, Dorei, Mansinam, Humboldt Bay!, Lake Sentani! Wendèsi!, Mimika river, Paup, Stephansort, Bogadjim, Bongu, Astrolabe Bay!, Aroma, Moroka 2300 feet, Gerekanumu, Dinawa, St. Joseph river). — Islands of Torres Straits.

### 13. *Varanus kordensis* (Meyer).

*Monitor kordensis*, Meyer, Mon. Berl. Ac. 1874, p. 131.

*Monitor beccarii*, Doria, Ann. Mus. Genova VI 1874, p. 331, pl. XI, fig. a.

*Varanus kordensis*, Boulenger, Cat. Liz. II 1885, p. 322.

Snout depressed, as long as the distance between the anterior border of the orbit and the ear; canthus rostralis rounded; nostril round, slightly nearer the tip of the snout than the orbit; teeth sharp, compressed. Head-scales large, flat, largest between the orbits; a series of three to five transversely enlarged supraocular scales. Nuchal scales small, long and strongly keeled. Body covered with elongate, keeled scales. Ventral scales keeled, in about 66 transverse series. Tail round, compressed at the end, without a keel, covered with keeled scales, about two times and one third the length of head and body. Limbs strong; digits long.

Olive above with a black network or black above, with or without olive-green transverse bands, formed by green ocelli; head olive. Lower parts olive. Length of head and body 230 mm.; tail 520 mm.

Habitat: New Guinea (Fak Fak, S. of Huon Gulf, Kordo on Mysore); Aru Islands!. — St. Aignan; Ferguson and Trobriand Islands.

### 14. *Varanus timorensis* (Gray).

*Monitor timorensis*, Gray, Griff. An. Kingd. IX Syn. 1831, p. 26.

*Varanus timorensis*, Boulenger, Cat. Liz. II 1885, p. 323.

Snout depressed at the tip, not quite so long as the distance

between the anterior border of the eye and the ear; nostril round, in the middle between the tip of the snout and the orbit; teeth sharp, compressed. Head-scales small, those on the supraocular and temporal regions smallest. Body covered with small, oval, feebly keeled scales. Ventral scales smooth, in 65—75 transverse series. Tail round, about one time and one third the length of head and body, without a keel, covered with keeled scales. Limbs and digits strong.

Olive, yellowish or blackish above, with a black network or spotted with yellow; a black streak on the temples; tail with black transverse bands. Lower parts lighter; throat dotted with black. Length of head and body 250 mm.; tail 340 mm.

Habitat: Savu; Rotti; Samao!; Timor!; Batjan? <sup>1)</sup>. — Islands of Torres Straits; N. Australia.

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#### 7. Fam. LACERTIDAE.

Body long and slender, covered with juxtaposed or imbricate scales. Ventral scales large, in longitudinal and transverse series, different from the lateral scales. Head with large symmetrical shields. Tongue flat, bifid at both ends, with imbricate papillae or oblique plicae (fig. 1.5); pleurodont. Eye with round pupil and well developed eyelids; ear distinct. Limbs well developed, pentadactyle. Femoral or inguinal pores often present. Tail long, fragile. Most of them are terrestrial; oviparous or viviparous; the eggs have a parchment-like shell.

One genus reaches as far eastwards as the Indo-Australian Archipelago.

#### 1. *Tachydromus* Daudin.

(DAUDIN, Hist. Rept. III p. 251, 1802).

Head-shields consisting of: a frontonasal, a pair of prefrontals, a frontal, a pair of frontoparietals, a pair of parietals, an interparietal and an occipital. Nostril bordered by two nasals and the first labial. Lower eyelid scaly. Collar more or less distinct. Back covered with large, rhomboidal, keeled shields, forming longitudinal series; flanks granular; ventral shields rhomboidal, imbricate, all keeled or partly so. Digits sub-cylindrical, compressed, with smooth, tubercular lamellae below,

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<sup>1)</sup> See Werner, Zool. Jahrb. Syst. XXVIII 1910, p. 286.

the distal lamellae much enlarged. Inguinal pores; no femoral pores. Tail extremely long, cylindrical.

Distribution. Eastern Asia; Japan; Western part of the Indo-Australian Archipelago.

A single species.

1. *Tachydromus sexlineatus* Daud.

*Tachydromus sexlineatus*, Daudin, Hist. Rept. III 1802, p. 256, pl. XXXIX.

*Tachydromus sexlineatus*, Boulenger, Cat. Liz. III 1887, p. 4 (s. syn.).

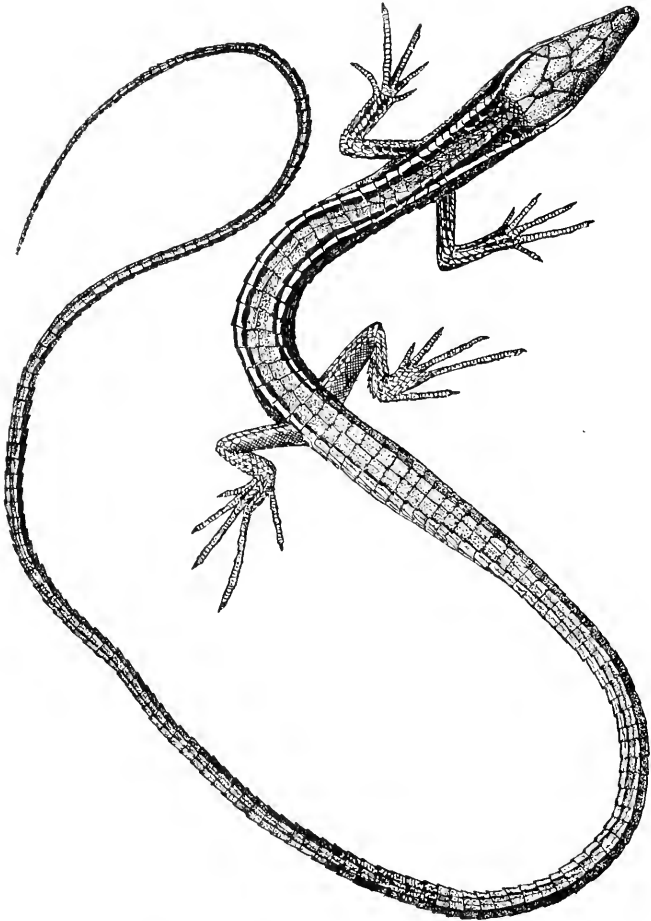


Fig. 65. *Tachydromus sexlineatus* Daud.

Head obtusely pointed; rostral pentagonal; nostril bordered by two nasals and the first labial; loreals two. Supraoculars

in contact with the supraciliaries; the large anterior one in contact with the loreal; temporal scales keeled. Seven upper and five lower labials; mental much larger than the latter; on each side along the throat three large shields, the anterior two pair forming a suture; collar distinct (fig. 66). Body elongate; six or eight longitudinal series of strongly keeled shields on the nape, four on the back, median pair largest. Ventral shields in 10 or 12 longitudinal series, strongly keeled. One to six inguinal pores on each side; median praeanal scale very large. Tail cylindrical, very long, covered with strongly keeled scales, the keels forming longitudinal series. Limbs long; digits long and slender, compressed, with smooth, tubercular lamellae below, the distal one enlarged.

Greenish or greyish-brown above, with metallic gloss; a more or less distinct whitish, black-edged streak from the supraciliary edge along each side of the back to the base of the tail; the black band bordering the light streak beneath, begins on the loreal region and passes through the eye and above the tympanum; sometimes the black band is represented by two narrow black lines; sides often with small light-greenish spots. Lower parts yellowish or greenish. Length of head and body 61 mm.; tail 285 mm.

Nom. indig. Bengkarong ular.

Habitat: Sumatra (Atjeh, Tandjong, Indragiri, Tandjung Laut, Palembang!, Bunga Maas, Padang, Gunung Sahilan!); Banka; Java (Buitenzorg!, Sukabumi!, Tengger Mts., 1200 M.); Borneo (Matang, Sarawak, Kuching, Sintang, Singkawang, Pontianak, Bandjermassin, Mt. Kenepai, Sebruang Vally); Natuna Islands (1000 feet). — Malacca; Burma; Eastern Himalayas; Assam; Indo-China; Southern China.

Lives in high grass.

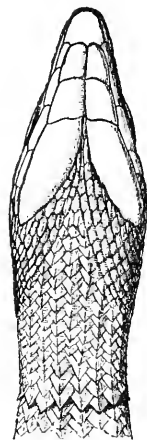


Fig. 66. *Tachydromus sextineatus* Daud. Throat with collar  $\times 2\frac{1}{2}$ .

## 8. Fam. SCINCIDAE.

Body covered with uniform cycloid, imbricate scales with underlying bony plates; these plates with symmetrical tubules. Head with large symmetrical shields. Tongue flat, bifid behind, nicked in front, covered with rhomboidal imbricate papillae (fig. 1. *♂*); pleurodont. Eye with round pupil, eyelids usually well-developed. Ear distinct or covered with scales. Limbs present or absent. No femoral or preanal pores. Tail generally long, fragile. Terrestrial and arboreal forms, usually ovoviviparous; the eggs, when laid, are soft-shelled.

## Key to the Indo-Australian genera.

- A.* Tympanum, when distinct, more or less sunk.
- I. Pterygoids separated in the middle line of the palate, the palatal notch extending anteriorly to a line connecting the centre of the eyes (fig. 67 *a*).
    - a.* No supranasals . . . . . 1. *Tiliqua*, p. 156.
    - b.* Supranasals present . . . . . 2. *Mabuia*, p. 158.
  - II. Pterygoids in contact in front, the palatal notch not extending to between the centre of the eyes (fig. 67 *b*).
    1. Eyelids movable . . . . . 3. *Lygosoma*, p. 164.
    2. Eyelid immovable, transparent, covering the eye . . . . . 4. *Ablepharus*, p. 271.
- B.* Tympanum exposed and superficial.
- I. Head normal . . . . . 5. *Tropidophorus*, p. 275.
  - II. Head well separated from the neck, covered with bony shields . . . . . 6. *Tribolonotus*, p. 280.



Fig. 67. *a.* Palate of *Mabuia multifasciata* (Kuhl);  
*b.* of *Lygosoma olivaceum* (Gray).  
 Nat. size.

1. *Tiliqua* Gray.

(GRAY, Ann. Phil. (2) X p. 201, 1825).

Palatines in contact in the middle of the palate; pterygoids



separated in the middle, the palatal notch extending anteriorly to a line connecting the centre of the eyes (fig. 67a); pterygoids without teeth. Eyelids distinct, scaly; tympanum distinct, deeply sunk. Nostril in the nasal, with a groove behind; no supranasals; a series of shields between the eye and the labials; praefrontal well developed; frontoparietals and interparietal distinct. Limbs short, pentadactyle; digits roundish or slightly compressed, with undivided lamellae below.

Distribution. Indo-Australian Archipelago; Australia.

A single species.

### 1. *Tiliqua gigas* (Schn.).

*Scincus gigas*, Schneider, Hist. Amph. II 1801, p. 22.

*Tiliqua gigas*, Boulenger, Cat. Liz. III 1887, p. 144 (s. syn.).

Eyelids distinct, scaly; ear-opening about as large as the eye-opening, with two or three large, obtuse lobules anteriorly.

Nostril in the nasal; no supranasals; frontonasal in contact with the rostral; praefrontals forming a suture; frontal more long than broad, as long as the parietals, in contact with the two anterior supraoculars; four supraoculars, second largest; six to seven supraciliaries; frontoparietals distinct; interparietal as broad as the parietals or narrower;

usually three anterior temporals, larger than the others; parietals separated. Body stout, with 28—32 subequal scales round the middle, dorsals usually keeled. Tail about as long as the body, compressed; scales of the upper part keeled. Limbs short, fore limb a little longer than the head, its length is contained

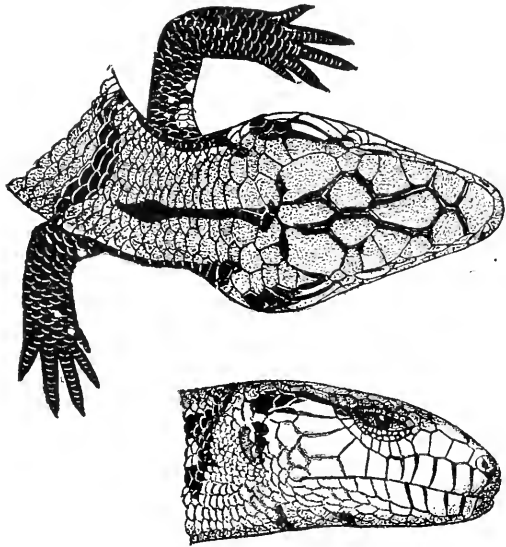


Fig. 68. *Tiliqua gigas* (Schn.).

nearly two times and a half in that between axilla and groin; digits short, round, with undivided lamellae below.

Light brown above, with eight to ten dark brown cross bands; flanks and limbs dark brown, spotted with yellow; head-shields edged with brown; a dark brown median line on the nape; tail banded. Lower parts brown and yellow. Length of head and body 312 mm.; tail 245 mm.

**Habitat:** Sumatra<sup>1)</sup>; Java (Buitenzorg, Bantam); Ambon; Ceram; Misol; Ternate!; Halmahera; Kei Islands; Aru Islands; New Guinea (Fak Fak, Jobi, Sorong, Mansinam Adoré, Wendési!, Lorentz river!, Sepik river, Bongu, Erima, Astrolabe Bay!, Sattelberg, Lialun, Hula, Kapa Kapa, Bara Bara, Haveri, Dinawa, St. Joseph river). — Ferguson Island.

#### Var. *keiensis* Oud.

*Tiliqua gigas* var. *keiensis*, Oudemans, in Semon's Zool. Fors. Austr. 1894, p. 135.  
*Tiliqua gigas* var. *keiensis*, Roux, Abh. Senck. Ges. XXXIII 1910, p. 236.

This form differs from *T. gigas* in having the fore limb as long as the head or shorter; its length is contained three or four times in that between axilla and groin; 31—34 scales round the body; usually four large anterior temporals.

Greyish-brown above, speckled with black, with seven to nine transverse dark brown bands, which are black-spotted; a median dark line on the nape; flanks blackish, spotted with light grey. Length of head and body 297 mm.; tail 280 mm.

Type-specimen of the variety examined in the Amsterdam Museum.

**Habitat:** Kei Islands!.

## 2. *Mabuia* Fitz.

(FITZINGER, N. Classif. Rept. p. 23, 1826).

Palatines in contact in the middle; pterygoids separated, the palatal notch extending anteriorly to a line connecting the centre of the eyes (fig. 67a); pterygoids without or with small teeth. Eyelids movable, lower eyelid scaly or with a transparent disk; tympanum distinct, sunk. Nostril in the nasal; supranasals present; frontoparietal present; interparietal single, double or fused with the parietals. Limbs strong, penta-

1) Werner, Zool. Jahrb. Syst. XXVIII 1910, p. 286.

tle; digits roundish or compressed, with transverse lamellae below.

Distribution. S. Asia; Central and S. America; West Indies; Africa and Madagascar.

### Key to the Indo-Australian species.

A. Parietals forming a suture; postnasal present 1. *M. quinquecarinata* p. 159.

B. Parietals entirely separated.

I. No postnasal.

a. 26 scales round the body; frontonasal more broad than long . . . . . 2. *M. rugifera* p. 160.

b. 28—30 scales round the body; frontonasal as long as broad . . . . . 3. *M. multicarinata* p. 161.

II. Postnasal present.

1. 30—36 scales round the body; the hind limb reaches the axilla or beyond; subdigital lamellae keeled . . . . . 4. *M. rudis* p. 161.

2. 30—34 scales round the body; the hind limb does not reach the axilla; subdigital lamellae smooth. . . . . 5. *M. multifasciata* p. 162.

#### 1. *Mabuia quinquecarinata* Werner.

*Mabuia quinquecarinata*, Werner, Verh. Ges. Wien XLVI 1896, p. 12; Zool. Jahrb. Syst. XIII 1900, p. 487.

*Mabuia rugifera*, Boulenger, Zool. Rec. 1896, p. 22.

*Mabuia rugifera*, part., Brown, Proc. Acad. Philad. LIV 1902, p. 177.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, horizontal, with pointed lobules round its border. Nostril large, in the posterior part of the nasal; a postnasal; supranasals present; frontonasal as broad as long, in contact with the rostral and with the frontal; latter as long as frontoparietals and parietals together or longer, in contact with the two anterior supraoculars; four supraoculars, second largest; six or seven supraciliaries; frontoparietals larger than the interparietal, which is very small; parietals broad, forming a suture, with eleven or twelve strong keels on the posterior part; a pair of multicarinate nuchals; sixth upper labial largest and below the eye. Body with 28 scales round the middle; nuchal, dorsal and lateral scales with five strong keels, six or eight ventral series smooth. Tail twice the length of head and body. Limbs strong, the upper scales with two or three keels; the

hind limb reaches slightly beyond the elbow; digits a little compressed, with smooth lamellae below.

Dark brown above, uniform or with five or seven narrow whitish longitudinal lines; flanks anteriorly dark, light-spotted; lips greenish-white, spotted with brown. Lower parts greenish-white; scales of throat sometimes with brown lateral edges. Length of head and body 63 mm.; tail 132 mm.

Habitat: Simalur!; Sumatra (Simbolon in Raja Mts., Deli!, Sungei Lalak in Indragiri); Java (Tengger Mts. 1200 M.)? <sup>1</sup>); Borneo (Kuching)? <sup>2</sup>). — Malacca.

## 2. *Mabuia rugifera* (Stol.).

*Tiliqua rugifera*, Stoliczka, Journ. As. Soc. Beng. XXXIX 1870, p. 170, pl. X, fig. 3.

*Mabuia rugifera*, Boulenger, Cat. Liz. III 1887, p. 184 (s. syn.).

*Mabuia rubricollis?*, Bartlett, Croc. Liz. Borneo Sarawak Mus. 1895, p. 89.

Snout short, obtuse; lower eyelid scaly; ear-opening very small, oval, horizontal, with lobules round its border. Nostril in the posterior part of the nasal; usually no postnasal; supranasals present; frontonasal more broad than long, in contact with the rostral and with the frontal; latter longer than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, second largest; five or six supraciliaries; frontoparietals larger than the interparietal; parietals separated; a pair of nuchals; fifth or sixth upper labial largest, not narrowed inferiorly and below the eye. Body with 26 scales round the middle; nuchal, dorsal and lateral scales with five strong keels, eight or ten ventral series smooth. Tail one time and two thirds the length of head and body. Limbs strong with keeled scales, the hind limb reaches the elbow; digits with smooth lamellae below.

Dark olive-brown above, uniform or with 5 or 7 light longitudinal lines. Lower parts greenish-white (in life orange-red). Length of head and body 65 mm.; tail 120 mm.

Habitat: Nias; Mentawai Islands (Sipora!); Java (Tengger

1) A specimen, indicated by Boettger (Offenb. Ver. Naturk. 29—32, 1892, p. 118) as *M. rugifera* Stol. with 28 series of scales.

2) Specimens, indicated by Brown (op. cit.) as *M. rugifera* Stol. with 28 or 29 series of scales, postnasal present.

Mts. 1200 M.); Borneo (Matang!, Sarawak, Kuching). — Malacca; Nicobars <sup>1</sup>).

### 3. *Mabuia multicarinata* (Gray).

*Tiliqua multicarinata*, Gray, Cat. 1845, p. 109.

*Mabuia multicarinata*, Boulenger, Cat. Liz. III 1887, p. 185, pl. XI fig. 2.

Snout short, obtuse; lower eyelid scaly; ear-opening round, smaller than the eye-opening, no lobules. Nostril in the posterior part of the nasal; no postnasal; supranasals present; frontonasal as long as broad, in contact with the rostral and with the frontal; latter as long as frontoparietals and interparietal together or longer, in contact with the second supraocular; four supraoculars, second largest; five or six supraciliaries; frontoparietals larger than the interparietal; parietals separated; a pair of nuchals; fifth or sixth upper labial below the eye, large. Body with 28—30 scales round the middle; nuchals, dorsals and laterals with five or seven strong keels, ten or twelve ventral series smooth. Tail not quite twice the length of head and body. Limbs strong, the upper scales with two or three keels; the hind limb reaches the elbow; digits compressed, with smooth lamellae below.

Olive-brown above, with small dark brown spots or lines; a dark brown, light-edged lateral band, beginning at the eye; flanks light-spotted. Lower parts greenish-white; sometimes brown spots on the throat. Length of head and body 85 mm.; tail 143 mm.

Habitat: Borneo (Kina Balu); Karakelang Islands!. — Philippines.

### 4. *Mabuia rudis* Boulenger.

*Mabuia rudis*, Boulenger, Cat. Liz. III 1887, p. 188, pl. XI fig. 3.

*Mabuia lewisi*, E. Bartlett, Crocod. Liz. Borneo 1895, p. 93.

Snout short, obtuse; lower eyelid scaly; ear-opening round, half the diameter of the eye-opening, sometimes with small

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1) In the British Museum there is a specimen from Sumatra (Deli), named *M. rugifera*, which has 28 scales round the middle of the body and the parietals forming a suture; I considered this specimen as *M. quinquecarinata*. As it was the only indication of *M. rugifera* from Sumatra, I left out that island in my list, but very probably *M. rugifera* will occur there too, being found on all the neighbouring islands.

lobules anteriorly. Nostril in the posterior part of the nasal; a postnasal; supranasals present; frontonasal more broad than long, in contact with the rostral and sometimes with the frontal; praefrontals usually forming a suture; frontal slightly longer than frontoparietals and interparietal together, in contact with the second supraocular; four supraoculars, second largest; six supraciliaries, second small; frontoparietals larger than the interparietal; parietals separated; a pair of nuchals, keeled at their posterior border; fifth upper labial largest and below the eye. Body with 30—36 scales round the middle, nuchals, dorsals and laterals with three strong keels, which are slightly projecting, ten or twelve ventral series smooth. Tail not quite twice the length of head and body. Limbs strong, the hind limb reaches the axilla or the shoulder; digits compressed, with keeled lamellae below.

Olive-brown above; a dark brown light-edged lateral band, beginning at the eye; flanks brown with light spots. Lower parts brownish or greenish; sometimes black spots on the throat. Length of head and body 120 mm.; tail 220 mm.

**Habitat:** Mentawai Islands (Sipora); Sumatra (Deli!, Dawas-Palembang, Taluk!); Java!; Borneo (Kina Balu, Bongon, Sandakan, Lawas, Baram river, Kuching, Matang, Sarawak, Mt. Dulit, Buntok, Santubong 200 feet, Sintang!, Bloe!, Pontianak); Celebes (Minahassa, Kema, Tomohon, Macassar, Luhu!, Bantimurong).

##### 5. *Mabuia multifasciata* (Kuhl).

*Scincus multifasciatus*, Kuhl, Beitr. Zool. und Vergl. Anat. 1820, p. 126.

*Mabuia multifasciata*, Boulenger, Cat. Liz. III 1887, p. 186 (s. syn.).

Snout short, obtuse; lower eyelid scaly; ear-opening large, round, half the diameter of the eye-opening, with sharp lobules anteriorly or without lobules. Nostril in the posterior part of the nasal; a postnasal; supranasals present, often forming a suture; frontonasal twice as broad as long; praefrontals always in contact; frontal as long as frontoparietals and interparietal together or shorter, in contact with the second or the two anterior supraoculars; four supraoculars, second largest; five or six supraciliaries, second small; frontoparietals larger than the interparietal; parietals separated; a pair of nuchals, keeled or smooth; fifth upper labial largest and below the eye. Body with 30—34 scales round the middle, dorsals with three (some-

times five) keels, nuchals and laterals keeled or smooth. Tail about one time and a half the length of head and body. Limbs strong, the hind limb does not reach the axilla, scales of upper part with two or three keels; digits long, compressed, with smooth lamellae below.

Brown or olive above, uniform, or the scales with blackish lateral borders, forming longitudinal lines; sometimes a light dorso-lateral band or a light, reddish stripe on each side

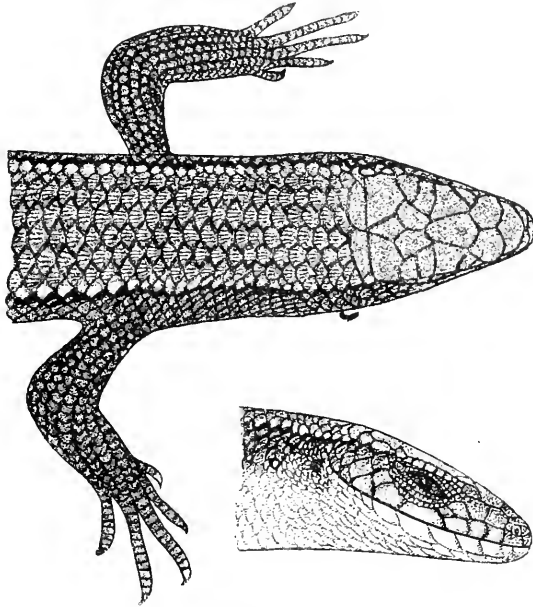


Fig. 69. *Mabua multifasciata* (Kuhl).

anteriorly; flanks dark brown with light, black-edged spots. Lower parts greenish or bright sulphur; throat sometimes bluish-white. Length of head and body 130 mm.; tail 220 mm.

Nom. indig. Kadal (mal.); Hilé (Simalur).

Habitat: Simalur!; Nias!; Engano; Sumatra (Atjeh, Fort de Kock!, Gambir! and Medan! in Deli, Lower Langkat, Sibolga!, Benakat in Palembang, Raja Mts., Indragiri, Agam, Solok!, Singkarak!, Kaju tanam!, Gunung Sahilan!, Alahan Pandjang!, Ajerbangis!, Tilatang!, Padang!, Tandjong); Banka!; Riou; Natuna Islands; Borneo (Labuan, Matang, Sintang!, Smitau!, Howong river!, Kuching, Sarawak, Baram river, Sandakan Bay!, Kina Balu, Samarinda!, Bandjermasin); Java (Gadok, Batavia!, Buiten-

zorg!, Tjibodas 1425 M., Preanger!, Nusa Kembangan!, Surakarta!, Tegal!, Bagelen!, Wonosobo, Gunung Sewu!, Willis Mts. in Kediri 5000 feet, Tengger Mts. 1200 M.); Lombok!; Sumbawa; Flores!; Timor!; Samao!; Ombaai (or Alor); Wetar; Damma!; Timor Laut; Aru Islands; Celebes (Gorontalo, Manado, Rurukan, Tomohon, Kema, Loka, Luhu, Kandari, Macassar!, Sakedi, Rumbi Mengkoka, Puriala); Buru; Ceram!; Ambon!; Saparua; Uliassers!; Batjan!; Ternate!; Halmahera; Waigeu!; New Guinea (Fak Fak, Wiak Island-Schouten Group). — Malacca; Siam; Burma; Nicobars; Andamans; Philippines; Pelew Islands.

One of the most widely spread lizards of the Archipelago.

### 3. *Lygosoma* Gray.

(GRAY, Zool. Journ. III p. 228, 1827).

Palatines in contact; pterygoids in contact in front, the palatal notch not extending to between the centre of the eyes (fig. 67 *b*). Pterygoids with small or without teeth; maxillary teeth conical or obtuse. Eyelids distinct, movable; ear distinct and more or less sunk, or hidden. Nostril in the nasal; supranasal present or absent. Limbs well developed, rudimentary or absent.

Distribution. Southern Asia; Australia; North and Central America; tropical and South-Africa.

### Synopsis of the sections.

#### A. Lower eyelid scaly.

##### I. Limbs well developed.

- a.* Supranasals present; ear-opening very large; praeanasals enlarged . . . . . 1. *Otosaurus* p. 165.
- b.* Supranasals present, but very small; ear-opening large. . . . . 2. *Parotosaurus* p. 167.
- c.* No supranasals; tympanum distinct; praeanasals enlarged. . . . . 3. *Hinnulia* p. 170.
- d.* Supranasals present or absent; ear-opening small; praeanasals not enlarged. . . . . 4. *Kenensia* p. 198.

##### II. Limbs short, or rudimentary, or absent.

- a.* Limbs short; no supranasals; tympanum distinct; frontal not broader than supraocular region. . . . . 5. *Homolepida* p. 205.
- b.* Limbs short, rudimentary or absent; no supranasals; ear-opening distinct or absent; prae-



- frontals small and separated; frontal broader than supraocular region . . . . . 6. *Lygosoma* p. 212.
- B. Lower eyelid with a transparent disk; limbs well developed.
- I. No supranasals; tympanum distinct; enlarged nuchals present. . . . . 7. *Lioclepisma* p. 227.
- II. Supranasals present; tympanum distinct; preanals not or slightly enlarged. . . . . 8. *Emoa* p. 245.
- C. Lower eyelid scaly or with a transparent disk; limbs short.
- a. Ear distinct; supranasals present . . . . . 9. *Riopa* p. 262.
- b. Ear-opening minute or covered; no supranasals. 10. *Siaphos* p. 269.

### Section *Otosaurus* Gray.

Lower eyelid scaly; ear-opening very large, without lobules; supranasals present, large. Frontal not broader than supraocular region; frontoparietal and interparietal distinct. Praeanals enlarged. Limbs strong, pentadactyle.

### Key to the Indo-Australian species.

- A. 40—44 smooth scales round the body; 6 supraoculars; hind limb does not reach the shoulder; 17—20 lamellae under the fourth toe . . . . . 1. *L. celebense* p. 165.
- B. 46—50 smooth scales round the body; 8 supraoculars; hind limb reaches the shoulder or farther; 22—24 lamellae under the fourth toe. . . . . 2. *L. cumingi* p. 166.

### 1. *Lygosoma celebense* F. Müller.

*Lygosoma celebense*, F. Müller, Verh. Naturf. Ges. Basel X 1894, p. 836.

*Lygosoma celebense*, Boulenger, Proc. Zool. Soc. London 1897, p. 212, pl. XI, fig. 1.

Snout short; lower eyelid scaly; ear-opening large, smaller than the eye-opening, tympanum moderately sunk, no auricular lobules. Nostril in the nasal; two pair of superposed loreals; supranasal large, in contact with its fellow or separated by the frontonasal, which is small, more long than broad, forming a suture with the frontal; latter slightly shorter than parietals and frontoparietals together, in contact with the three anterior supraoculars; six supraoculars, first twice as long as second; 11—13 supraciliaries; frontoparietals and interparietal distinct; parietals forming a suture behind the interparietal; no nuchals; fourth and fifth labials below the eye. 40—44 smooth scales

round the middle of the body; the distance between the end of the snout and the fore limb is two thirds of that between axilla and groin; praecanals enlarged. Tail not quite one time and a half as long as head and body. Limbs well developed; the adpressed hind limb does not reach the shoulder; digits compressed, with 17—20 keeled, divided lamellae under the fourth toe.

Reddish-brown above, spotted with dark or with irregular light-transverse bands; a dorso-lateral series of dark brown spots, sometimes indistinct; lips black with white spots; throat with dark longitudinal lines. Lower parts dirty white; tail black-dotted below. Length of head and body 58 mm.; tail 88 mm.

**Habitat:** Celebes (Mahawu Volcano near Tomohon!, Masarang Volcano, Upper Bone Valley, Rurukan!).

## 2. *Lygosoma cumingi* (Gray).

*Otosaurus cumingii*, Gray, Cat. 1845, p. 93.

*Lygosoma cumingii*, Boulenger, Cat. Liz. III 1887, p. 249, pl. XVI fig. 2.

*Lygosoma cumingii*, Vogt, Sitz. ber. Ges. Naturf. Fr. 1911, p. 417; id. 1912, p. 356.

Snout short; lower eyelid scaly; ear-opening very large, oval, almost as large as the eye-opening; tympanum not much sunk, no lobules. Nostril in the nasal; supranasal large, in contact with its fellow; frontonasal small, a little more broad than long, in contact with the frontal; latter as long as or a little shorter than the frontoparietals and parietals together, in contact with the four anterior supraoculars; eight supraoculars, first twice as long as second, last very small; 12 to 14 supra-ciliaries; frontoparietals and interparietal distinct, about equal; parietals in contact; no nuchals; sixth and seventh upper labials below the eye. 46—50 smooth scales round the middle of the body, laterals smallest; the distance between the tip of the snout and the fore limb nearly equals that between axilla and groin; praecanals enlarged. Tail about one time and a half the length of head and body. Limbs well developed; the adpressed hind limb reaches the shoulder or halfway between the shoulder and the ear; digits long, compressed, fourth toe with 22—24 keeled, divided lamellae below.

Reddish-brown above, spotted with black; a lateral series of blackish spots, very large on the sides of the neck, and bordered with small white spots; lips spotted with brown.

Lower parts yellowish-white; sometimes small brown spots on the throat. Length of head and body 80 mm.; tail (repr.) 88 mm. (Not seen by me).

Habitat: ? New Guinea (Sepik river). — Philippines.

Note: This species probably does not occur in the Indo-Australian Archipelago. It seems to me, that the specimens captured in Dutch New Guinea (see Vogt, op. cit. 1912, p. 356), belong to another species, as the author gives a few characters, in which the three animals differ from *L. cumingi*: five supraoculars; praefrontals in contact; 41 scales round the body.

### Section *Parotosaurus* Boulenger.

This section connects *Otosaurus* and *Hinulia*.

Lower eyelid scaly; ear-opening large, no auricular lobules; supranasals present, very small. Frontal not broader than the supraocular region; frontoparietals and interparietal distinct. Praecanals enlarged. Limbs strong, pentadactyle.

### Key to the Indo-Australian species.

- A. 36 scales round the body, laterals and dorsals granulate; 7 supraoculars; no nuchals; tympanum slightly sunk . . . . . 3. *L. granulatum* p. 167.
- B. 50 smooth scales round the body; 9 supraoculars; no nuchals; tympanum slightly sunk . . . . . 4. *L. annectens* p. 168.
- C. 40 smooth scales round the body; 7 supraoculars; three pair of nuchals; tympanum deeply sunk . . . 5. *L. mimikanum* p. 169.

### 3. *Lygosoma granulatum* Boulenger.

*Lygosoma granulatum*, Boulenger, Proc. Zool. Soc. London 1903, p. 126, pl. XII fig. 2.

Snout very short, obtuse; lower eyelid scaly; ear-opening large, oval, as large as the eye-opening, tympanum slightly sunk, no auricular lobules. Nostril in the nasal; supranasal present, very small, between the frontonasal, the nasal and the first loreal, which is single; frontonasal much more broad than long, forming a straight suture with the rostral and just touching the angle of the frontal; latter slightly longer than frontoparietals and interparietal together, narrowed posteriorly, in contact with the three anterior supraoculars; seven supraoculars, first more than twice as long as second, seventh minute; eleven

supraciliaries, first largest; frontoparietals slightly longer than the interparietal; parietals in contact behind the latter; no nuchals, each parietal in contact with four scales; fourth to sixth upper labials below the eye. Body with 36 scales round the middle, dorsals larger than ventrals, laterals smallest, dorsals and laterals rough with very small granules; the distance between the tip of the snout and the fore limb is contained one time and one third in the distance between axilla and groin; praeanals enlarged. Tail one time and a half the length of head and body. Limbs strong, the hind limb reaches the axilla; digits long, compressed, fourth toe with 20 obtusely keeled lamellae below.

Pale reddish-brown above, variegated with dark brown; flanks with large dark brown spots, forming vertical bars, below those reticulated with dark brown; a white spot above the tympanum and one above the shoulder; lips dark-spotted. Lower parts lighter; throat dark brown. Length of head and body 45 mm.; tail 72 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Albert Edward Range 6000 feet!).

#### 4. *Lygosoma annectens* Boulenger.

*Lygosoma annectens*, Boulenger, Ann. Mus. Civ. Genova (2) XVIII 1897, p. 698, pl. VII fig. 2.

Snout very short, obtuse; lower eyelid scaly; ear-opening large, oval, smaller than the eye-opening, tympanum slightly sunk, no auricular lobules. Nostril in the nasal; latter followed by two or three superposed shields, the upper one representing a supranasal; frontonasal more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter as long as frontoparietals and interparietal together, in contact with the three anterior supraoculars; nine supraoculars, first twice as long as second, last minute; twelve supraciliaries; frontoparietals a little longer than the interparietal; parietals forming a suture behind the latter; no nuchals, each parietal in contact with five scales; fifth to seventh upper labials below the eye. Body with 50 smooth scales round the middle, laterals smallest; the distance between the tip of the snout and the fore limb nearly equals the distance between axilla and groin; praeanals enlarged. Tail one time and three fifths the length of head and

body. Limbs strong, the hind limb reaches the axilla; digits long, compressed; fourth toe with 21 uncarinate, divided lamellae below.

Brown above, with a dark brown network, and yellowish spots; a round black spot above the shoulder. Lower parts yellowish. Length of head and body 48 mm.; tail 74 mm. (After Boulenger, not seen by me).

Habitat: New Guinea (Moroka in Bartholomew Range 2300 feet).

Only one specimen known.

### 5. *Lygosoma mimikanum* Boulenger.

*Lygosoma mimikanum*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 257, pl. XXIX fig. 2.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, smaller than the eye-opening, the tympanum deeply sunk, no lobules. Nostril in the nasal; a very small triangular supranasal between the frontonasal, the nasal and the postnasal; frontonasal more broad than long, in contact with the rostral and with the single praefrontal (the praefrontals being fused in the only known specimen); frontal narrowed behind, as long as frontoparietals and interparietal together, in contact with the first supraciliary and the three anterior supraoculars; seven supraoculars, first longest, last very small; twelve supraciliaries, first largest; frontoparietals a little larger than the interparietal; parietals in contact; three pair of nuchals; fifth to seventh upper labials below the eye. Body stout; the distance between the tip of the snout and the fore limb is contained one time and one third in that between axilla and groin; 40 smooth scales round the middle, dorsals largest, laterals smallest; praeanals enlarged. Limbs strong, the hind limb reaches the elbow; digits short, compressed, fourth toe with 15 or 16 lamellae below, most of them obtusely keeled.

Reddish-brown above, spotted with brown, the spots forming numerous irregular transverse series; a dark brown spot behind and below the eye; lips light, with dark brown spots. Lower parts white. Length of head and body 90 mm.; tail (reprod.) 105 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Mimika river!).

Section *Hinulia* Gray (fig. 70).

Lower eyelid scaly; tympanum distinct; no supranasals. Frontal not broader than the supraocular region; frontoparietals usually distinct. Praeanals usually enlarged. Limbs strong, pentadactyle, the hind limb longer than the distance between the centre of the eye and the fore limb.

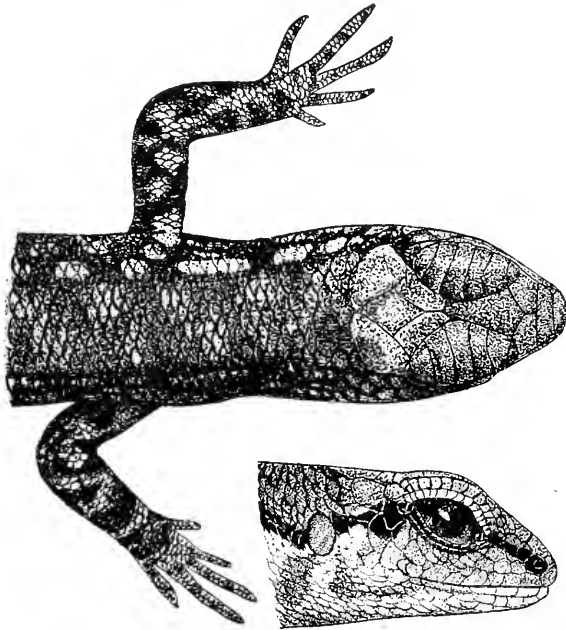


Fig. 70. Section *Hinulia*. *Lygosoma variegatum* Peters.

## Key to the Indo-Australian species.

- A. Ear-opening with small lobules anteriorly.
1. Six or seven supraoculars; 44—50 scales round the body . . . . . 6. *L. florense* p. 173.
  2. Four supraoculars; 24—34 scales round the body . . . . . 7. *L. lesucuri* p. 174.
  3. Three supraoculars; 28 or 30 scales round the body . . . . . 8. *L. dorsale* p. 175.
- B. No auricular lobules.
- I. Four supraoculars.
    - a. Praefrontals in contact.
      1. Dorsal scales as large as ventrals.
        - † 32 scales round the body; interparietal as large as frontoparietals.

- \* Limbs meeting or overlapping;  
tail as long as head and body;  
rostral very low . . . . . 9. *L. modiglianii* p. 175.
- \* Limbs not meeting; tail much  
longer than head and body . . . 10. *L. malayanum* p. 176.
- †† 30—32 scales round the body; inter-  
parietal very large. . . . . 11. *L. consobrinum* p. 176.
2. Dorsal scales larger than ventrals.
- aa. 20 smooth lamellae under the fourth  
toe; 32 scales round the body;  
interparietal smaller than fronto-  
parietals. . . . . 12. *L. rufum* p. 177.
- bb. 22 smooth lamellae under the fourth  
toe; 24 scales round the body;  
interparietal as long as fronto-  
parietals. . . . . 13. *L. büttikoferi* p. 177.
- cc. 28 smooth lamellae under the fourth  
toe; 30 scales round the body;  
interparietal as long as fronto-  
parietals. . . . . 14. *L. maindroni* p. 178.
- dd. 29 smooth lamellae under the fourth  
toe; 34 scales round the body;  
interparietal as long as fronto-  
parietals. . . . . 15. *L. shelfordi* p. 179.
- b. Praefrontals separated.
1. No regular nuchals; some enlarged  
scales bordering the parietals.
- † 26 scales round the body; 18—20  
smooth lamellae under the fourth toe 16. *L. emigrans* p. 179.
- †† 26 scales round the body; 22 smooth  
lamellae under the fourth toe . . . 17. *L. tenuiculum* p. 180.
2. One or more pair of large, transverse  
nuchals.
- a. 22 scales round the body . . . . 18. *L. minutum* p. 181.
- b. 24 scales round the body, the 2  
vertebral series enlarged, more than  
twice as broad as long; three pair  
of nuchals . . . . . 19. *L. nototaenia* p. 181.
- c. 26—28 scales round the body, the  
2 vertebral series enlarged; three  
or four pair of nuchals. . . . . 20. *L. elegantulum* p. 182.
- d. 28 scales round the body; the 2  
vertebral series more than twice as  
broad as long; six pair of nuchals 21. *L. nigrolineatum*, p. 183.
- II. Five or more supraoculars.
- a. One anterior loreal.
- † 20—30 scales round the body; (one)  
three or four pair of nuchals.

1. 20—22 scales round [the body; 12 lamellae under the fourth toe . . . 22. *L. schultzei* p. 184.
  2. 24—26 scales round the body; 36—39 lamellae under the fourth toe; no enlarged praeanales . . . . . 23. *L. louisianense* p. 185.
  3. 28 scales round the body; 16 lamellae under the fourth toe; frontal as long as frontoparietals and interparietal together . . . . . 24. *L. aruanum* p. 186.
  4. 28 scales round the body; 20 lamellae under the fourth toe; frontal not or slightly longer than frontoparietals 25. *L. undulatum* p. 186.
  5. 28 scales round the body; 18 lamellae under the fourth toe; frontal as long as the frontoparietal; one pair of nuchals . . . . . 26. *L. moszkowskii* p. 187.
- †† 30—50 scales round the body; no nuchals.
1. Five supraoculars.
    - a. 30—32 scales round the body; 33—42 lamellae under the fourth toe . . . . . 27. *L. aignanum* p. 187.
    - b. 32—34 scales round the body; 25—30 lamellae under the fourth toe . . . . . 28. *L. sanctum* p. 188.
  2. Six or seven supraoculars.
    - a. 40 scales (42) round the body; 26 lamellae under the fourth toe . . 29. *L. striolatum* p. 189.
    - b. 42 scales round the body; 34 lamellae under the fourth toe . . . 30. *L. kühnei* p. 190.
    - c. 44—50 scales round the body; 17—19 lamellae under the fourth toe . . . . . 31. *L. melanopogon* p. 191.
- b. Two superposed shields behind the nasal.
- \* Dorsal scales keeled.
1. 40—50 scales round the body; praefrontals forming a suture; the hind limb reaches the shoulder . . . . . 32. *L. nigrilabre* p. 192.
  2. 42—44 scales round the body; praefrontals separated . . . . . 33. *L. tropidonotus* p. 193.
  3. 40 scales round the body; praefrontals forming a suture; the hind limb reaches halfway between the fore limb and the ear . . . . . 34. *L. sinum* p. 193.
- \*\* Dorsal scales smooth.
- a. Five supraoculars.
    1. 16—18 lamellae under the fourth toe; 38 scales round the body . . 35. *L. anomalopus* p. 194.
    2. 18—27 lamellae under the fourth toe; 38—46 scales round the body 36. *L. jobiense* p. 195.



- b. Six to eight supraoculars; 38—40  
 scales round the body . . . . . 37 *L. variegatum* p. 196.  
 c. Seven to eight supraoculars; 44—46  
 scales round the body . . . . . 38. *L. sarasinorum* p. 198.

### 6. *Lygosoma florense* M. Weber.

*Lygosoma florense*, M. Weber, Zool. Ergebn. Reise N. O.-Indien I 1890/91, p. 173, pl. XIV, fig. 2, 3.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, nearly as large as the eye-opening, with five to six lobules anteriorly. Nostril in the nasal; no supranasals; fronto-nasal nearly twice as broad as long, forming a straight, broad suture with the flat rostral; a single anterior loreal; praefrontals in contact; frontal as long as frontoparietals and interparietal together, in contact with the four anterior supraoculars; six or seven supraoculars, first a little longer than second; twelve supraciliaries; first largest; frontoparietals and interparietal subequal; parietals in contact; no nuchals; fifth and sixth upper labials largest and below the eye. Body with 44—50 finely striated scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and a half in that between

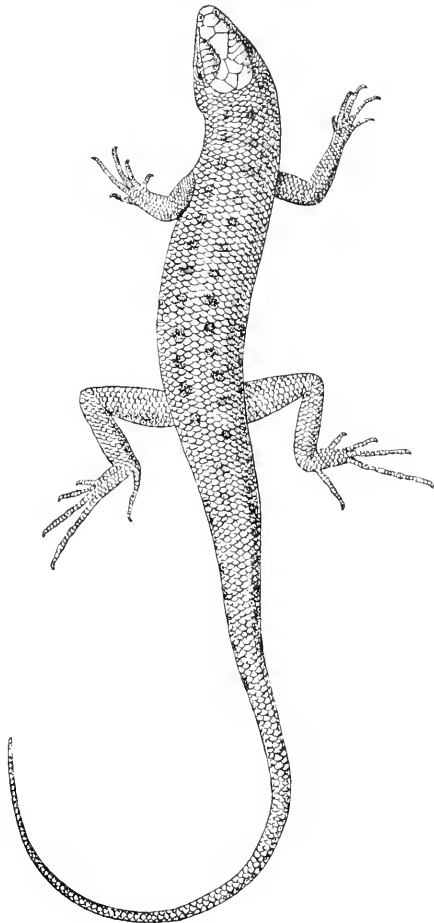


Fig. 71. *Lygosoma florense* M. Weber.  
 (After Max Weber).

axilla and groin; praeanales enlarged. Tail nearly one time and two thirds the length of head and body. Limbs strong, the hind limb reaches the shoulder; digits long, compressed, fourth toe with 27—29 smooth lamellae below.

Pale brown above, with metallic gloss and irregularly distributed dark brown spots; flanks with dark brown vertical spots. Lower parts whitish; throat black, white-spotted, tail blackish below. Young specimens with a dark lateral band, edged above with white. Length of head and body 71 mm.; tail 110 mm.

Type-specimens examined in the Amsterdam Museum.

Habitat: Flores!; Adonara!; Gr. Bastaard!; Ombaai; Wetar; Damma!; Samao!; Timor.

### 7. *Lygosoma lesueurii* Dum. & Bibr.

*Lygosoma lesueurii*, Dum. & Bibr., *Erpét. Gén.* V 1839, p. 733.

*Lygosoma lesueurii*, Boulenger, *Cat. Liz.* III 1887, p. 225 (s. syn.).

Snout obtuse; lower eyelid scaly; ear-opening oval, almost as large as the eye-opening, with four or five lobules anteriorly. Nostril in the nasal; no supranasals; frontonasal more broad than long, usually in contact with the rostral; praefrontals forming a suture; frontal as long as or a little longer than frontoparietals and interparietal together, in contact with the three anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietals as long as or shorter than the interparietal; parietals in contact; two to four pair of nuchals; fifth and sixth, or sixth and seventh upper labials largest and below the eye. Body slender, the distance between the end of the snout and the fore limb is contained one time and a half to two times in that between axilla and groin; 24—34 smooth scales round the middle, the two vertebral series enlarged, laterals smallest; praeanales enlarged. Tail long, more than twice the length of head and body. Limbs strong, the hind limb reaches the wrist or the elbow; digits long, compressed, fourth toe with 22—26 slightly keeled lamellae below.

Brown, olive or black above, with a broad black vertebral band, edged on both sides with white; a narrow white, black-edged dorsolateral line; flanks dark, with longitudinal series of white spots; a white streak, beginning above the axilla to the groin. Lower parts white. Length of head and body 85 mm.; tail 190 mm.

Habitat: New Guinea (Merauke!). — N.W. Australia, Cape York.

### 8. *Lygosoma dorsale* Boulenger.

*Lygosoma dorsale*, Boulenger, Cat. Liz. III 1887, p. 226, pl. XII fig. 1.

Differing from the preceding species on the following characters: two or three auricular lobules, three supraoculars, first very large; frontal much longer than frontoparietals and interparietal together. Limbs slightly overlapping, when adpressed; 28 or 30 scales round the body.

Pale brown above, a black vertebral streak; a yellowish black-edged lateral streak; a lateral series of black spots and an indistinct light, dark-edged streak from axilla to groin. Lower parts white. Length of head and body 94 mm.; tail 130 mm.

Habitat: New Guinea (Fly river). — Islands of Torres Straits; near Cooktown.

### 9. *Lygosoma modiglianii* Boulenger.

*Lygosoma modiglianii*, Boulenger, Ann. Mus. Civ. Genova (2) XIV 1895, p. 614.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral very low, thrice as broad as deep; frontonasal much more broad than long, forming a broad straight suture with the rostral; praefrontals in contact; frontal as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; five supra-ciliaries; frontoparietals and interparietal equal; parietals in contact; no nuchals; fourth and fifth labials below the eye. Body with 32 scales round the middle, dorsals as large as ventrals, laterals smaller; the distance between the tip of the snout and the fore limb is contained one time and two fifths to one time and a half in the distance between axilla and groin; praeanales enlarged. Limbs meeting or slightly overlapping, when adpressed; digits moderate, fourth toe with 15 smooth lamellae below.

Brown above, sides darker, light-spotted; lips with dark vertical bars. Lower parts whitish. Length of head and body 41 mm.; tail (tip broken) 41 mm.

Type-specimen examined in the British Museum.

Habitat: Mentawai Islands (Sipora!).

10. *Lygosoma malayanum* Doria.

*Lygosoma (Hinnulia) malayanum*, Doria, Ann. Mus. Civ. Genova (2) VI 1888, p. 651.

*Lygosoma malayanum*, M. Weber, Zool. Ergebn. Reise N.O. Indien I 1890/91, p. 170.

Snout obtuse; lower eyelid scaly; ear-opening large, roundish, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; a single anterior loreal; frontonasal more broad than long, in contact with the rostral; praefrontals large, broadly in contact; frontal a little shorter than frontoparietals and parietal together, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietals and interparietal subequal; parietals in contact; no nuchals; fifth and sixth upper labials below the eye. Body slender; the distance between the end of the snout and the fore limb is contained one time and three fifths in that between axilla and groin; 32 smooth scales round the middle, subequal; praeanales slightly enlarged. Tail thick, much longer than head and body. Limbs short, not meeting, when adpressed; digits short, fourth toe with 13—15 smooth lamellae below.

Pale brown above with small black spots in longitudinal series or dark brown with yellowish reticulations; a dark lateral band, edged with light, beginning at the eye; flanks brown-spotted. Lower parts whitish. Length of head and body 65 mm.; tail 85 mm.

Habitat: Sumatra (Mt. Singalang, Alahan Pandjang 1500 M.). — Malacca.

11. *Lygosoma consobrinum* Peters & Doria.

*Lygosoma (Hinnulia) consobrinum*, Peters & Doria, Ann. Mus. Civ. Genova, XIII 1878, p. 342.

*Lygosoma consobrinum*, Boulenger, Cat. Liz. III 1887, p. 240.

Lower eyelid scaly; ear-opening round, no lobules. Rostral small; no supranasals; frontonasal twice as broad as long; praefrontals in contact; frontal with a long posterior angle; four supraoculars; frontoparietals long; interparietal large, rhomboidal; seven upper and six to seven lower labials. Body with 30—32 smooth scales round the middle, laterals smallest; praeanales enlarged. The fore limb reaches the corner of the mouth, the hind limb equals two thirds of the distance between axilla and groin.

Reddish-brown above, variegated with irregular dark spots;

flanks blackish with whitish wavy transverse lines. Lower parts yellowish; chin and throat with black spots or longitudinal lines. Length of head and body 35 mm. (Not seen by me).

Habitat: Batjan; Halmahera.

### 12. *Lygosoma rufum* Boulenger.

*Lygosoma rufum*, Boulenger, Cat. Liz. III 1887, p. 239.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral; praefrontals meeting with the inner angles; frontal almost as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, followed by a very small one; nine or ten supraciliaries; frontoparietals longer than interparietal; parietals in contact; no nuchals; fifth upper labial below the eye. Body with 32 smooth scales round the middle, the two vertebral series enlarged, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and two fifths in that between axilla and groin; praeanales enlarged. Limbs strong, slightly overlapping when adpressed; digits short, compressed, fourth toe with 20 smooth, divided lamellae below.

Reddish-brown above, variegated with darker and lighter tints. Lower parts brownish-white. Length of head and body 60 mm.; tail (reproduced) 48 mm.

Type-specimen examined in the British Museum.

Habitat: Aru Islands!.

### 13. *Lygosoma büttikoferi* Lidth.

*Lygosoma büttikoferi*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 193.

Snout short; lower eyelid scaly; ear-opening roundish, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal much more broad than long, forming a narrow suture with the rostral; praefrontals in contact; frontal shorter than frontoparietals and interparietal together, narrowly pointed behind, in contact with two supraoculars; four supraoculars; nine supraciliaries; frontoparietals and interparietal subequal; parietals in contact; no nuchals, parietals bordered by four scales, the anterior of which is very large. Body long, the distance between the tip of the snout and the fore limb

is contained one time and one fourth in the distance between axilla and groin; 24 smooth scales round the middle, dorsals largest; praeanal scales enlarged. Tail thick, one time and one fourth to one and one fifth the length of head and body. Limbs strong, overlapping, the hind limb a little longer than the distance between the tip of the snout and the fore limb; fourth toe with 22 smooth lamellae below.

Reddish-brown above, with four longitudinal series of darker spots, two on the back and one on each side, beginning behind the eye. Lower parts lighter. Length of head and body 35 mm.; tail 40 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Liang Kubung!).

#### 14. *Lygosoma maindroni* Sauvage.

*Lygosoma (Hinulia) maindroni*, Sauvage, Bull. Soc. Philom. (7) III 1878, p. 55.

*Lygosoma maindroni*, Boulenger, Cat. Liz. III 1887, p. 239.

Snout short; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral with a pointed upper border; a single anterior loreal; frontonasal more broad than long, in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, pointed behind, in contact with the two anterior supraoculars; four supraoculars; ten supraciliaries, first largest; frontoparietals and interparietal equal; parietals in contact; five pair of nuchals; sixth upper labial below the eye. Body slender, the distance between the tip of the snout and the fore limb is contained one time and one third in that between axilla and groin; 30 smooth scales round the middle, the two vertebral series enlarged, laterals smallest; praeansals enlarged. Tail one time and a fourth to one time and three fifths the length of head and body. Limbs strong, the hind limb reaches the elbow; digits slender, compressed, fourth toe with 28 smooth divided lamellae below.

Dark brown above, with wavy transverse lines of yellowish spots on the back and tail; sometimes a dorso-lateral series of blackish spots; lips with dark bars. Lower parts yellowish; throat with irregular or longitudinal dark brown lines. Length of head and body 60 mm.; tail 75 mm.

Habitat: New Guinea (Haas, Tanah Merah Bay!, Humboldt Bay!, Mt. Victoria!, Madew on St. Joseph river 2—3000 feet!).—New Britain.

15. *Lygosoma shelfordi* Boulenger.

*Lygosoma shelfordi*, Boulenger, Proc. Zool. Soc. London 1900, p. 182, pl. XIV, fig. 1.

Snout short, obtusely pointed; lower eyelid scaly; ear-opening oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal as long as broad, in contact with the rostral; praefrontals meeting; frontal narrow, as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest; seven supraciliaries; frontoparietals and interparietal subequal; parietals forming a suture; a single pair of nuchals; fifth upper labial below the eye. Body with 34 smooth scales round the middle, dorsals a little larger than laterals and ventrals; the distance between the tip of the snout and the fore limb is contained one time and two fifths in that between axilla and groin; praeanales enlarged. Tail as long as head and body. Limbs strong, slightly overlapping when adpressed; digits moderate, compressed, fourth toe with 29 smooth lamellae below.

Olive-brown above, irregularly spotted with black; a black lateral stripe from the end of the snout to the groin, passing through the eye and above the tympanum, broken up into spots on the side of the body. Lower parts olive-grey. Length of head and body 67 mm.; tail 68 mm.

Type-specimen examined in the British Museum.

Habitat: Borneo (Mt. Penrisen 3000 feet!).

16. *Lygosoma emigrans* Lidth.

*Lygosoma emigrans*, v. Lidth de Jeude, Notes Leyden Mus. XVI 1895, p. 125; id. XVIII 1896/97, p. 253 pl. VI fig. 3.  
*Lygosoma everetti*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 504.

Snout obtuse; lower eyelid scaly; ear-opening round, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal much more broad than long, forming a suture with the rostral and with the frontal; latter as long as frontoparietals and interparietal together or a little shorter,

in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietals and interparietal equal, or latter shortest; parietals in contact; a pair of temporals and a pair of nuchals with a small median scale between; fourth to sixth upper labials below the eye. Body very slender, the distance between the tip of the snout and the fore limb is contained about one time and three fourths in that between axilla and groin; 26 smooth scales round the middle, dorsals largest; praeanales enlarged. Tail thick, not quite one time and a half the length of head and body. Limbs short, the hind limb half as long as the distance between axilla and groin; fourth toe with 18—20 smooth lamellae below.

Brown above with black spots; flanks dark brown, white-spotted; a dark brown band, edged above with white, beginning at the nostril, passing through the eye and above the ear; flanks brown-spotted; lips brown and white-spotted. Lower parts white. Length of head and body 66 mm.; tail 77 mm.

Type-specimen examined in the Leyden Museum; type-specimen of *Lygosoma everetti* examined in the British Museum.

Habitat: Pulu Sukur N. off Flores!; Sumba!; Samao!; Gr. Bastaard!; New Guinea (Astrolabe Bay!).

### 17. *Lygosoma tenuiculum* Mocquard.

*Lygosoma tenuiculum*, Mocquard, Le Natural. XII 1890, p. 144; Nouv. Arch. Mus. (3) II 1890, p. 133, pl. VIII, fig. 2.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal much more broad than long, in contact with the rostral and with the frontal; latter a little shorter than the frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietals a little longer than the interparietal; parietals in contact; no nuchals; fifth upper labial below the eye. Body long, the distance between the tip of the snout and the fore limb is contained one time and a half in that between axilla and groin; 26 smooth scales, laterals smallest. Tail thick, longer than head and body. Limbs strong, the hind limb reaches the wrist; digits long, compressed, fourth toe with 22 smooth lamellae below.

Brown above, anteriorly spotted with dark brown; a dark



dorso-lateral band beginning at the nostril, spotted with whitish; flanks brown, white-spotted. Lower parts yellowish. Length of head and body 46 mm.; tail 56 mm.

Type-specimen examined in the Paris Museum.

Habitat: Borneo (Kina Balu!).

### 18. *Lygosoma minutum* Meyer.

*Lygosoma (Hinulia) minuta*, Meyer, Mon. Berl. Ac. 1874, p. 132.

*Lygosoma minutum*, Boulenger, Cat. Liz. III 1887, p. 233.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, much smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; praefrontals very small; frontal shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietals and interparietal subequal; parietals in contact; nuchals present, passing gradually into the vertebral scales; fourth and fifth upper labials largest and below the eye. Body moderately long, with 22 smooth scales round the middle, dorsals largest; praeanals a little enlarged. Tail a little longer than head and body. Limbs moderate, just meeting when adpressed; fourth toe with 15 smooth lamellae below.

Brown above, with a few small lighter and darker spots; lips with dark bars; a dark brown dorso-lateral streak may be present; sometimes a light transverse blotch on the nape and base of the tail. Lower parts pale brown. Length of head and body 36 mm.; tail 50 mm.

Habitat: New Guinea (Dorei, Sermowai river!, near Tami river!, Moroka 2300 feet!, Bogadjim on Astrolabe Bay).

### 19. *Lygosoma nototaenia* Boulenger.

*Lygosoma nototaenia*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 256, pl. XXIX, fig. 1.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; fronto-

parietals and interparietal equal; parietals in contact; a pair of temporals and three pair of nuchals; fifth upper labial below the eye. Body with 24 smooth scales round the middle, the two vertebral series enlarged, more than twice as broad as long; the distance between the tip of the snout and the fore limb is contained one time and a half in that between axilla and groin; praeanals enlarged. Tail thick, about one time and one third the length of head and body. Limbs short, overlapping when adpressed; digits short, compressed, fourth toe with 18 smooth lamellae below.

Reddish-brown above, with a broad blackish-brown vertebral streak, sometimes broken up into spots; a light dorso-lateral streak, edged below with blackish; flanks, sides of head, and limbs blackish-brown, dotted with white; tail reddish-brown with a series of dark spots on each side, the spots separated by light vertical lines. Lower parts brownish-white, tail spotted with brown. Length of head and body 48 mm.; tail (reproduced) 62 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Stekwa river!, Lorentz river!).

#### 20. *Lygosoma elegantulum* Peters & Doria.

*Lygosoma (Hinulia) elegantulum*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 344.

*Lygosoma elegantulum*, Boulenger, Cat. Liz. III 1887, p. 235.

*Sphenomorphus elegantulus*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 91.

Snout short, obtuse; lower eyelid scaly; ear-opening oval; smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter as long as or slightly shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; eight, sometimes seven or nine supraciliaries; frontoparietals and interparietal equal; parietals in contact; three or four pair of nuchals; fifth upper labial below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and three fifths to two times in that between axilla and groin; 26 or 28 smooth scales round the middle, the two vertebral series enlarged, laterals smallest; praeanals enlarged. Tail very thick, about one time and a half the length

of head and body. Limbs short, not meeting when adpressed; digits short, compressed, fourth toe with 16—20 smooth, divided lamellae below.

Brown above, uniform or spotted with black; sometimes the black spots form transverse series on the anterior part of the body; lips spotted with black. Lower parts yellowish. Length of head and body 80 mm.; tail 112 mm.

Habitat: Waigeu!; New Guinea (Sorong, Bégowré river!, Lake Sentani!, Merauke!, Fly river, Bara Bara, Mt. Victoria, Moroka 2300 feet, Haveri, Inawi, Bogadjim). — Ferguson Island; Rossel Island; Islands of Torres Straits; Queensland; Cape York.

### 21. *Lygosoma nigrolineatum* Boulenger.

*Lygosoma nigrolineatum*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 6.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter a little shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietals and interparietal subequal; parietals in contact; six pair of nuchals; fifth upper labial below the centre of the eye. Body moderate; the distance between the tip of the snout and the fore limb is contained one time and a half in that between axilla and groin; 28 smooth scales round the middle, the two vertebral series more than twice as broad as long, fused here and there to a plate-like scale, five or six times as broad as long, laterals smallest; praeanales enlarged. Tail thick, a little longer than head and body. Limbs short, just meeting when adpressed; digits short, compressed, fourth toe with 18 smooth, mostly divided lamellae below.

Brown above, with a broad black dorso-lateral stripe from the posterior corner of the eye to the middle of the tail and separated from its fellow by four and two half scales; each of the four scales between the stripes black-spotted, these spots confluent into four interrupted lines; sides of head and body greyish, speckled with black. Lower parts white; throat and tail speckled with black. Length of head and body 57 mm.; tail 70 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Mt. Victoria in Owen Stanley Range!).

22. *Lygosoma schultzei* Vogt.

*Lygosoma (Hinulia) schultzei*, Vogt, Sitzber. Ges. Naturf. Fr. Berlin IX 1911, p. 4161.

Snout pointed; lower eyelid scaly; ear-opening almost as large as the eye, no lobules. Nostril in the nasal; no supranasals; a single anterior loreal; frontonasal broadly in contact

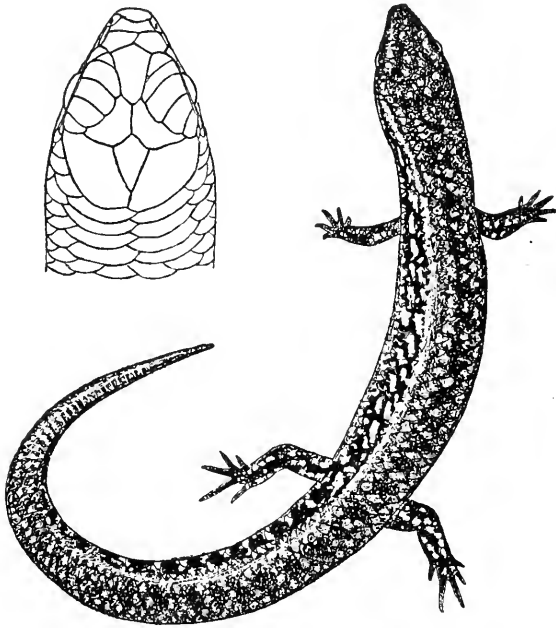


Fig. 72. *Lygosoma schultzei* Vogt.

with the rostral, which reaches far posteriorly; praefrontals forming a suture; frontal longer than the interparietal, pointed posteriorly; five supraoculars; seven supraciliaries; frontoparietals a little shorter than the interparietal; parietals in contact; four pair of nuchals; six upper labials, fourth below the eye, five lower labials. Body slender, with 20—22 scales round the middle, the two vertebral series largest; praeanal scales strongly enlarged. Tail thick, a little longer than head and body. Limbs short, not meeting when adpressed; digits well developed, fourth toe with 12 lamellae below.

Dark brown above, a dark brown dorso-lateral band; flanks brown, with whitish vermiculations, bordered below by a series of black spots; lips dark brown, spotted with white. Lower parts pale brown; throat, praeanals and tail spotted with dark. Length of head and body 29 mm.; tail 34 mm.

Habitat: New Guinea (Near Sepik river 1570 M., Sermowai river!).

### 23. *Lygosoma louisiadense* Boulenger.

*Lygosoma louisiadense*, Boulenger, Ann. Nat. Hist. (7) XII 1903, p. 433.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; a single anterior loreal; frontonasal not quite twice as broad as long, forming a long curved suture with the rostral, and a short one with the frontal; latter a little shorter than frontoparietals and interparietal together, narrowed behind, in contact with the two or three anterior supraoculars; five supraoculars; eight supraciliaries; frontoparietals and interparietal almost equal; parietals in contact; nuchals gradually passing into dorsals; third to fifth upper labials below the eye. Body with 24 or 26 scales round the middle, dorsals largest, dorsals and laterals with very small asperities; the distance between the tip of the snout and the fore limb is contained one time and one fourth or one time and one fifth in the distance between axilla and groin; praeanals not enlarged. Tail one time and a half to nearly two times the length of head and body. Limbs strong, the hind limb reaches the axilla or the shoulder; digits long, slender, compressed, fourth toe with 36—39 narrow smooth lamellae below.

Brown above, a lighter vertebral stripe, with dark brown spots or bars across it; a light dorso-lateral band, beginning above the eyes; a dark brown lateral band below, passing through the eye; a longitudinal black spot with light centre above the axillary region; limbs with dark brown annuli. Lower parts white, throat with dark spots or longitudinal lines. Length of head and body 44 mm.; tail 82 mm.

Type-specimens examined in the British Museum.

Habitat: Rossel Island of the Louisiade Archipelago!.

24. *Lygosoma aruanum* Roux.

*Lygosoma aruanum*, Roux, Abh. Senckenb. Ges. XXXIII 1910, p. 216, Taf. XIII, fig. 1.

Snout short, rounded; lower eyelid scaly; ear-opening oval, a little smaller than the eye, no lobules. Nostril in the nasal; no supranasals; rostral visible from above; anterior loreal in contact with the two anterior labials; praefrontals forming a suture; frontal as long as the frontoparietals and interparietal together, in contact with the two anterior supraoculars; five supraoculars, first longest; nine supraciliaries, first largest; frontoparietals and interparietal distinct, latter a little longer than former; parietals in contact; four pair of nuchals; fifth upper labial below the eye. Body with 28 smooth scales round the middle, laterals smaller than dorsals, the two vertebral series enlarged; the distance between the tip of the snout and the fore limb is contained one time and two fifths in that between axilla and groin; praeanales enlarged. Tail thick, longer than head and body (reproduced); the scales of the median series below largest. Limbs short, not meeting when adpressed; digits moderate, compressed, fourth toe with 16 keeled lamellae below.

Brown above, with many small dark spots, largest in the dorso-lateral region and forming a longitudinal series, beginning at the eye; lips, flanks and tail greyish with darker spots; head dark-spotted; limbs brown and black, digits grey. Lower parts white; throat with irregular grey spots. Length of head and body 52 mm.; tail 54 mm. (After Roux, not seen by me).

Habitat: Aru Islands (Dobo on Wammer).

25. *Lygosoma undulatum* Peters & Doria.

*Lygosoma (Hinulia) undulatum*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 343.

*Lygosoma undulatum*, Boulenger, Cat. Liz. III 1887, p. 238.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, much smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral, which is narrowed and produced superiorly; praefrontals forming a suture; frontal not or slightly longer than the frontoparietals, in contact with the two anterior supraoculars; five supraoculars, first twice as long as second

or longer still; ten supraciliaries; frontoparietals and interparietal subequal; parietals in contact; three or four pair of nuchals; fifth upper labial below the eye. Body with 28 smooth scales round the middle, the two vertebral series very broad, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and two fifths or one time and three fifths in that between axilla and groin; preacnals enlarged. Tail one time and a half the length of head and body. Limbs moderate, slightly overlapping; digits compressed, fourth toe with 20 keeled lamellae below.

Pale brown above, with brown spots or undulated cross bands; a dorso-lateral series of dark brown spots. Lower parts brownish-white; throat spotted with brown, the spots sometimes confluent into lines. Length of head and body 58 mm.; tail 87 mm.

Habitat: Ceram!; New Guinea (Katow!, Andai, Beaufort river!, Mimika river!, Stekwa river!, Fly river); Schouten Islands (Mysore); Kei Islands.

#### 26. *Lygosoma moszkowskii* Vogt.

*Lygosoma moszkowskii*, Vogt, Sitz. ber. Ges. Naturf. Fr. Berlin No. 6, 1912, p. 357.

Snout obtuse; lower eyelid scaly; ear-opening almost as large as the eye, no lobules. Nostril in the nasal; no supranasals; one anterior loreal; frontonasal as broad as long, in contact with the rostral and with the frontal; latter as long as the frontoparietals; five supraoculars; seven supraciliaries; frontoparietals a little longer than the interparietal; parietals in contact; a pair of small nuchals and a pair of temporals; fifth and sixth upper labials largest, below the eye. Body slender, covered with 28 smooth scales, the two vertebral series largest; preacnals enlarged. Tail one time and a half the length of head and body. Limbs not meeting when adpressed; digits moderate, fourth toe with 18 lamellae below.

Blackish-brown above, snout yellowish; lower labials with vertical stripes. Lower parts yellowish. Length of head and body 31 mm.; tail 45 mm. (After Vogt, not seen by me).

Habitat: New Guinea.

#### 27. *Lygosoma aignanum* Boulenger.

*Lygosoma aignanum*, Boulenger, Proc. Zool. Soc. London 1898, p. 921, pl. LVII, fig. 1.

*Lygosoma milneense*, Boulenger, Proc. Zool. Soc. London 1903, p. 125, pl. XII, fig. 1.

Snout long and pointed or short and obtuse; lower eyelid

scaly; ear-opening smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; a single anterior loreal; frontonasal nearly twice as broad as long, broadly in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and parietal together or a little longer, in contact with the three anterior supraoculars; five supraoculars; first largest, last small; nine to eleven supraciliaries, first largest; frontoparietals in contact with the third supraocular, longer than the interparietal; parietals in contact behind the latter; a pair of temporals and a pair of large nuchals or no nuchals at all; three upper labials before the subocular. Body short, with 30—32 scales round the middle, smooth, or dorsals feebly tricarinate, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time or one and one third time in the distance between axilla and groin; praeanales feebly enlarged. Tail one time and a half to one time and three fourths the length of head and body. Limbs strong, the hind limb reaches the shoulder or beyond; digits long and slender, strongly compressed distally, fourth toe with 33—42 smooth lamellae below.

Variable in colour. Brown above, uniform or with a light, dark-edged dorso-lateral streak, meeting its fellow at the base of the tail; some dark brown spots forming cross bars on the back or the sides in females; males with three or four large black spots with white dots between them on each side of the neck; a black loreal and temporal streak; lips yellowish-white or blotched with dark. Lower parts yellowish-white; throat sometimes spotted with dark brown. Length of head and body 80 mm.; tail 140 mm.

Type-specimens examined in the British Museum.

Habitat: New Guinea (Milne Bay! (types of *L. milnense*). — Ferguson Island!; St. Aignan Island!, S. of Ferguson Island, d'Entrecasteaux Archipelago; Rossel Island!, Louisiade Archipelago.

### 28. *Lygosoma sanctum* Dum. & Bibr.

*Lygosoma sancta*, Dum. & Bibr., Erp. Gén. V 1839, p. 730.

*Lygosoma sanctum*, M. Weber, Zool. Ergebn. Reise N. O.-Ind. I 1890/91, p. 171, pl. XIV, fig. 4.

*Sphenomorphus sanctus*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 90.

Snout rather short; lower eyelid scaly; ear-opening oval,



smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter as long as frontoparietals and parietals together, in contact with the three anterior supraoculars; five large supraoculars, first longer than second, last smallest; nine supraciliaries; supraocular region swollen; frontoparietals a little larger than the interparietal; parietals in contact; no nuchals; fifth and sixth upper labials largest and below the eye. Body with 32—34 finely striated scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one fifth in that between axilla and groin; praeanales enlarged. Tail about one time and a half the length of head and body. Limbs strong, the hind limb reaches the axilla; digits long, compressed, fourth toe with 25—30 keeled lamellae below.

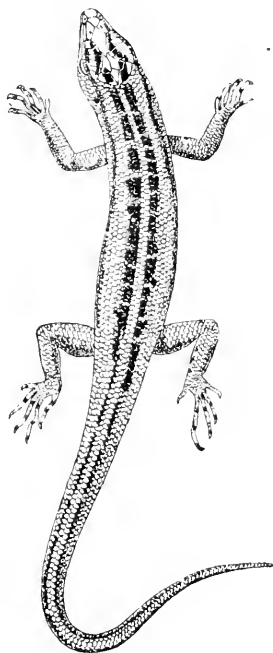


Fig. 73. *Lygosoma sanctum* D.B.  
(After Max Weber).

Light brown above with a silvery-white vertebral band, beginning on the forehead and edged on each side by a black, white-spotted streak; a black lateral band from the nostril through the eye to the groin, spotted with whitish. Lower parts greenish or white. Length of head and body 48 mm.; tail 68 mm.

Habitat: Sumatra; Java (Gadok, Buitenzorg!, Babakan!, Nusa Kambangan!, Dirk de Vries Bay!, Pengalengan 4000 feet, Tengger Mts. 1200 M.). — Malacca (Selangor, 1500 feet).

## 29. *Lygosoma striolatum* M. Weber.

*Lygosoma striolatum*, M. Weber, Zool. Ergebn. Reise N. O. Indien I 1890/91, p. 172, pl. XIV fig. 5, 6.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with

the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the

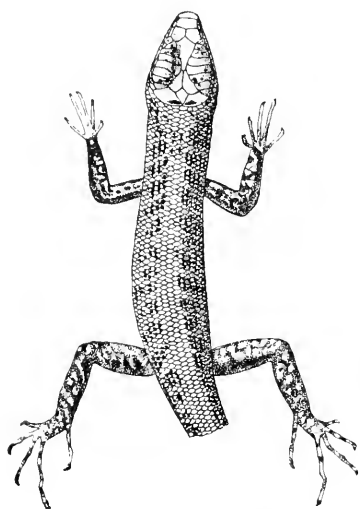


Fig. 74. *Lygosoma striolatum* M. Web.  
(After Max Weber).

four anterior supraoculars; seven supraoculars, first longer than second, last very small; ten supraciliaries, first largest; frontoparietal and interparietal equal; parietals in contact; no nuchals; fifth and sixth upper labials largest and below the eye. Body with 40 (42) finely striated scales round the middle, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one fifth in that between axilla and groin; praeanales enlarged. Limbs strong, the hind limb reaches the ear; digits long, compressed, fourth toe with 26 keeled lamellae below.

Pale brown above, with strong metallic gloss and small dark spots in short longitudinal series; a dark loreal streak; edge of lips blackish. Lower parts white. Length of head and body 50 mm.; tail 74 mm.

Type-specimen examined in the Amsterdam Museum.

Habitat: Flores!; Damma Island.

### 30. *Lygosoma kühnei* Roux.

*Lygosoma (Hinulia) Kühnei*, Roux, Abh. Senck. Ges. XXXIII 1910, p. 237, Taf. XIII, fig. 2.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, as large as the eye, no lobules. Nostril in the nasal; no supranasals; rostral broad; one anterior loreal; frontonasal more than twice as broad as long, in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the four anterior supraoculars; seven supraoculars, first longest; eleven supraciliaries, first largest; frontoparietals and interparietal equal; parietals in contact; no nuchals; fifth upper labial largest and below the eye. Body with 42 smooth scales round the middle,

dorsals broadest, laterals small; the distance between the tip of the snout and the fore limb is contained a little more than one time in that between axilla and groin; praeanales enlarged. Tail one time and three fourths the length of head and body. Limbs strong, the hind limb reaches the shoulder; digits long, compressed, fourth toe with 34 smooth lamellae, the seven basal ones double, the others single.

Brown above, with dark spots in two dorso-lateral series; these spots forming zig-zag lines in the middle of the body; sides black on the anterior part of the body, posteriorly grey, black-spotted, tail brownish-grey with dark spots; limbs brown above, dark-spotted, grey below. Lower parts yellowish-grey, spotted with dark grey; throat black; sometimes the mental shield light grey. Of young specimens the sides have a lighter colour, greyish with large white spots, beginning below the eye; a black dorso-lateral line. Length of head and body 70 mm.; tail 120 mm. (After Roux, not seen by me).

Habitat: Kei Islands.

### 31. *Lygosoma melanopogon* Dum. & Bibr.

*Lygosoma melanopogon*, part., Dum. & Bibr., Erp. Gén. V 1839, p. 723.

*Lygosoma melanopogon*, Boulenger, Cat. Liz. III 1887, p. 244 (s. syn.).

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, almost as large as the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal at least twice as broad as long, broadly in contact with the large rostral; praefrontals forming a suture, sometimes a small azygos shield between them; frontal as long as frontoparietals and interparietal together, in contact with the three anterior supraoculars; six or seven supraoculars, first twice as long as second; eleven supra-ciliaries; frontoparietals and interparietal subequal; parietals in contact; usually no nuchals; fifth or sixth upper labial largest and below the eye. Body with 44—55 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and two fifths to one time and a half in that between axilla and groin; praeanales enlarged. Tail nearly one time and a half the length of head and body. Limbs strong, the hind limb reaches the elbow or beyond; digits compressed, fourth toe with 17—19 keeled lamellae below.

Brown above, with dark brown cross bands or network, the spots largest on the sides of the neck. Lower parts yellowish or brownish; throat sometimes with brown longitudinal lines. Length of head and body 90 mm.; tail 118 mm.

*Habitat*: Celebes (Manado!); Aru Islands!; Goram; Salawatti; New Guinea! (Mafoor, Jobi, Dorei, Mansinam, Andai, Hatam, Mt. Arfak, Sorong, Passim, Rubi, Humboldt Bay, Ramoi, Kolokadi, Kapaor, Mt. Epa, Mimika river, Stekwa river, Fly river); Schouten Islands (Mysore).

### 32. *Lygosoma nigrilabre* Günther.

*Hinulia nigrilabris*, Günther, Proc. Zool. Soc. 1873, p. 166, pl. XVII fig. A.

*Lygosoma nigrilabre*, Boulenger, Cat. Liz. III 1887, p. 245.

*Lygosoma amabile*, F. Müller, Verh. Ges. Basel X 1895, p. 837.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals; frontonasal twice as broad as long, in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the three anterior supraoculars; six supraoculars, first more than twice as long as second; eleven supraciliaries; frontoparietals longer than interparietal; parietals in contact; no nuchals; fourth and fifth or fifth and sixth labials below the eye. Body with 40—50 scales round the middle, laterals smallest, dorsals largest, keeled; the distance between the tip of the snout and the fore limb is contained one time and one fifth in that between axilla and groin; praeanal enlarged. Tail one time and a half the length of head and body. Limbs strong, the hind limb reaches the shoulder, digits slender, compressed, fourth toe with 20—27 keeled lamellae below.

Light brown above, with irregular dark brown spots; a dark brown dorso-lateral band spotted with yellowish, beginning at the nostril; flanks spotted with brown; upper lip whitish, edged with blackish-brown; limbs dark-spotted. Lower parts yellowish; throat sometimes black-spotted. Length of head and body 95 mm.; tail 140 mm.

*Nom. indig.* Ulowa (Toradja name).

*Habitat*: Celebes (Manado, Posso!, Klabat Volcano, Sudara Volcano, Tomohon, Matinang Mts. 2600 feet, Luhu 1000—1600 feet, Masarang Range!, Sadaonta, Tuwa, Mapane, Bua Praeng).

33. *Lygosoma tropidonotus* Boulenger.

*Lygosoma tropidonotus*, Boulenger, Proc. Zool. Soc. London 1897, p. 208, pl. X, fig. 2.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals, separated from the lower praeocular by a third loreal; fronto-nasal nearly twice as broad as long, forming a suture with the rostral and with the frontal; latter twice as long as broad, narrowed behind, in contact with the three anterior supraoculars; six supraoculars, first nearly twice as long as second; ten supraciliaries; frontoparietals and interparietal subequal; parietals in contact; nuchal present on one side; fourth to sixth upper labials below the eye. Body with 42—44 scales round the middle, laterals smallest, dorsals and laterals strongly keeled; the distance between the tip of the snout and the fore limb is contained one time and one fifth in that between axilla and groin; praeanales enlarged. Limbs strong, the hind limb reaches a little beyond the shoulder; digits long, compressed, fourth toe with 27 keeled lamellae below.

Blackish-brown above, with irregular transverse series of small round, yellowish-white spots; sides of head and neck with yellowish-white vertical bars; limbs and tail with light cross bars. Lower parts brownish-white. Length of head and body 61 mm.; tail (reproduced) 57 mm. (After Boulenger, not seen by me).

Habitat: Celebes (Luhu 1200 feet); Buton.

34. *Lygosoma simum* Sauvage.

*Lygosoma (Hinulia) sima*, Sauvage, Bull. Soc. Philom. (7) III 1879, p. 54.  
*Lygosoma simum*, Boulenger, Cat. Liz. III 1887, p. 245.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, almost as large as the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals; fronto-nasal twice as broad as long, in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and parietals together, in contact with the three anterior supraoculars; six supraoculars, first more than twice as long as second; twelve supraciliaries; frontoparietals larger than the interparietal; parietals in contact; no nuchals; fifth and sixth

upper labials below the eye. Body with 40 scales round the middle, dorsals largest, keeled, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and two fifths in that between axilla and groin; præanals enlarged. Tail not quite twice the length of head and body. Limbs strong, the hind limb reaches halfway between the fore limb and the ear; digits long, compressed; fourth toe with 25 keeled lamellae below.

Brown above, with yellowish and blackish transverse spots; flanks variegated with black; lips black-spotted. Lower parts yellowish. Length of head and body 56 mm.; tail 105 mm. Not seen by me).

Habitat: New Guinea (Mafoor).

### 35. *Lygosoma anomalopus* Boulenger.

*Lygosoma anomalopus*, Boulenger, Proc. Zool. Soc. London 1890, p. 84, pl. XI fig. 4.  
(*Lygosoma paradoxum*, Werner, Verh. Ges. Wien XLVI 1896, p. 13, Taf. I fig. 3.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals; fronto-

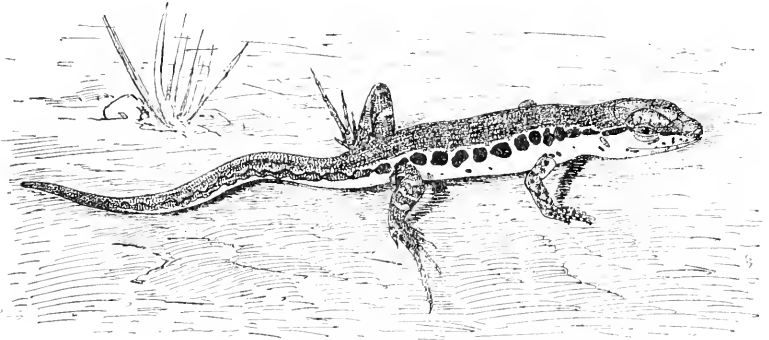


Fig. 75. *Lygosoma anomalopus* Blgr.

nasal more broad than long, broadly in contact with the flat rostral; præfrontals forming a suture; frontal as long as frontoparietals and parietals together, narrowed posteriorly, in contact with the three anterior supraoculars; five supraoculars, first and fourth largest; nine supraciliaries; frontoparietals and interparietal equal; parietals forming a suture; no nuchals; fifth and sixth or sixth and seventh upper labials below the eye. Body with 38 smooth scales round the middle, laterals smallest;

the distance between the tip of the snout and the fore limb is contained one time and one third in that between axilla and groin; praeanal strongly enlarged. Limbs strong, the hind limb reaches the eye; digits moderate, toes very unequal in length, compressed; fourth toe half as long as the distance between axilla and groin, with 16—18 keeled lamellae below; first and fifth very short; the subarticular lamellae much enlarged.

Brown above, with pale reddish-brown cross bands; a blackish lateral streak, beginning at the rostral and sometimes broken up into spots on the posterior part of the body by the light transverse bands and a series of white spots on the flanks, sometimes bordered towards the belly by an indistinct dark streak; labial sutures brownish. Lower parts white, sometimes a series of small black spots along each side of the belly. Length of head and body 70 mm.; tail reproduced.

Habitat: Nias!; Sumatra (Bandar Kwala, Deli). — Pinang.

### 36. *Lygosoma jobiense* Meyer.

*Lygosoma (Hinulia) jobiensis*, Meyer, Mon. Berl. Ac. 1874, p. 131.

*Lygosoma jobiense*, Boulenger, Cat. Liz. III 1887, p. 247.

*Sphenomorphus jobiensis*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 90.

Snout short, obtuse; lower eyelid scaly; ear-opening large, oval, slightly smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals; frontonasal more broad than long, in contact with the rostral, which is long and rounded behind; praefrontals usually forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the two or three anterior supraoculars; five supraoculars, first largest; ten to twelve supraciliaries; frontoparietals a little longer than the interparietal; parietals in contact; sometimes nuchals present; sixth or seventh upper labial below the eye. Body long, the distance between the tip of the snout and the fore limb is contained about one time and a half in that between axilla and groin; 38—46 smooth scales round the middle, dorsals largest, laterals smallest; praeanal enlarged. Tail about one time and a half the length of head and body. Limbs strong, the hind limb reaches the wrist or the elbow; digits compressed, fourth toe with 18—27 smooth or keeled lamellae below.

Brown above, uniform or with small blackish spots or irregular dark cross bands; a dorso-lateral series of light, black-edged ocelli may be present; flanks speckled with dark brown or with a broad black band from the eye to the hind limb, the upper border of the band wavy; a dark streak through the eye; sometimes three or five black spots on each side of the anterior part of the body, the first above the ear; lips spotted with brown; limbs dark-spotted, soles greyish-brown, tail with a series of pale spots on each side, bordered with black. Lower parts yellowish; throat sometimes with brown spots or lines. Length of head and body 116 mm.; tail 183 mm.

Habitat: Aru Islands; Salawatti!; New Guinea (Jobi, Djamna, Manokwari!, Sermowai river!, Koimé river!, Kaiserin-Augusta river!, Humboldt Bay, Lorentz river!, Mimika river, Stekwa river, Fly river, Bara Bara, Vikaiku, St. Joseph river, Mt. Victoria, Haveri, Moroka 2300 feet, Friedrich Wilhelmshafen, Berlinhafen, Erima, Oertzen Mts., Astrolabe Bay!; Valise Island).—Ferguson Island; Trobriand Island; Bismarck Archipelago.

The egg is cylindrical, whitish and measures 19—20 mm. by 9.5—11 mm.

### 37. *Lygosoma variegatum* Peters.

*Lygosoma (Hinulia) variegatum*, Peters, Mon. Berl. Ac. 1867, p. 20.

*Lygosoma variegatum*, Boulenger, Cat. Liz. III 1887, p. 246 (s. syn.).

*Lygosoma kinabaluensis?*, Bartlett, Crocod. Liz. Borneo Sarawak Mus. 1895, p. 94.

*Sphenomorphus variegatus*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 90.

Snout short, obtuse; lower eyelid scaly; supraocular region swollen; ear-opening large, oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed anterior loreals; frontonasal twice as broad as long or broader, broadly in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and parietals together or shorter, in contact with the three anterior supraoculars; six to eight supraoculars, first twice as long as second; twelve or thirteen supraciliaries; frontoparietals a little longer than the interparietal; parietals in contact; no nuchals; fifth or sixth upper labial below the eye. Body with 38 or 40 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time to one and a third time in



that between axilla and groin; praeanals enlarged. Tail one time and a half the length of head and body. Limbs strong, the hind limb reaches the axilla or beyond; digits long, compressed, fourth toe with 20—25 smooth or slightly keeled lamellae below.

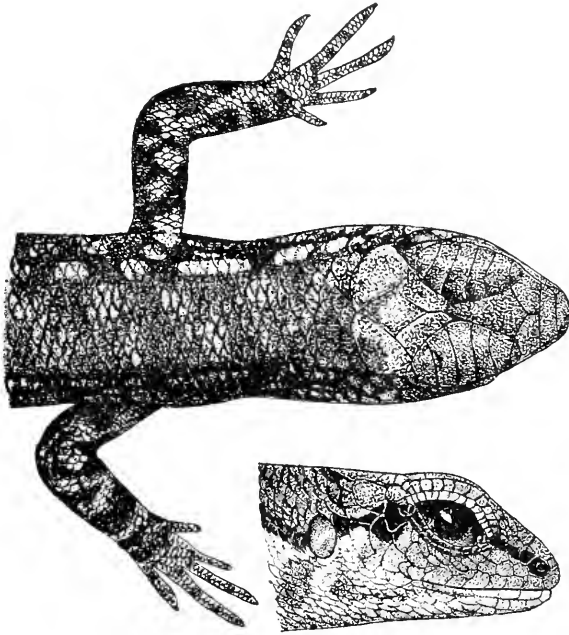


Fig. 76. *Lygosoma variegatum* Peters.

Brown above, spotted with lighter and blackish-brown; a dorso-lateral series of light spots often present, bordered below by a blackish band, spotted with light. Lower parts yellowish or brownish, throat of males sometimes blue; palms and soles brown. Length of head and body 55 mm.; tail 84 mm.

Habitat: Borneo (Sarawak, Kuching, Balingeau, Mt. Dulit 1500 feet, Kina Balu!); Celebes (Bonthain Peak 4400 feet, Indrulaman, Bantimurong!, Loka 3500 feet!, Rumbi-Mengkoka); Timor!; Halmahera; Waigeu!; New Guinea (Jobi, Ron, Mafoor, Mios Korwar!, Sorong, Manokwari, Mansinam, Jamur river!, Sermowai river!, Koimé river!, Jaona!, Lake Sentani!, Humboldt Bay!, Lorentz river!, Mimika river, Stekwa river, Utakwa river 2500 feet, Etna Bay!, Haveri); Schouten Islands (Mysore); Aru Islands. — Philippines; Bismarck Archipelago.

38. *Lygosoma sarasinorum* Boulenger.

*Lygosoma sarasinorum*, Boulenger, Proc. Zool. Soc. London 1897, p. 210, pl. X fig. 2.

Snout short, obtuse; supraocular region swollen; lower eyelid scaly; ear-opening large, oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; two superposed loreals behind the nasal; frontonasal twice as broad as long, in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the three or four anterior supraoculars; seven or eight supraoculars; twelve to fifteen supraciliaries; frontoparietals and interparietal subequal; parietals in contact; no nuchals; fifth and sixth or fourth to sixth upper labials below the eye. Body with 44 or 46 smooth scales round the middle, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one sixth to one time and one third in that between axilla and groin; prae-anals enlarged. Tail more than twice as long as head and body. Limbs strong, the hind limb reaches the shoulder or beyond; digits long, compressed, fourth toe with 22—24 keeled lamellae below.

Brown above, with small dark spots and wavy yellowish-brown cross bars; a dorso-lateral series of small light spots; limbs with dark bands; a black stripe on each side of the body beginning anteriorly to the hind limb and continued along the base of the tail, bordered above by a yellowish streak or a series of yellowish spots; base of hind limb with a blackish band posteriorly. Lower parts yellowish-white. Length of head and body 76 mm.; tail 160 mm.

Type-specimen examined in the British Museum.

Habitat: Celebes (Bontorio, Luhu 650 feet!).

Section *Keneuxia* Gray (fig. 77).

Lower eyelid scaly; ear-opening small; supranasals present or absent. Frontal not broader than the supraocular region; frontoparietals distinct. Prae-anals not or feebly enlarged. Limbs strong, pentadactyle, overlapping when adpressed; digits compressed distally.

## Key to the Indo-Australian species.

A. No supranasals; an enlarged scale on the heel . 39. *L. smaragdinum* p. 199.

B. Supranasals present.

1. Dorsal scales smooth.

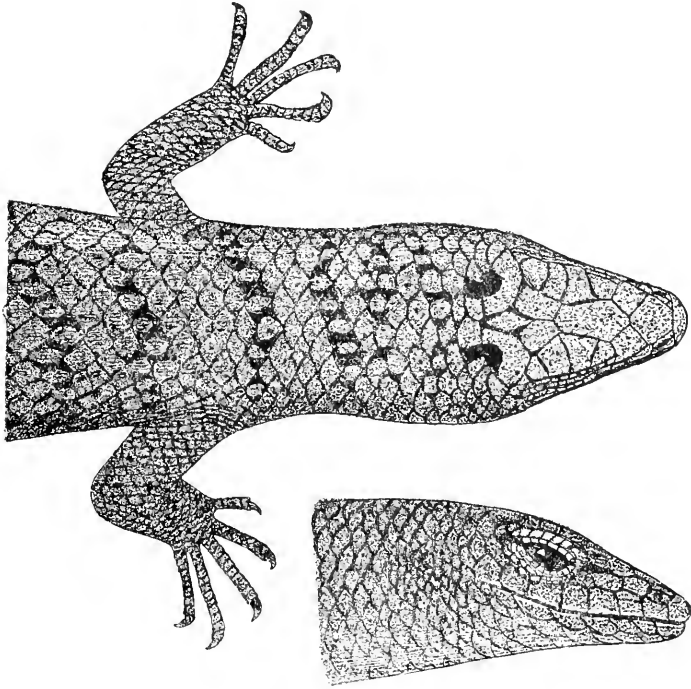


Fig. 77. Section *Keneuxia*. *Lygosoma olivaceum* (Gray).

a. 21—22 scales round the body; frontal as long as frontoparietal and interparietal together . . . . . 40. *L. zyneri* p. 202.

b. 24 scales round the body; frontal shorter than frontoparietal and parietal together . . . 41. *L. newenhuisi* p. 202.

II. Dorsal scales keeled.

1. Nuchal scales smooth or slightly keeled . . . 42. *L. olivaceum* p. 203.

2. Nuchal scales strongly keeled . . . . . 43. *L. vittatum* p. 205.

### 39. *Lygosoma smaragdinum* (Lesson).

*Scincus smaragdinus*, Lesson, Voy. Coquille Zool. II 1830, p. 43, pl. III fig. 1.

*Lygosoma smaragdinum*, Boulenger, Cat. Liz. III 1887, p. 250.

*Lygosoma acutirostre*, Oudemans, in Semons Zool. Fors. Austr. Bd. 5 1894, p. 141.

*Dasia smaragdinum*, Barbour, Proc. Biol. Soc. Wash. XXIV 1911, p. 16; Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 91, pl. 1 & 2.

Snout long and pointed, depressed; lower eyelid scaly;

ear-opening small, with or without one or two small lobules anteriorly. Nostril in the nasal, or between a nasal and a postnasal; no supranasals; frontonasal as long as broad or more broad than long, broadly in contact with the rostral and sometimes with the frontal; latter as long as frontoparietal and parietal together or longer still, in contact with the three anterior supraoculars; four supraoculars; numerous supracilia-ries; frontoparietals much larger than the interparietal; parietals in contact behind the latter, sometimes separated by the interparietal; one to three pair of nuchals and a pair of large temporals; five to seven upper labials before the subocular. Body strong, the distance between the tip of the snout and the fore limb is contained about one time and one third in that between axilla and groin; 20—26 scales round the middle, the two vertebral series largest, all smooth or dorsals with four low keels; prae-anals not or feebly enlarged. Tail one and one third time to two times the length of head and body. Limbs strong, the hind limb reaches the elbow or the axil; digits slender, strongly compressed distally, fourth toe with 28—35 smooth lamellae below. Heel with a large roundish or oval scale.

Green, blue, olive or brown above, with or without dark and light spots and dark edges to the scales; sometimes a light lateral band. Lower parts yellowish or greenish. Length of head and body 103 mm.; tail 156 mm.

Nom indig. Ulowa (Toradja-name).

Habitat: Java; Borneo (Sandakan Bay!); Celebes (Manado!, Minahassa, Posso!, Buol!, Mapane!, Pare Pare, Sakedi, Macassar); Saleyer!; Lombok!; Sumba!; Savu!; Rotti!; Timor!; Flores!; Ombaai!; Damma!; Wetar; Timor Laut!; Kei Islands!; Ambon!; Ceram!; Obi; Ternate!; Halmahera!; Morotai!; Misol!; Batjan!; Salawatti; Waigeu!; New Guinea (Mafoor, Jobi, Manaswari!, Dorei, Mansinam, Sorong, Fak Fak!, Manokwari!, Tami river!; Mawes!, Sermowai river!, Jakari!, Tanah Merah Bay!, Humboldt Bay!, lake Sentani!, Mimika river!, Bongu, Bogadjim, Astrolabe Bay!, Friedrich-Wilhelmshafen, Berlinhafen, Five Bay, Aroma, Bara Bara!); Valise and Tumbler Islands; Schouten Islands (Mysore). — Pelew Islands; Philip-pines; Formosa; Trobriand Island; Ferguson Island; Bismarck Archipelago; Solomon Islands; Duke of York Island; Admiralty, Caroline and Marshall Islands; Santa Cruz.

The eggs are laid under the barks of trees; they measure

21 by 10 mm. and are white with five longitudinal grooves.

*Lygosoma smaragdinum* varies considerably in coloration; at least four distinct geographic forms may be observed, three of which have been described and figured by Barbour (Op. cit.).

a. *celebensis* subsp. nov.

Pale olive or greenish above, with two or four longitudinal series of large dark brown or black blotches on the back. An indistinct lighter or yellowish dorso-lateral streak posteriorly. (See Boulenger, Proc. Zool. Soc. London 1897, p. 212).

Borneo (Sandakan Bay!); Celebes (Posso!); Saleyer! (type of *L. acutirostre* Oud.).

b. *moluccarum* Barbour.

*Dasia smaragdinum moluccarum*, Barbour, op. cit.

Greyish-brown above, sometimes with a greenish tint anteriorly, with or without small black spots, often preceded by light ones. A greenish dorso-lateral streak (See Boettger, Abh. Senckenb. Ges. XXV 1900, p. 339 and Nelly de Rooy, Bijdr. Dierk. XIX 1913, p. 23).

Celebes!; Ternate!; Halmahera!; Obi; Misol!; Kei Islands!; Ceram!; Ambon!; Flores!; Rotti!; Alor!; Damma!; Timor Laut!. — Philippines!.

c. *smaragdinum* (Less.).

*Scincus smaragdinus*, Lesson, Voyage Coquille Zool. II 1830, p. 43, pl. III fig. 1.

*Dasia smaragdinum smaragdinum*, Barbour, op. cit.

Green above, the green colour fading on the posterior part of the body to brown, which is sometimes spotted with black and whitish (see Werner, Mitt. Zool. Samml. Berlin I 1900, p. 56; Nelly de Rooy, Nova Guinea Zool. V 1909, p. 378 and Bydr. Dierk. 19 1913, p. 23).

Misol!; Waigeu!; New Guinea (Fak Fak!, Manaswari!, Manokwari!, Tami river!, Mawes!, Lake Sentani!, Sermowai river!, Jakari!, Tanah Merah Bay!, Humboldt Bay!, Astrolabe Bay!, Mimika river!, Bara Bara!). — Trobriand Island!; Solomon Islands!; Bismarck Archipelago; Admiralty Islands!.

d. *viridipunctum* (Lesson).

*Scincus viridipunctus*, Lesson, Voyage Coquille Zool. II 1830, p. 44, pl. IV fig. 1.

*Dasia smaragdinum viridipunctum*, Barbour, op. cit.

Blackish-grey or dark bluish-grey above, the scales black-

edged or with a black centre. (See Werner, Mitt. Zool. Samml. Berlin I 1900, p. 57).

Pelew Islands!; Marshall and Caroline Islands! (Ponapé!).

#### 40. *Lygosoma vyneri* Shelford.

*Lygosoma vyneri*, Shelford, Ann. Nat. Hist. (7) XV 1905, p. 208.

Snout obtusely pointed, slightly depressed; lower eyelid scaly; ear-opening small. Nostril in the nasal; supranasals present, separated; frontonasal as broad as long, in contact with the rostral; frontal as long as the frontoparietals and parietals together, in contact with the two anterior supraoculars; five supraoculars, second largest, last very small; eight supraciliaries, first and second largest; frontoparietals a little shorter than the interparietal, which almost entirely separates the parietals; a pair of nuchals; four upper labials before the subocular. Body with 21—22 smooth scales round the middle, dorsals larger than ventrals; the distance between the tip of the snout and the fore limb is contained one time and one third in the distance between axilla and groin; praeanales feebly enlarged. Tail as long as head and body. Limbs strong, overlapping when adpressed; digits slender, compressed distally, fourth toe with 15—20 smooth lamellae below.

Olive-grey above with four longitudinal series of black-edged scales; some of the head-scales black-edged; sides of neck and body and limbs brown, each scale black-edged. Lower parts pale green. Length of head and body 66 mm.; tail 66 mm.

Habitat: Borneo (Mt. Balineau in Sarawak!, Upper-Mahakkam river!).

#### 41. *Lygosoma nieuwenhuisi* Lidth.

*Lygosoma Nieuwenhuisii*, van Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 195.

Snout long, pointed, depressed; lower eyelid scaly; ear-opening very small, with one lobule anteriorly. Nostril in the nasal; supranasals small, separated; frontonasal as long as broad, in contact with the rostral and narrowly with the frontal; latter shorter than frontoparietal and parietal together, in contact with the two anterior supraoculars; five supraoculars, second largest, last very small; frontoparietals shorter than the interparietal; parietals in contact behind the latter; a pair

of nuchals and two temporals on each side; fifth upper labial below the eye, twice as high as the fourth. Body with 24 smooth scales round the middle, the two vertebral series largest; the distance between the tip of the snout and the fore limb is contained one time and one fourth in the distance between axilla and groin; praeanal scales feebly enlarged. Tail (reproduced at tip) a little shorter than head and body. Limbs strong, the hind limb reaches the elbow; digits slender, strongly compressed distally, fourth toe with 18 smooth lamellae below, fourth and fifth lamellae longest.

Brown above with bluish gloss and black and bluish spots, a greyish-blue dorso-lateral streak beginning at the shoulder, continued on the tail; head-shields edged with blackish; tail with dark transverse bands above. Lower parts dark blue. Length of head and body 57 mm.; tail (reproduced) 55 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Long Bloel).

#### 42. *Lygosoma olivaceum* (Gray).

*Dasia olivacea*, Gray, Ann. Nat. Hist. II 1838, p. 331.

*Lygosoma olivaceum*, Boulenger, Cat. Liz. III 1887, p. 251 (s. syn.).

*Mabuia Saravacensis*, Bartlett, Crocod. Liz. Borneo 1895, p. 94.

*Dasia olivaceum*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV, 1912, p. 91.

Snout long, depressed; lower eyelid scaly; ear-opening very small. Nostril in the nasal; supranasals present, often separated; frontonasal more broad than long, frequently forming a suture with the rostral and with the frontal; latter as long as or slightly longer than frontoparietal and parietal together, in contact with the two or three anterior supraoculars; four supraoculars; seven or eight supraciliaries, first largest; frontoparietals as large as or a little larger than the interparietal, which separates the parietals; a pair of nuchals; four labials before the subocular. Body with 28—30 scales round the middle, dorsals and laterals with three to nine strong keels, nuchal scales smooth or feebly keeled, dorsals larger than ventrals; the distance between the tip of the snout and the fore limb is contained one time and a half in the distance between axilla and groin; praeanal not enlarged. Tail nearly one time and one third the length of head and body. Limbs strong, the hind limb reaches the wrist; digits moderate, strongly compressed distally, fourth toe with 17—20 smooth lamellae below.

Olive or brownish above, with transverse series of light, dark-edged spots; sometimes a light dorso-lateral band on the posterior part of the body and on the tail; sutures between

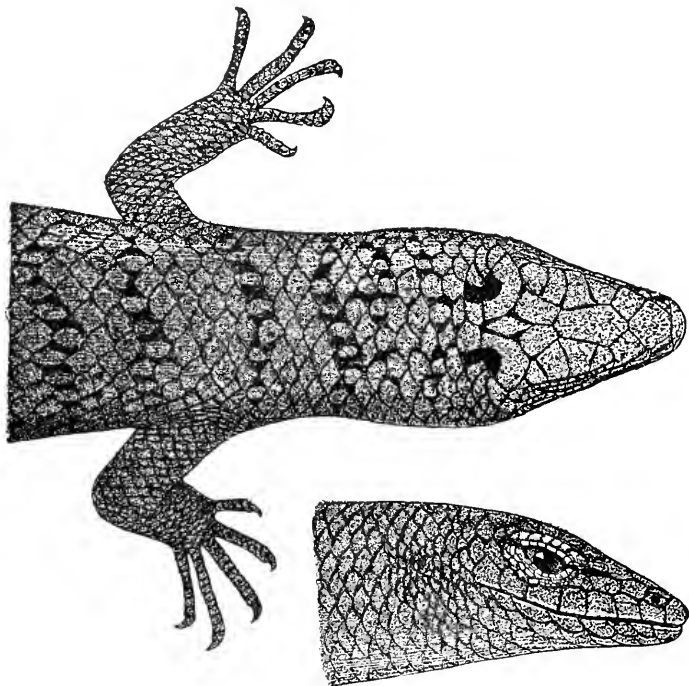


Fig. 78. *Lygosoma olivaceum* (Gray).

the head-shields black; a black spot on parietals and nuchals. Lower parts greenish. Young specimens have transverse bands of black alternating with narrow greenish ones; tail scarlet. Length of head and body 114 mm.; tail 131 mm.

Habitat: Simalur!; Nias!; Sumatra (Deli!, Langkat, Djambi!, Dawas in Palembang, Manindjau!, Gunung Sahilan!, Sidjundjung!, Padang!, Indrapura); Singkep; Natuna Islands; Borneo (Sandakan Bay!, Kina Balu, Sarawak, Balingeau, Kuching, Santubong, Smitau!, Nanga Raun!, Howong river!); Java (Gadok, Buitenzorg!, Semarang!, Mt. Pentae!, Tengger Mts. 1200 M.). — Malacca; Tenasserim; Nicobars; Andamans; Philippines.



43. *Lygosoma vittatum* (Edeling).

*Apterygodon vittatum*, Edeling, Nederl. Tijdschr. Dierk. II, 1864, p. 201.

*Lygosoma vittatum*, Boulenger, Cat. Liz. III 1887, p. 252 (s. syn.).

Snout short, obtuse; lower eyelid scaly; ear-opening oval, oblique, small. Nostril in the nasal; supranasals present; fronto-nasal more broad than long, forming a suture with the rostral and with the frontal; latter slightly longer than frontoparietal and parietal together, in contact with the two anterior supraoculars; five supraoculars, second largest, last very small; eight or nine supraciliaries, first largest; frontoparietals larger than the interparietal, which separates the parietals; sometimes distinct nuchals; four labials before the subocular. Body with 30 scales round the middle, dorsals and laterals with three or five strong keels, nuchal scales strongly keeled; the distance between the tip of the snout and the fore limb is contained one time and one fourth to one time and two thirds in the distance between axilla and groin; praeanales not enlarged. Tail longer than head and body. Limbs strong, the hind limb reaches the wrist or the elbow; digits moderate, flattened at the base, the distal part compressed, fourth toe with 17—20 smooth lamellae below.

Anterior part of body black; a light band from the rostral to the occiput and two others on each side, one beginning on the supraciliary border, the other below the eye; between the light bands are some pale dots; limbs and posterior part of body olive with small black and light spots. Lower parts greenish-white. Length of head and body 96 mm.; tail 108 mm.

**Habitat:** Borneo (Matang, Sintang!, Sarawak, Kuching, Baram river, Rejang river, Santubong, Buntok, Sandakan Bay!); Ceram? <sup>1)</sup>.

Section *Homolepida* Gray (fig. 79).

Lower eyelid scaly; tympanum distinct; no supranasals. Praefrontals well developed; frontal not broader than the supraocular region. Limbs short, pentadactyle, the hind limb

<sup>1)</sup> See Boulenger, Cat. Liz. III 1887, p. 253.

not longer than the distance between the anterior corner of the eye and the fore limb.

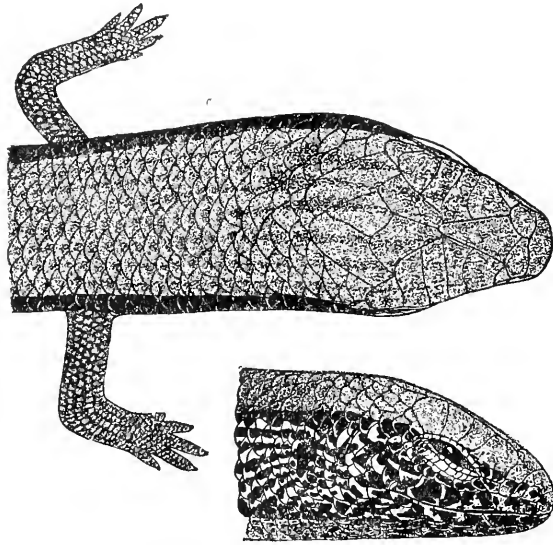


Fig. 79. Section *Homolepida*. *Lygosoma temmincki* D. B.

### Key to the Indo-Australian species.

*A.* Fourth toe longer than third.

I. Praeanal scales enlarged.

- a.* 24—26 scales round the body; 10 lamellae under the fourth toe. . . . . 44. *L. forbesi* p. 207.  
*b.* 22 scales round the body; 15—18 lamellae under the fourth toe. . . . . 45. *L. crassicauda* p. 207.  
*c.* 30 scales round the body; 15 lamellae under the fourth toe . . . . . 46. *L. unilineatum* p. 208.

II. Praeanals not enlarged.

1. 26 scales round the body; 12 lamellae under the fourth toe . . . . . 47. *L. alfredi* p. 209.  
 2. 40 scales round the body; 14 lamellae under the fourth toe . . . . . 48. *L. hallieri* p. 210.

*B.* Fourth toe not longer than third.

- a.* Ear slightly smaller than the eye-opening; 30—32 scales round the body; 10 lamellae under the fourth toe. . . . . 49. *L. temmincki* p. 210.  
*b.* Ear much smaller than the eye-opening; 30 scales round the body; 10 lamellae under the fourth toe. . . . . 50. *L. parvum* p. 212.

44. *Lygosoma forbesi* Boulenger.

*Lygosoma forbesii*, Boulenger, Ann. Nat. Hist. (6) I 1888, p. 343.

Snout very short, obtusely pointed; lower eyelid scaly; ear-opening round, slightly smaller than the eye-opening, without auricular lobules. Nostril in the nasal; no supranasal; fronto-nasal much more broad than long, in contact with the rostral and with the frontal; latter as long as the frontoparietals, not larger than the interparietal; four supraoculars; eight supraciliaries; parietals forming a suture; four pair of nuchals; first upper labial largest, fourth below the centre of the eye. Body long, the distance between the tip of the snout and the fore limb is contained one time and a half in the distance between axilla and groin; 24—26 smooth scales round the middle, the two vertebral series enlarged; prae-anals enlarged. Tail thick. Limbs short, widely separated when adpressed, hind limb as long as the distance between the corner of the mouth and the fore limb; digits very short, fourth toe longer than third, with 10 smooth lamellae below.

Brown above, spotted with black on the back; flanks with dark lines. Lower parts yellowish, throat with black spots. Length of head and body 59 mm.; tail 82 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Sogere 1750 feet!, Bara Bara!).

45. *Lygosoma crassicauda* A. Dum.

*Lygosoma crassicauda*, A. Duméril, Cat. Méth. Rept. 1851, p. 172.

*Lygosoma crassicauda*, Boulenger, Cat. Liz. III 1887, p. 325 (s. syn.).

Snout conical; lower eyelid scaly; ear-opening round, small, much larger than the nostril. Nostril in the nasal; no supranasal; fronto-nasal more broad than long, narrowly in contact with the rostral and with the frontal; latter shorter than frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, second largest; six or seven supraciliaries; frontoparietals frequently shorter than the interparietal; parietals in contact behind the latter; four pair of nuchals; fourth or fifth upper labial below the centre of the eye. Body very long; the distance between the tip of the snout and the fore limb is contained two times to two times and a half in the distance between axilla and groin; 22 smooth scales round the middle, dorsals largest; prae-anals enlarged.

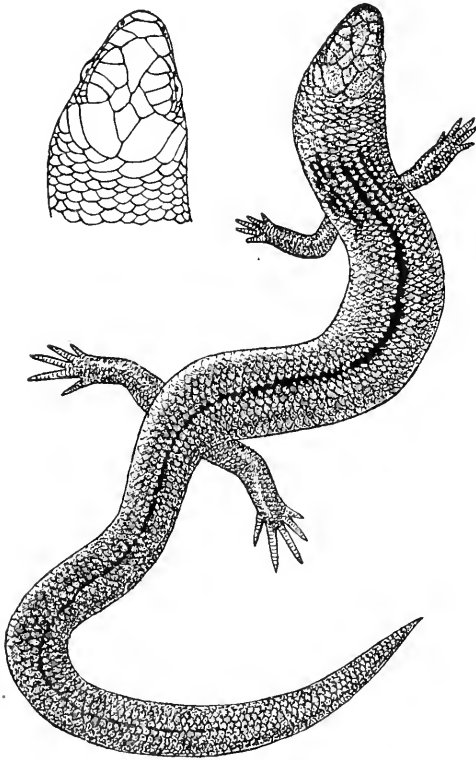
Tail thick, nearly twice as long as head and body. Limbs very short, the hind limb as long as the distance between the centre of the eye and the fore limb; digits short, fourth toe longer than third, with 15—18 smooth lamellae below.

Light brown or golden above, with a black streak or two series of black dots along the vertebral line; flanks dark brown or blackish, with or without numerous whitish spots. Lower parts yellowish or light brown, uniform or black-spotted. Length of head and body 46 mm.; tail 80 mm.

*Habitat*: New Guinea (Fly river!, Aroma!, Inawi, Kelesi).—Islands of Torres Straits; Queensland.

46. *Lygosoma unilineatum* n. sp.

Snout obtuse; lower eyelid scaly; ear-opening oval, smaller



than the eye-opening, with five obtusely pointed lobules anteriorly. Nostril in the nasal; no supranasal; frontonasal about twice as broad as long, broadly in contact with the rostral, narrowly with the frontal; latter as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first and second larger than the rest; seven or eight supraciliaries; frontoparietals as long as the interparietal; parietals in contact; a pair of nuchals and a pair of temporals; fifth upper labial below the eye. Body long; the

Fig. 80. *Lygosoma unilineatum* n. sp.

distance between the tip of the snout and the fore limb is

contained one time and a half to one time and two thirds in that between axilla and groin; 30 smooth scales round the middle, dorsals largest; prae-anals enlarged. Tail thick, one time and two thirds as long as head and body. Limbs short, widely separated when adpressed; digits short, fourth toe longer than third, with 15 smooth lamellae below.

Brown above, with a blackish vertebral line, continued on the tail; on the anterior part of the body a few pale brown transverse bands bordered with black. Lips with blackish oblique bars, continued on the throat, where they form V-shaped figures; the outer line may be extended along each side of the belly; flanks and sides of tail brown-spotted. Lower parts yellowish. Length of head and body 92 mm.; tail (tip reproduced) 110 mm.

Habitat: New Guinea (Tanah Merah Bay!).

#### 47. *Lygosoma alfredi* Boulenger.

*Lygosoma alfredi*, Boulenger, Proc. Zool. Soc. London 1898, p. 922, pl. LV fig. 4.

Snout short, obtuse; lower eyelid scaly; ear-opening round, almost as large as the eye-opening. Nostril in the nasal, frontonasal more broad than long, broadly in contact with the rostral and narrowly with the frontal; latter twice as long as broad, as long as the frontoparietals and interparietal together, in contact with the first and second supraoculars; four supraoculars; eight supraciliaries; frontoparietals distinct, somewhat larger than the interparietal; parietals in contact behind the latter; no nuchals; fourth to sixth upper labials below the eye. Body long; the distance between the end of the snout and the fore limb is contained one time and three fifths in the distance between axilla and groin; 26 smooth equal scales round the middle of the body, prae-anals not enlarged. Tail thick, slightly longer than head and body. Limbs short, hind limb as long as the distance between the centre of the eye and the fore limb; digits short, fourth toe slightly longer than third, with 12 smooth lamellae below.

Reddish-brown above, with dark spots on the nape; a dark lateral streak, passing through the eye, and formed by blackish spots. Lower parts whitish; throat and tail spotted with brown. Length of head and body 33 mm.; tail 35 mm.

Type-specimen examined in the British Museum.  
Habitat: N. Borneo (Sawa!)<sup>1</sup>).

48. *Lygosoma hallieri* Lidth.

*Lygosoma hallieri*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 197.

Snout short, obtuse; lower eyelid scaly; ear-opening roundish, large, smaller than the eye-opening. Nostril in the nasal; no supranasal; frontonasal more broad than long, broadly in contact with the rostral; praefrontals forming a suture; frontal as long as frontoparietals and interparietal together, in contact with the first and second supraoculars; four supraoculars; nine supraciliaries; frontoparietals and interparietal distinct, latter smallest, lozenge-shaped; parietals in contact behind the interparietal; no nuchals; third to fifth upper labials below the centre of the eye, from which they are separated by a series of scales. Body long; the distance between the end of the snout and the fore limb is contained one time and a half in the distance between axilla and groin; 40 smooth scales round the body, ventrals largest; praeanals not enlarged. Tail thick, about one time and a half as long as head and body. Limbs short, nearly meeting when adpressed; the hind limb as long as the distance between the anterior corner of the eye and the fore limb; digits short, fourth toe longer than third, with 14 lamellae below.

Brown above; flanks with irregular light spots; a dark brown lateral streak, white-spotted. Lower parts whitish. Length of head and body 37 mm.; tail 58 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Putus Sibau!).

49. *Lygosoma temminckii* D. & B.

*Lygosoma temminckii*, Dum. & Bibr., Erp. Gén. V 1839, p. 727.

*Lygosoma temminckii*, Boulenger, Cat. Liz. III 1887, p. 321.

*Homolepida temminckii*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, 95.

Snout short; lower eyelid scaly; ear-opening roundish or oval, smaller than the eye-opening. Nostril in the nasal; no

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1) Erroneously printed as *Sawa* in Boulenger's description.

supranasal; frontonasal more broad than long, broadly in contact with the rostral; praefrontals separated or in contact; frontal shorter than frontoparietals and interparietal together, in contact with the first and second supraoculars; four supraoculars; ten supraciliaries; frontoparietals and interparietal distinct, almost equal; parietals in contact behind the latter; no nuchals; third, fourth and fifth upper labials below the eye, which is

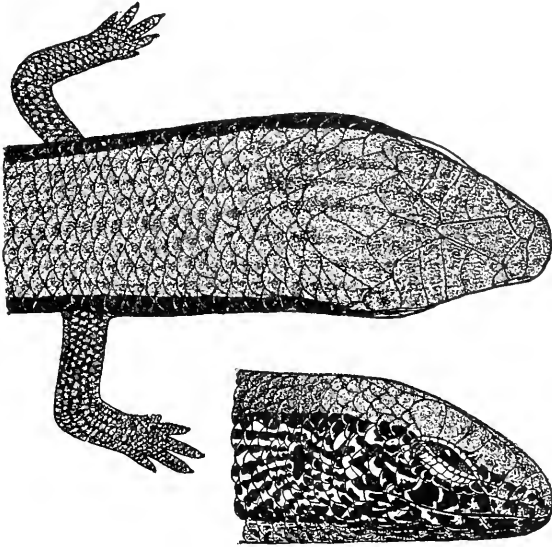


Fig. 81. *Lygosoma temmincki* D. B. Specimen with the praefrontals forming a suture.

bordered below by a series of scales. Body long, the distance between the tip of the snout and the fore limb is contained one time and two thirds in the distance between axilla and groin; 30—32 smooth scales round the middle, ventrals largest; praeanales very slightly enlarged. Tail thick, about one time and a half the length of head and body. Limbs short, the hind limb as long as the distance between the centre of the eye and the fore limb; digits short, round, fourth toe not longer than third, with 10 smooth lamellae below.

Brown above, with a blackish dorso-lateral streak. Lower parts yellowish; tail with blackish spots. Length of head and body 54 mm.; tail 74 mm.

Habitat: Sumatra (Deli, Palembang, Gunung Sahilan!,

Padang!); Java (Batavia, Buitenzorg, Tjidobas 1425 M.!; Gunung Gedeh 2000 M.!, Garut, Gunung Sewu!, Pengalenga 4000 feet, Tengger Mts. 1200 M.); Samao!; Celebes (Masarang); Buton.

#### 50. *Lygosoma parvum* Boulenger.

*Lygosoma parvum*, Boulenger, Proc. Zool. Soc. London 1897, p. 215, pl. XI fig. 4.

Snout short, obtuse; lower eyelid scaly; ear-opening roundish, much smaller than the eye-opening, without auricular lobules. Nostril in the nasal; no supranasal; frontonasal as broad as long, broadly in contact with the frontal; praefrontals forming a suture; frontal almost as long as frontoparietals and interparietal together, in contact with the first and second supraoculars; four supraoculars; eight supraciliaries; frontoparietals and interparietal distinct, latter somewhat smaller than former; parietals in contact behind the interparietal; no enlarged nuchals; third to fifth upper labials below the eye, from which they are separated by a series of scales. Body long; the distance between the end of the snout and the fore limb is contained one time and two thirds in the distance between axilla and groin; 30 smooth scales round the body, ventrals largest; praeanals slightly enlarged. Tail slightly longer than head and body, tapering to a fine point. Limbs short; the hind limb as long as the distance between the centre of the eye and the fore limb; digits short, fourth toe not longer than third, with 10 smooth lamellae below.

Dark brown above; flanks with yellowish-brown dots. Lower parts pale brown. Length of head and body 36 mm.; tail 42 mm. (After Boulenger, not seen by me).

Habitat: Celebes (Luhu 1000—1600 feet).

#### Section *Lygosoma* Gray (fig. 82).

Lower eyelid scaly; ear-opening distinct or absent; no supranasals. Praefrontals usually small and widely separated; frontal broader than the supraocular region. Limbs short, rudimentary or absent.

*Lygosoma jeudei*, *loriae*, *longicauda* and *nigriventre* connect this section with *Himulia*: they have rather large praefrontals which form a suture.



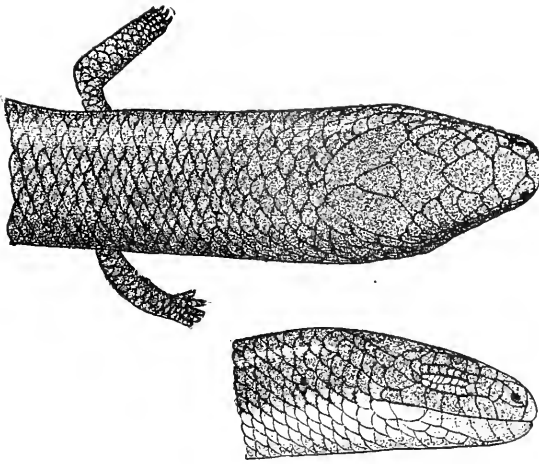


Fig. 82. Section *Lygosoma*. *Lygosoma chalcides* (L.).

### Key to the Indo-Australian species.

A. Limbs pentadactyle; ear distinct.

I. Two frontoparietals.

a. Four supraoculars.

1. No nuchals at all or one pair, feebly enlarged.

aa. 30 scales round the body; 16—20 lamellae under the fourth toe . . . 51. *L. nigriventre* p. 214.

bb. 30—32 scales round the body; 16—17 lamellae under the fourth toe; blackish-brown above, vermiculated with yellowish-brown . . . . . 52. *L. loriae* p. 215.

cc. 32 scales round the body; 17 lamellae under the fourth toe; dark brown above . . . . . 53. *L. wollastoni* p. 216.

dd. 36 scales round the body; 13—14 lamellae under the fourth toe; body vermiculated with dark brown . . . 54. *L. pratti* p. 217.

ee. 34—38 scales round the body; 14 lamellae under the fourth toe; body with 7 or 9 dark longitudinal lines 55. *L. neuhaussi* p. 217.

2. Three to six pair of nuchals.

a. 24 scales round the body; 12—13 lamellae under the fourth toe . . . 56. *L. oligolepis* p. 218.

b. 24—26 scales round the body; 15—17 lamellae under the fourth toe . . 57. *L. solomonis* p. 219.

- c. 28 scales round the body; 18—20 lamellae under the fourth toe . . . . 58. *L. longicaudatum* p. 220.
- d. 28—30 scales round the body; 14—16 lamellae under the fourth toe . . 59. *L. brevipes* p. 221.
- b. Five or more supraoculars.
1. 34 scales round the body; praefrontals separated; five supraoculars; one or two pair of nuchals; 18—20 lamellae under the fourth toe. . . . . 60. *L. mülleri* p. 222.
  2. 34 scales round the body; praefrontals forming a suture; five supraoculars; no nuchals; 18 lamellae under the fourth toe . . . . . 61. *L. jendei* p. 223.
  3. 31 scales round the body; six supraoculars; two pair of nuchals; 16—18 lamellae under the fourth toe. . . . . 62. *L. tornieri* p. 224.
  4. 26—29 scales round the body; seven supraoculars; a pair of nuchals; 16 lamellae under the fourth toe. . . . . 63. *L. schoedei* p. 225.
- II. Frontoparietal single; ear-opening punctiform 64. *L. chalcides* p. 225.
- B. Limbs didactyle; ear covered . . . . . 65. *L. sumatrense* p. 226.

### 51. *Lygosoma nigriventre* n. sp.

Head small, very flat; snout short, rounded; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral reaching between the nasals; frontonasal more broad than long, in contact with the rostral; praefrontals rather large, forming a suture; frontal broader than the supraocular region, shorter than frontoparietals and interparietal together, in contact with the first supraciliary and the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietals and interparietal subequal; parietals in contact; no nuchals; fifth upper labial below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and a half in that between axilla and groin; 30 smooth scales round the middle, dorsals largest; praeanales enlarged. Tail thick. Limbs short, separated when adpressed; digits short, compressed; fourth toe with 16—20 lamellae below.

Reddish-brown above, with numerous lighter, dark-edged spots; head with dark spots. Scales of the lower parts bordered

with dark brown or greyish, with a yellowish centre; tail dark

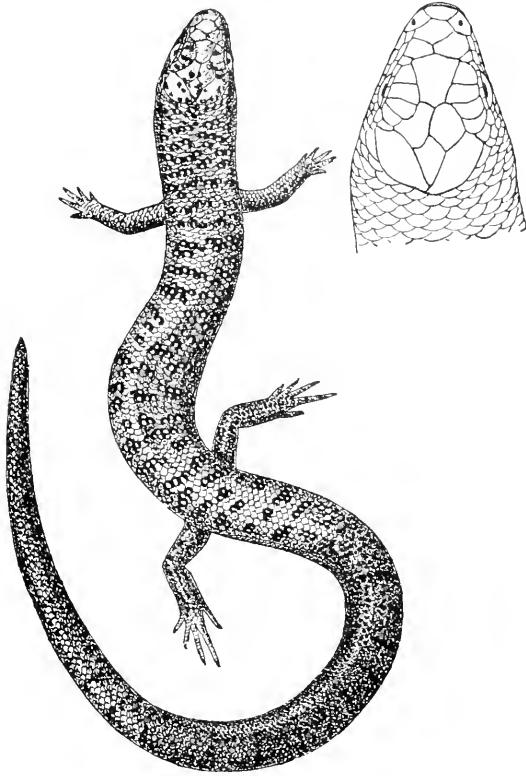


Fig. 83. *Lygosoma nigriventre* n. sp.

brown below, the scales dark with lighter borders. Length of head and body 90 mm.; tail (tip broken) 111 mm.

Habitat: S. New Guinea (Hellwig Mts. 1700 M.!).

#### 52. *Lygosoma loriae* Boulenger.

*Lygosoma loriae*, Boulenger, Ann. Mus. Civ. Genova (2) XVIII 1897, p. 698, pl. VII fig. 1.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral; praefrontals just meeting or narrowly separated; frontal broader than the supraocular region, as long as frontoparietals and interparietal together or a little shorter, in contact with the two anterior supraoculars; four supraoculars; eight

supraciliaries; frontoparietals and interparietal equal; parietals in contact; no nuchals, but three or four scales on each side in contact with the parietals; fifth upper labial below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and two thirds to one time and three fourths in the distance between axilla and groin; 30—32 smooth scales round the middle, the two vertebral series enlarged, laterals smallest; praeanales enlarged. Tail very thick. Limbs short, not meeting when adpressed; digits short, compressed, fourth toe with 16—17 smooth lamellae below.

Blackish-brown above, vermiculated with yellowish-brown. Lower parts yellowish; throat and sides spotted with dark brown. Length of head and body 66 mm.; tail 77 mm. (reproduced).

Type-specimen examined in the British Museum.

Habitat: New Guinea (Moroka in Bartholomew Range 2300 feet!).

### 53. *Lygosoma wollastoni* Boulenger.

*Lygosoma Wollastoni*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 261, pl. XXX fig. 1.

Head small, flat; snout obtusely pointed; lower eyelid scaly; ear-opening oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral narrow and produced between the nasals; frontonasal a little more broad than long, in contact with the rostral and with the frontal; praefrontals small, separated; frontal broader than the supraocular region, a little more long than broad, as large as frontoparietals and interparietal together, in contact with the first supraciliary, the first supraocular and a small part of the second; four supraoculars; seven or eight supraciliaries; frontoparietals and interparietal subequal; parietals in contact; a pair of slightly enlarged nuchals; fifth and sixth upper labials below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and two thirds in that between axilla and groin; 32 smooth scales round the middle, the two vertebral series enlarged; praeanales enlarged. Tail thick, one time and three fourths the length of head and body. Limbs short, widely separated when adpressed; digits short, compressed; 17 lamellae under the fourth toe.

Dark brown above; flanks mottled with light; a greyish oblique bar below the eye; last two upper labials whitish. Lower parts yellowish-white. Length of head and body 90 mm.; tail 155 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Mimika river!).

#### 54. *Lygosoma pratti* Boulenger.

*Lygosoma pratti*, Boulenger, Proc. Zool. Soc. London 1903, p. 128, pl. XIII fig. 1.

Head small, depressed, with a pointed snout; lower eyelid scaly; ear-opening oval, about as large as the eye-opening, without auricular lobules. Nostril in the nasal; no supranasal; rostral narrow, reaching between the nasals; frontonasal more broad than long, forming a narrow suture with the rostral and also with the frontal; latter much broader than the supraocular region, as large as frontoparietals and interparietal together, in contact with the first supraocular, part of the second and the first supraciliary; four supraoculars; seven supraciliaries; frontoparietals and interparietal distinct; parietals in contact behind the latter; no nuchals; fourth and fifth upper labials below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and three fourths in the distance between axilla and groin; 36 smooth scales round the middle, the two vertebral series enlarged; praeanales slightly enlarged. Tail very thick, one time and one fourth the length of head and body. Limbs short, widely separated when adpressed; digits short, compressed, with keeled lamellae below, mostly divided, 13 or 14 under the fourth toe.

Light brown above, vermiculated with dark brown; head lead-coloured, two oblique yellowish streaks from below the eye to the throat. Lower parts whitish; throat with some brown oblique lines. Length of head and body 87 mm.; tail 100 mm.

Habitat: New Guinea (Dinawa in Owen Stanley Range 4000 feet, Begowre river!).

#### 55. *Lygosoma neuhaussi* Vogt.

*Lygosoma neuhaussi*, Vogt, Sitz. ber. Ges. Naturf. Fr. Berlin N<sup>o</sup>. 9 1911, p. 422.

Head small, snout obtusely pointed; lower eyelid scaly; ear distinct, oval, no lobules. Rostral more broad than high; nostril

in the nasal; no supranasal; frontonasal squarish, forming a short suture with the rostral and the frontal; latter twice as broad as the supraocular region, as long as frontoparietals and interparietal together, in contact with the first supraocular and the first supraciliary; four supraoculars; five supraciliaries; frontoparietals and interparietal distinct, latter largest; parietals in contact behind the interparietal; one pair of nuchals and two temporals on each side; orbit separated from the upper labials by a series of small scales; fourth upper labial below the eye, five upper and four lower labials. Body long, 34—38 smooth scales round the middle; praeanals strongly enlarged. Tail thick, one time and one third the length of the body, with flat upper surface and sides and sharp edges at the base. Limbs short, widely separated when adpressed; digits short, 14 lamellae under the fourth toe.

Pale brown above, with 7—9 dark brown longitudinal lines, about  $\frac{3}{4}$ —1 mm. broad, covering the middle part of the scales; on the flanks these lines are broken up and fuse; head lead-coloured; two oblique yellowish streaks from the eye to the throat. Lower parts yellowish; throat with dark brown spots; lower part of tail dark brown. Length of head and body 89 mm.; tail 120 mm.

Habitat: New Guinea (Lorentz river!, Sattelberg).

### 56. *Lygosoma oligolepis* Boulenger.

*Lygosoma oligolepis*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 261, pl. XXX fig. 2.

Head small, flat; snout obtusely pointed; lower eyelid scaly; ear-opening oval, slightly smaller than the eye-opening, no lobules. Nostril in the nasal; frontonasal more broad than long, in contact with the rostral and with the frontal; praefrontals small, separated; frontal broader than the supraocular region, more long than broad, smaller than the frontoparietals and interparietal together, in contact with the first supraciliary and the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietals and interparietal subequal; parietals in contact; three to five pair of broad nuchals; fifth upper labial below the eye. Body long; the distance between the tip of the snout and the fore limb is contained twice in that between axilla and groin; 24 smooth scales round the middle,

the two vertebral series enlarged; praeanals enlarged. Tail thick, one time and a half the length of head and body. Limbs short, widely separated when adpressed; digits short, compressed; fourth toe with 12 or 13 lamellae below.

Dark brown above, dotted with yellowish-brown; frontal and part of the frontoparietals yellowish; lips dark brown. Lower parts yellowish, throat, sides and tail spotted with dark brown. Length of head and body 55 mm.; tail (reproduced) 60 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Mimika river!, Lorentz river!).

### 57. *Lygosoma solomonis* Boulenger.

*Lygosoma solomonis* 1), Boulenger, Cat. Liz. III 1887, p. 510, pl. XXIII fig. 4; Ann. Mus. Civ. Genova (2) XVIII 1897, p. 697.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; praefrontals small and separated; frontal broader than the supraocular region, about as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietals a little larger than the interparietal; parietals in contact; four to six pair of nuchals; fourth or fifth labial entering the orbit. Body long, the distance between the tip of the snout and the fore limb is contained one time and three fifths to one time and two thirds in that between axilla and groin; 24 or 26 smooth scales round the middle, the two vertebral series largest; praeanals enlarged. Tail thick, one time and one third the length of head and body. Limbs short, not meeting when adpressed; digits short, fourth toe with 15—17 smooth lamellae below.

Brown above, dotted with blackish. Lower parts pale brownish, dotted with brown. Length of head and body 57 mm.; tail 78 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Bara Bara on Milne Bay!). — Solomon Islands.

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1) Placed by Boulenger in the Section *Hinulia*.

58. *Lygosoma longicaudatum* n. sp.

Head small, flat; snout short, obtuse; lower eyelid scaly; ear-opening oval, half the diameter of the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral reaching

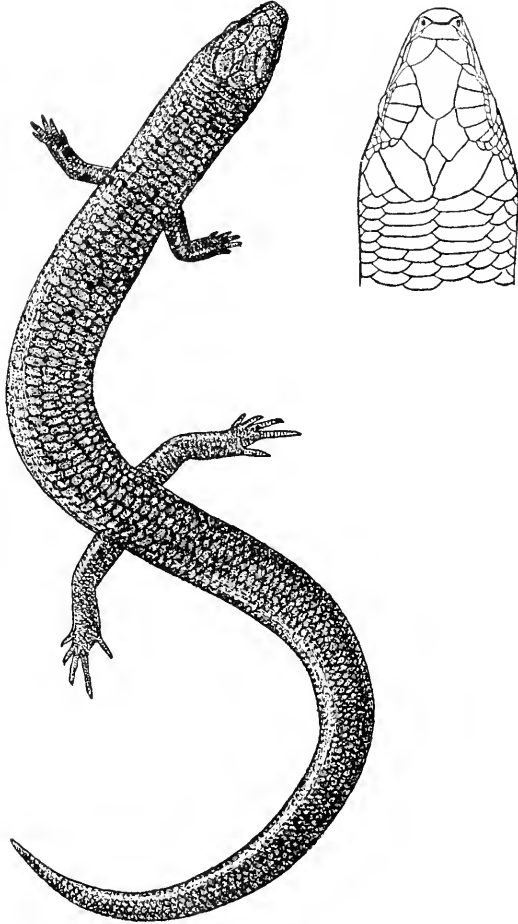


Fig. 84. *Lygosoma longicaudatum* n. sp. Tip of tail reproduced.

between the nasals; frontonasal twice as broad as long, in contact with the rostral; praefrontals rather large, forming a suture; frontal broader than the supraocular region, as long as frontoparietals and interparietal together, in contact with the first suprailiary and the two anterior supraoculars; four supraoculars; eight suprailiarys; frontoparietals as long as the



interparietal, which is narrow; parietals in contact; four or five pair of broad nuchals; fifth and sixth upper labials below the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and a half or one time and three fifths in that between axilla and groin; 28 smooth scales round the middle, the two vertebral series largest; praeanales enlarged. Tail thick, about one time and one fourth the length of head and body. Limbs short, widely separated when adpressed; digits short, compressed; fourth toe with 18—20 lamellae below.

Dark brown above; flanks lighter; sides with small yellowish, brown-edged spots; lips with greyish vertical bars continued on the chin. Lower parts yellowish; throat with greyish longitudinal lines; tail with small brownish spots. Length of head and body 92 mm.; tail 109 mm.

Habitat: S. New Guinea (Lorentz river!).

#### 59. *Lygosoma brevipes* Boettger.

*Lygosoma brevipes* 1), Boettger, Zool. Anz. XVIII 1895, p. 121; Abh. Senckenb. Ges. XXV 1900, p. 346, Taf. XIV fig. 3.

*Sphenomorphus brevipes*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 90.

Head small, flat; snout short, obtuse; lower eyelid scaly; ear-opening roundish, large, a little smaller than the eye-opening, no lobules. Nostril in a large nasal; no supranasals; rostral high, reaching between the nasals; frontonasal more broad than long, narrowly in contact with the rostral and with the frontal; praefrontals small and separated; frontal broader than the supraocular region, shorter than frontoparietals and interparietal together, in contact with the first supraciliary and the two anterior supraoculars; four supraoculars; six to eight supraciliaries, first largest; frontoparietals slightly larger than the interparietal; parietals in contact; four to six pair of nuchals; fifth upper labial large, below the eye, from which the labials are separated by a series of 6 scales, the second and fifth of these largest and wedged in between the labials. Body long, the distance between the tip of the snout and the fore limb is contained one time and a half to two times in that between

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1) Placed by Boettger in the Section *Homolepida*, and by Boulenger in the Section *Hinulia*.

axilla and groin; 28—30 smooth scales round the middle, the two vertebral series broadest, lateral scales smallest; praeanal strongly enlarged. Tail thick, about one time and a third to one time and a half the length of head and body. Limbs short, not meeting when adpressed; digits compressed, fourth toe much longer than third, with 14—16 smooth lamellae below.

Brown above, the scales black-edged; flanks dark-spotted; lips white- and black-banded. Lower parts yellowish, throat and tail speckled with brownish-grey. Young specimens with the snout and frontal region yellowish or whitish. Length of head and body 58 mm.; tail 91 mm. (reproduced).

Type-specimens examined from the Senckenberg Museum.  
Habitat: Halmahera!; Ternate!.

#### 60. *Lygosoma mülleri* (Schleg.).

*Scincus mülleri*, Schlegel, *Abbildungen*, 1837, p. 13, pl. III.

*Lygosoma muelleri*, Boulenger, *Cat. Liz.* III 1887, p. 338 (s. syn.).

*Homolepida Englishi*, de Vis, *Proc. Linn. Soc. N. S. Wales* (2) V 1890, p. 499.

Head small, depressed, with a long snout; lower eyelid scaly; ear-opening oval, slightly smaller than the eye-opening, without auricular lobules. Nostril in the nasal; no supranasal; rostral narrow, reaching between the nasals; frontonasal as long as broad or slightly more broad than long, forming a narrow suture with the rostral and one with the frontal; latter almost as long as frontoparietals and interparietal together, almost as broad as long, broader than the supraocular region, in contact with the two anterior supraoculars and the first supra-ciliary; five supraoculars; seven or eight supraciliaries; frontoparietals and interparietal distinct; parietals in contact behind the latter; one or two pair of nuchals; fifth and sixth upper labials below the eye. Body long, the distance between the tip of the snout and the fore limb is contained nearly twice in the distance between axilla and groin; 34 smooth scales round the middle, the two vertebral series enlarged; praeanal slightly enlarged. Tail thick, one time and a half to one time and three fourths the length of head and body. Limbs rather short, not meeting when adpressed; digits short, compressed, fourth toe with 18—20 smooth lamellae below, which are sometimes divided.

Brown above with small dark or light spots; a dark lateral band, edged with yellow, from the eye to the hind limb; a

dark bar below the eye; tail with a broad brown streak on each side. Lower parts yellowish, throat brownish. Length of head and body 170 mm.; tail 270 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Ternate?; Ceram!; New Guinea (Fak Fak, Lobo, Dorei, Andai!, Mansinam, Mafoor, Haas, Amberbaki, Jobi, near Lorentz river 1360 M., Mimika river, Katow, Astrolabe Bay!, Bukaua, Sogere 1750 feet, Five Bay, St. Joseph river, Haveri); Aru Islands!; Kei Islands.

Var. *latifasciatum* Meyer.

A form, somewhat differing in colour — reddish-brown with transverse dark bands, wider than the interspaces and forming complete rings on the tail — has been named *L. latifasciatum* by A. B. Meyer (Mon. Berl. Ak. 1874, p. 131). The head is dark brown with a yellowish spot between the eye and the ear. This variety was found in New Guinea: Dorei, Amberbaki, Erima on Astrolabe Bay. The specimen from Erima showed 32 scales, 17 lamellae under the fourth toe and reached a length of 180 mm. for head and body and 135 mm. for the tail. (Méhely, Termes. Füzetek XXI, 1898, p. 170).

61. *Lygosoma jeudei* Boulenger.

*Lygosoma tigrina* 1), v. Lidth de Jeude, Notes Leyden Mus. XVIII 1896/97 p. 250, pl. VI, fig. 1.

*Lygosoma jeudii*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 261.

Head small, flat; snout long; lower eyelid scaly; ear-opening oval, a little smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; rostral reaching between the nasals; frontonasal more broad than long, in contact with the rostral; praefrontals forming a short median suture; frontal broader than the supraocular region, more long than broad, as long as frontoparietals and interparietal together, in contact with the first supraciliary and the two anterior supraoculars; five supraoculars, last very narrow; seven supraciliaries; frontoparietals a little shorter than the interparietal; parietals in contact; no nuchals; fifth and sixth upper labials below the eye, from which they are separated by a row of seven sub-

1) Placed by v. Lidth de Jeude in the Section *Hinulia*.

oculars, the second and fourth of these large and wedged in between the fourth and fifth and fifth and sixth upper labials. Body long, the distance between the tip of the snout and the fore limb is contained one time and three fifths in that between axilla and groin; 34 smooth scales round the middle, the two vertebral series largest; praeanales slightly enlarged. Tail broad and flat at the base, angular, nearly one time and a half the length of head and body. Limbs short, not meeting when adpressed; digits short, compressed; fourth toe with 18 lamellae below, which are mostly divided.

Pale brown above, with reddish-brown transverse bands, broader than the interspaces; first band on the head behind the frontal, covering the supraocular region, the occiput and the nape, followed by eight bands on the back and fourteen or fifteen on the tail; cheeks whitish; a dark vertical stripe below the eye, passing on the lower labials and continued longitudinally to slightly beyond the ear-opening. Limbs reddish-brown. Lower parts whitish. Length of head and body 61 mm.; tail 87 mm.

Type-specimen (*L. tigrina* Lidth) examined in the Leyden Museum.

Habitat: New Guinea (Astrolabe Bay!, Bogadjim, Sattelberg).

## 62. *Lygosoma tornieri* Vogt.

*Lygosoma tornieri*, Vogt. Sitz. ber. Ges. Naturf. Fr. Berlin N<sup>o</sup>. 9 1911, p. 417.

Head very small, snout obtusely pointed; lower eyelid scaly; ear-opening round, smaller than the eye-opening, without auricular lobules. Rostral almost as high as broad; no supranasal; frontonasal small, in contact with the rostral and the frontal; latter nearly twice as broad as the supraocular region; six supraoculars; seven supraciliaries; frontoparietals and interparietal distinct, latter triangular; parietals narrow, in contact behind the interparietal; two pair of nuchals and a pair of temporals; six upper and five lower labials, the fifth upper labial bordering the orbit. Body long, 31 smooth scales round the middle, the two vertebral series enlarged; praeanales slightly enlarged. Tail one time and a half as long as head and body, compressed distally, almost quadrangular. Limbs slightly overlapping when adpressed; digits compressed, 16—18 lamellae under the fourth toe.

Black and white above, 19 black cross bands on the back and the tail; head black, praefrontals and a spot behind the eye white. Lower parts white; limbs greyish-black above, white below. Length of head and body 71 mm.; tail 85 mm. (After Vogt, not seen by me).

Habitat: New Guinea (Sepik river).

### 63. *Lygosoma schoedei* Vogt.

*Lygosoma schoedei*, Vogt, Sitz. ber. Ges. Naturf. Fr. Berlin N<sup>o</sup>. 1 1912, p. 6.

Snout moderate, not very obtuse; lower eyelid scaly; ear-opening almost as large as the eye, without auricular lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, forming a suture with the rostral and with the frontal; latter broader than the supraocular region, shorter than frontoparietals and interparietal together; seven supraoculars; six supraciliaries; frontoparietals larger than the interparietal; parietals narrow, in contact; a pair of nuchals and a pair of temporals; fifth upper labial below the eye, from which it is separated by a row of small scales. Body with 26—29 scales round the middle, the two vertebral series largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one third in that between axilla and groin; praecanals enlarged. Tail thick, round, one time and a half the length of head and body. Limbs short, separated when adpressed, by the length of a fore limb; digits compressed, short; fourth toe with 16 lamellae below.

Dark brown above, with light brown and dark spots; labials dark, with light streaks. Lower parts yellowish-brown; chin and throat with dark spots. Length of head and body 60 mm.; tail 88 mm. (After Vogt, not seen by me).

Habitat: Valise Island near the coast of German New Guinea.

### 64. *Lygosoma chalcides* (L.).

*Lacerta chalcides*, Linné, Syst. Nat. I 1766, p. 369.

*Lygosoma chalcides*, Boulenger, Cat. Liz. III 1887, p. 340 (s. syn.).

Snout short; lower eyelid scaly; ear-opening punctiform, about as large as the nostril. Nostril in the nasal; no supranasal; frontonasal more broad than long, in contact with the rostral and with the frontal; latter small, slightly broader than

the supraocular region, in contact with the first and second supraoculars; four supraoculars; seven supraciliaries; frontoparietal single, large; interparietal distinct; parietals in contact behind the latter; no nuchals; first upper labial largest, fifth

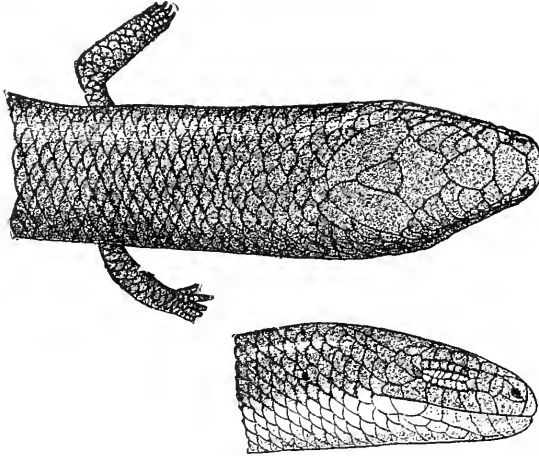


Fig. 85. *Lygosoma chalcides* (L.).

below the centre of the eye. Body very long and slender; the distance between the tip of the snout and the fore limb is contained four or five times in that between axilla and groin; 24 or 26 smooth, equal scales round the middle; pre-anals not or slightly enlarged. Tail thick, as long as head and body or a little shorter. Limbs very weak, the fore limb reaches about halfway from the ear, the hind limb is as long as the head from the tip to the end of the parietals; digits very short, equal.

Light brown above, with dark brown longitudinal lines between the scales. Lower parts lighter, uniform or also with brown lines. Length of head and body 96 mm.; tail 96 mm.

Nom. indig: Oelar berkaki or bengkarong (mal.).

Habitat: Sumatra!; Java (Batavia!, Buitenzorg!, Semarang!, Ngawi); Saleyer!. — Malacca; Siam; S. China; Philippines.

#### 65. *Lygosoma sumatrense* (Blkr.).

*Chelomeles sumatrensis*, Bleeker, Nat. Tijdschr. Ned. Ind. XX 1860, p. 328.

*Chelomeles sumatrensis*, Günther, Ann. Nat. Hist. (4) XII 1873, p. 146.

*Lygosoma sumatrense*, Boulenger, Cat. Liz. III 1887, p. 342, pl. XXVIII fig. 2.

Snout short; lower eyelid scaly; ear covered. Nostril in the

nasal; no supranasal; frontonasal more than twice as broad as long, in contact with the rostral and broadly with the frontal; praefrontals very small; frontal slightly more long than broad, broader than the supraocular region, in contact with the first and second supraoculars; three or four supraoculars; seven supraciliaries; frontoparietals distinct, as large as the interparietal; parietals in contact behind the latter; no nuchals; fourth upper labial bordering the orbit, first and fourth largest. Body very long; 22 smooth, equal scales round the middle; praeanal enlarged. Tail thick, longer than head and body. Limbs very small, didactyle; hind limb longer than fore limb; digits very short, equal on the fore limb, inner toe lower than outer.

Light brown above, with dark brown dots, sometimes forming longitudinal lines. Lower parts yellowish, dotted with brown on the tail. Length of head and body 93 mm.; tail 110 mm.

Habitat: Sumatra (Agam, Lolos, Kaju tanam!, Solok).

#### Section *Liolepisma* D. & B. (fig. 86).

Lower eyelid with a transparent disk; tympanum distinct; no supranasals. Rostral forming a suture with the frontonasal; frontal not broader than the supraocular region; enlarged nuchals present. Limbs strong, the hind limb longer than the distance between the centre of the eye and the fore limb.

#### Key to the Indo-Australian species.

##### A. Limbs pentadactyle.

I. Frontonasal as long as broad or more long than broad.

##### a. Digits somewhat dilated.

1. Five supraoculars; ear-opening small; 30, 32 or 34 scales round the body. . . . . 66. *L. virens* p. 229.
2. Four supraoculars; ear-opening large; 24 scales round the body; 19 lamellae under the fourth toe . . . . . 67. *L. longiceps* p. 230.

##### b. Digits not dilated; fourth toe longer than third.

1. 24 scales round the body; 21 lamellae under the fourth toe . . . . . 68. *L. miangense* p. 231.
2. 28 scales round the body; 25 lamellae under the fourth toe . . . . . 69. *L. vittigerum* p. 231.

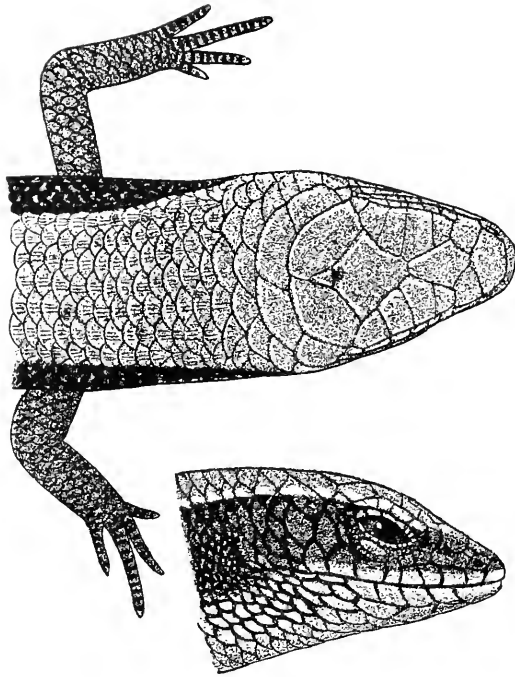


Fig. 86. Section *Liolepisma. Lygosoma fuscum* (D. B.).

3. 24—26 scales round the body; 19—22 lamellae under the fourth toe . . . . . 70. *L. noctua* p. 232.
- II. Frontonasal more broad than long.
- a. Two frontoparietals.
1. Scales smooth.
- aa. 30 scales round the body . . . . . 71. *L. elegans* p. 233.
- bb. 26 scales round the body . . . . . 72. *L. semoni* p. 234.
2. Scales finely striated; 30—32 scales round the body. . . . . 73. *L. textum* p. 234.
- b. Frontoparietal single.
- † Scales slightly keeled, 22 round the body; ear-opening large. . . . . 74. *L. inconspicuum* p. 235.
- †† Scales smooth; ear-opening small.
1. 22 scales round the body; ear-opening punctiform. . . . . 75. *L. nitens* p. 236.
2. 24 scales round the body; 20 lamellae under the fourth toe. . . . . 76. *L. miotis* p. 236.
3. 24 scales round the body; 22 lamellae under the fourth toe. . . . . 77. *L. pulchrum* p. 237.



4. 26 scales round the body; 19—20 lamellae under the fourth toe . . . . . 78. *L. subnitens* p. 238.  
 5. 32 scales round the body; 23—25 lamellae under the fourth toe . . . . . 79. *L. stanleyanum* p. 238.

*B.* Fingers four, toes five.

† Ear opening larger than the palpebral disk.

I. Interparietal present.

- a.* Frontal as long as frontoparietal and interparietal together . . . . . 80. *L. beccarii* p. 239.  
*b.* Frontal as long as frontoparietal or shorter.  
 1. 30—32 scales round the body; 26—32 lamellae under the fourth toe . . . . . 81. *L. bicarinatum* p. 240.  
 2. 32—38 scales round the body; 28—33 lamellae under the fourth toe . . . . . 82. *L. fuscum* p. 241.  
 3. 42 scales round the body; 32 lamellae under the fourth toe . . . . . 83. *L. pullum* p. 242.

II. No interparietal; 34—38 scales round the body; 30—32 lamellae under the fourth toe 84. *L. nigrigulare* p. 243.

†† Ear-opening smaller than the palpebral disk.

1. Ear-opening much smaller than the palpebral disk, with lobules all round its border . . . . . 85. *L. novae-guineae* p. 244.  
 2. Ear-opening a little smaller than the palpebral disk, with a single lobule anteriorly . . . . . 86. *L. curtum* p. 245.

## 66. *Lygosoma virens* (Ptrs).

*Lipinia virens*, Peters, Sitzb. Ges. Naturf. Fr. 1881, p. 81.

*Lygosoma virens*, Boulenger, Cat. Liz. III 1887, p. 254.

*Liolepisma virens*, Lucas, Proc. Linn. Soc. N. S. Wales XXIII 1898, p. 358.

Snout long, pointed; lower eyelid with a transparent disk; ear-opening vertical, with rounded lobules anteriorly. Nostril in the nasal; no supranasals; frontonasal broad, forming a broad suture with the rostral; praefrontals in contact; frontal long, rounded posteriorly, in contact with the three anterior supraoculars; five supraoculars, first longest; frontoparietals and interparietal distinct; parietals in contact behind the latter; two or three pair of nuchals; eight upper labials, separated from the eye by small scales, seventh small, below the centre of the eye. Body with 30, 32 or 34 scales round the middle, laterals smallest, dorsals, especially four median rows largest; praeanales enlarged. Limbs strong, the hind limb reaches the

axilla; digits dilated at the base, compressed distally, fourth toe with 13 lamellae under the basal and 7 smooth lamellae under the distal part.

Pale brown or greenish above, scales sometimes edged with brown; head with four greyish spots: on the frontal, on the supraocular regions and on the interparietal and part of the parietals; digits banded with dark. Lower parts whitish; subdigital lamellae dark brown. Length of head and body 65 mm.; tail 73 mm.

**Habitat:** New Guinea (Möso river!, Bara Bara, Fife Bay). — Trobriand Island; Ferguson Island; St. Aignan Island; Rossel Island.

### 67. *Lygosoma longiceps* Boulenger.

*Lygosoma longiceps*, Boulenger, Ann. Nat. Hist. (6) XVI 1895, p. 408.

Head two times and a half as long as broad; snout very long and pointed, depressed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more long than broad, forming a broad straight suture with the rostral; prae-frontals in contact; frontal small, as long as the frontoparietals and interparietal together, acutely pointed behind, in contact with the two anterior supraoculars; four supraoculars, first large; seven supraciliaries; frontoparietals almost as large as the interparietal; parietals in contact; three pair of nuchals; five upper labials before the subocular. Body with 24 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and fore limb almost equals that between axilla and groin; prae-anals enlarged. Tail about as long as head and body. Limbs strong, the hind limb reaches the wrist; digits depressed at the base, compressed distally, third and fourth equal, fourth toe with 19 smooth lamellae below.

Dark brown above, with three white, black-edged stripes, the middle one beginning at the tip of the snout, sometimes indistinct; the outer ones beginning at the eyes; tail golden. Lower parts and upper lip white, with greenish-golden gloss. Length of head and body 43 mm.; tail 55 mm.

Type-specimen examined in the British Museum.

**Habitat:** New Guinea (Sermowai river!, Bégowre river!,

Jaona!, Lake Sentani!, Etna Bay!, Lorentz river!, Stekwa river!). — Trobriand Island; Ferguson Island.

68. *Lygosoma miangense* Werner.

*Lygosoma (Liolepisma) miangense*, Werner, Mitt. Naturh. Mus. Hamburg XXVII 1910, p. 45.

Snout pointed; lower eyelid with a transparent disk; ear-opening small, roundish. No supranasals; praefrontals forming a suture; frontal in contact with the two anterior supraoculars; four supraoculars; frontoparietals and interparietal distinct; parietals in contact behind the latter; three pair of nuchals; four upper labials before the subocular. Body with 24 smooth scales round the middle, the two vertebral series enlarged; the distance between the tip of the snout and the fore limb slightly shorter than that between axilla and groin; praeanals enlarged. Tail nearly one time and a half the length of head and body. Limbs strong; digits angularly bent, fourth toe with 21 smooth lamellae below.

Golden above, with two dark brown stripes, beginning at the rostral, continuing on the supraoculars and parietals along the median enlarged scales to the hind limbs, where they become lighter and indistinct; a dark line from the eye to the fore limb; limbs light brown, indistinctly spotted with yellowish; digits banded with dark; tail yellowish. Lower parts greenish-white. Length of head and body 39 mm.; tail 56 mm. (After Werner, not seen by me).

Habitat: Pulu Miang, E. off Borneo.

69. *Lygosoma vittigerum* Boulenger.

*Lygosoma vittigerum*, Boulenger, Ann. Mus. Civ. Genova (2) XIV 1895, p. 615.

Snout very long, pointed; lower eyelid with a transparent disk; ear-opening small, roundish, no lobules. Nostril in the nasal; no supranasals; frontonasal as long as broad, in contact with the rostral and just touching the frontal, or praefrontals just meeting; frontal narrow behind, as long as frontoparietals and interparietal together, or a little shorter, in contact with the two anterior supraoculars; four supraoculars, first and last longest; seven supraciliaries; frontoparietals and interparietal distinct; parietals in contact behind the latter; three or four pair of nuchals; fifth upper labial large, below the eye. Body

slender; the distance between the tip of the snout and the fore limb is contained one time and one fifth in the distance between axilla and groin; 28 smooth scales round the middle, the two vertebral series largest, laterals small; praeanales enlarged. Tail nearly one time and a half the length of head and body. Limbs strong, the hind limb reaches the axilla; digits compressed distally, fourth toe with 25 smooth lamellae below.

Pale reddish-brown above, with a greenish-white vertebral stripe, beginning at the tip of the snout, bordered on each side by a broad black stripe; flanks pale olive, with or without black dots; limbs black-spotted. Lower parts greenish-white. Length of head and body 42 mm.; tail 56 mm.

Habitat: Mentawai Islands (Sipora); Borneo (Baram district!). — Malacca (500 and 2300 feet).

#### 70. *Lygosoma noctua* (Lesson).

*Scincus noctua*, Lesson, Voy. Coquille Zool. II 1830, p. 48 pl. III fig. 4.

*Lygosoma noctua*, Boulenger, Cat. Liz. III 1887, p. 256 (s. syn.).

*Leiolepisma noctua*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 93.

Snout pointed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal as long as broad, in contact with the rostral and with the frontal; latter as long as frontoparietal and interparietal together, or a little shorter, in contact with the two anterior supraoculars; four supraoculars, first and last longest; eight supraciliaries; frontoparietals as long as the interparietal; parietals in contact; two or three pair of nuchals; fifth upper labial below the eye. Body with 24—26 smooth scales round the middle, dorsals largest; the distance between the tip of the snout and the fore limb is contained one time and one fourth to one time and three fifths in the distance between axilla and groin; praeanales enlarged. Tail slightly longer than head and body. Limbs strong, overlapping when adpressed; digits compressed distally, fourth toe with 19—22 smooth lamellae below.

Golden brown above; on the occiput a white, dark-edged spot, continuous with a light vertebral stripe, edged on each side with dark brown spots; a brown lateral band, formed by large spots, dotted with light; lips with dark brown spots.

Lower surface greenish-white. Length of head and body 43 mm.; tail 55 mm.

*Habitat*: Sumatra? <sup>1)</sup>; Java? <sup>2)</sup>; Ternate; Halmahera; New Guinea (Pulu Faor, Jobi, Fak Fak!, Tangion Bair, Dorei, Mansinam, Sorong, Erima on Astrolabe Bay); Valise Island. — Bismarck Archipelago; Trobriand Island; Solomon Islands; New Hebrides; Fidji Islands; Samoa; Tonga Islands; Sandwich Islands; Tahiti.

### 71. *Lygosoma elegans* Boulenger.

*Lygosoma elegans*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 8, pl. I fig. 3.

Snout moderate; lower eyelid with a transparent disk; ear-opening roundish, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter as long as frontoparietal and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first and last longest; eight supraciliaries; frontoparietals and interparietal distinct; parietals in contact behind the latter; three pair of nuchals; fifth upper labial below the eye. Body with 30 smooth scales round the middle, the two vertebral series enlarged, twice as broad as long; the distance between the tip of the snout and the fore limb is contained one time and one fourth in the distance between axilla and groin; praeanales enlarged. Tail one time and two fifths the length of head and body. Limbs strong, the hind limb reaches the elbow; digits slender, compressed, fourth toe with 23 smooth lamellae below.

Light greenish-brown above, with blackish-brown spots, of which the largest are sometimes disposed in two series along the vertebral line, and continued on two thirds of the tail; digits banded with pale and dark brown, palm and sole bright yellow. Length of head and body 58 mm.; tail 80 mm.

Type-specimen examined in the British Museum.

*Habitat*: New Guinea (Humboldt Bay!, Moroka in Bartholomew Range 2300 feet!, Mt. Victoria in Owen Stanley Range!).

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1) Werner, Verh. Ges. Wien XLIV 1896, p. 13.

2) op. cit. p. 13, Werner states that a specimen of *L. noctua* from Java is preserved in the Vienna Museum.

72. *Lygosoma semoni* Oudemans.

*Lygosoma semoni*, Oudemans, in Semon's Zool. Forsch. Aust. Bd. V 1894, p. 142.  
*Liolepisma semonis*, Lucas, Proc. Linn. Soc. N. S. Wales XXIII 1898, p. 359.

Snout short; lower eyelid with a transparent disk; ear-opening very small, smaller than the palpebral disk, no lobules. Nostril in the nasal; no supranasals; frontonasal a little more broad than long, broadly in contact with the rostral and with the frontal, latter almost as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest; seven supraciliaries, first largest; frontoparietals nearly twice as large as the interparietal, behind which the parietals are in contact; two or three pair of nuchals; sixth and seventh upper labials below the eye. Body with 26 smooth scales round the middle, dorsals largest; the distance between the tip of the snout and the fore limb is contained nearly one time and a half in that between axilla and groin; praeanales enlarged. Tail one time and one third the length of head and body. Limbs strong, the hind limb reaches the wrist; digits slender, compressed, fourth toe with 21 lamellae below.

Light brown above with broad dark transverse bands, the first between the eye and the ear, seven or eight on the nape and back, the posterior alternating on both sides; tail with 14 dark bands; limbs and digits banded with dark brown; flanks with short longitudinal blackish lines. Lower parts white. Length of head and body 64 mm.; tail 79 mm.

Type-specimen examined in the Amsterdam Museum.

Habitat: New Guinea! (Stekwa river, Bara Bara, Kelesi, Albert Edward Range 6000 feet, Fife Bay). — Ferguson Island.

73. *Lygosoma textum* F. Müller.

*Lygosoma (Liolepisma) textum*, F. Müller, Verh. Ges. Basel X 1894, p. 838.  
*Lygosoma textum*, Boulenger, Proc. Zool. Soc. London 1897, p. 213, pl. XI fig. 3.

Snout short, pointed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal nearly twice as broad as long, forming a broad suture with the rostral; praefrontals in contact; frontal about as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; five supraoculars, first largest; eight or nine

supraciliaries; frontoparietals and interparietal equal; parietals in contact; no nuchals; fourth and fifth upper labials below the eye. Body with 30—32 smooth scales round the middle; the distance between the tip of the snout and the fore limb is contained one time and one third to one time and two thirds in the distance between axilla and groin; prae-anals enlarged. Limbs rather short, not meeting when adpressed; the hind limb half as long as the distance between axilla and groin; digits cylindrical, fourth toe with 13—15 smooth lamellae below.

Reddish-brown above with dark reticulation; flanks and sides of tail brown with yellowish spots; a black dorso-lateral band, dotted with light, beginning at the eye and passing above the ear; supraocular region darker; labials dark with light centre; limbs dark, white-spotted. Lower parts white; throat and tail speckled with dark. Length of head and body 42 mm.; tail (tip broken) 53 mm.

Habitat: Celebes (Sudara Volcano 4450 feet, Masarang Range!).

#### 74. *Lygosoma inconspicuum* F. Müller.

*Lygosoma (Leiolepisma) inconspicuum*, F. Müller, Verh. Ges. Basel X 1894, p. 837.  
*Lygosoma inconspicuum*, Boulenger, Proc. Zool. Soc. London 1897, p. 213,  
 pl. XI fig. 2.

Snout pointed; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; latter a little longer than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars, first and last longest; eight supraciliaries; frontoparietal single, longer than the interparietal; parietals in contact; three pair of nuchals; fifth upper labial below the centre of the eye. Body long; the distance between the tip of the snout and the fore limb is contained one time and three fifths in that between axilla and groin; 22 smooth scales round the middle, dorsals largest, median series enlarged; prae-anals enlarged. Limbs rather short, not meeting when adpressed; the hind limb half as long as the distance between axilla and groin; digits cylindrical; fourth toe with 18 smooth lamellae below.

Grey above; a dark brown lateral band, beginning at the tip of the snout; on the occiput and nape some dark brown

spots, one pair on the parietals and one on the nuchals. Lower parts white; chin grey. Length of head and body 50 mm.; tail (reproduced) 56 mm. (Not seen by me).

Habitat: Celebes (Bone Mts. 3900 feet).

#### 75. *Lygosoma nitens* Peters.

*Lygosoma (Mocca) nitens*, Peters, Mon. Berl. Ac. 1871, p. 573; Ann. Mus. Civ. Genova III 1872, p. 32, pl. IV fig. 2.

*Lygosoma nitens*, Boulenger, Cat. Liz. III 1887, p. 262.

Snout short; lower eyelid with a transparent disk; ear-opening minute. Nostril in the nasal; no supranasals; rostral large; frontonasal more broad than long, broadly in contact with the rostral and with the frontal; latter shorter than the frontoparietal, a little larger than the interparietal; four supraoculars; frontoparietal single; parietals in contact behind the interparietal; no enlarged nuchals; fourth upper labial below the eye, fifth largest. Body long, with 22 smooth scales round the middle, the two median series enlarged; praeanales enlarged. Tail one time and two thirds the length of head and body. Limbs strong, the hind limb reaches slightly beyond halfway between axilla and groin.

Green above, with a black lateral streak, beginning on the supraoculars; flanks spotted with black and light green; throat with brown longitudinal lines. Length of head and body 29 mm.; tail 47 mm. (Not seen by me).

Habitat: Borneo (Kuching, Sarawak).

#### 76. *Lygosoma miotis* Boulenger.

*Lygosoma miotis*, Boulenger, Ann. Nat. Hist. (6) XVI 1895, p. 29.

Snout pointed; lower eyelid with a transparent disk; ear-opening small, not larger than the palpebral disk, no lobules. Nostril in the nasal; no supranasals; frontonasal slightly more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter as long as frontoparietal and interparietal together, in contact with the two anterior supraoculars; four supraoculars; frontoparietal single, about as long as the interparietal; parietals in contact behind the latter; three pair of nuchals; fifth upper labial below the eye. Body with 24 (26) smooth scales round the middle, the two vertebral series largest; the distance between the tip of the snout and the



fore limb is contained one time and three fifths in the distance between axilla and groin; praeanals enlarged. Tail one time and two fifths as long as head and body. Limbs strong, overlapping when adpressed; digits compressed distally, fourth toe with 20 smooth lamellae below.

Golden brown above, with small blackish spots in two longitudinal series and a light dorso-lateral band, bordered beneath by confluent black spots; a whitish, black-edged spot on the occiput; lips brown-spotted. Lower parts whitish or greenish, sometimes each scale with a brown lateral border; chin with brown oblique bars; tail with longitudinal series of brown spots. Length of head and body 52 mm.; tail 72 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Tawarin river!, Sermowai river!, Bogadjim, Milne Bay!). — Ferguson Island.

#### 77. *Lygosoma pulchrum* Boulenger.

*Lygosoma pulchrum*, Boulenger, Proc. Zool. Soc. London 1903, p. 127, pl. XII fig. 3.

Snout pointed; lower eyelid with a transparent disk; ear-opening roundish, smaller than the eye-opening, no lobules. Nostril in a large nasal; no supranasals; frontonasal more broad than long, in contact with the rostral; praefrontals meeting or separated; frontal small, as long as the frontoparietal, pointed behind, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietal single, about twice as long as the interparietal; parietals in contact; three to five pair of nuchals; four upper labials before the subocular. Body slender; the distance between the tip of the snout and the fore limb is contained one time and one fourth in the distance between axilla and groin; 24 smooth scales round the middle, the two vertebral series largest, laterals smallest; praeanals strongly enlarged. Tail one time and a half as long as head and body. Limbs strong, the hind limb reaches the elbow; digits slender, fourth toe with 22 smooth lamellae below.

Black above, with five greenish-white longitudinal lines, beginning at the rostral, the middle one ending before the hind limbs; limbs reddish-brown, spotted with black; digits banded with dark; tail red with a regular series of vertical bands on

each side. Lower parts greenish-white. Length of head and body 38 mm.; tail 56 mm.

Habitat: New Guinea (Sermowai river!, Humboldt Bay!, Moso river!, Jaona!, Albert Edward Range 6000 feet).

#### 78. *Lygosoma subnitens* Boettger.

*Lygosoma subnitens*, Boettger, Abh. Mus. Dresden Bd. VI 1896/97, p. 2.

Snout short, pointed; lower eyelid with a transparent disk; ear-opening roundish, small, as large as the palpebral disk or a little smaller, no lobules. Nostril in the nasal; a large post-nasal; no supranasals; frontonasal much more broad than long, broadly in contact with the rostral and touching the frontal; latter a little shorter than frontoparietal and interparietal together, in contact with the two anterior supraoculars; four supraoculars, first longest, second broadest; six or seven supraciliaries; frontoparietal single; interparietal distinct, behind which the parietals are in contact; three large shields bordering the parietals, followed by two broad nuchals; fifth upper labial below the eye. Body long, the distance between the tip of the snout and the fore limb is contained about one time and three fifths in the distance between axilla and groin; 26 smooth scales round the middle, the two vertebral series enlarged; praeanales enlarged. Tail one time and one fourth the length of head and body. Limbs strong; digits compressed, fourth toe with 19—20 smooth lamellae below.

Bronze-brown above with two dark brown indistinctly black-dotted streaks; sides with a blackish-brown, light-spotted band, beginning above the ear and running posteriorly to beyond halfway the tail; labials indistinctly spotted with light and dark; behind the interparietal a median longitudinal light spot; limbs with light and dark dots; toes banded. Lower parts whitish with golden gloss. Length of head and body 45 mm.; tail 56 mm.

Habitat: New Guinea (Bongu on Astrolabe Bay, Moroka 2300 feet!).

#### 79. *Lygosoma stanleyanum* Boulenger.

*Lygosoma stanleyanum*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 7, pl. I, fig. 2.

Snout short, obtuse; lower eyelid with a transparent disk; ear-opening oval, smaller than the eye-opening, no lobules.

No supranasals; frontonasal much more broad than long, in contact with the rostral and sometimes with the frontal; praefrontals often forming a suture; frontal a little longer than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietal single; parietals in contact behind the interparietal; three to five pair of nuchals; fifth upper labial below the eye. Body moderate, the distance between the tip of the snout and the fore limb is contained one time and a half in the distance between axilla and groin; 32 smooth scales round the body, the two vertebral series largest, twice as broad as long; praeanales enlarged. Tail one time and a half the length of head and body. Limbs moderate, the hind limb reaches the elbow; digits slightly compressed, fourth toe with 23—25 smooth lamellae below.

Dark brown above, a broad dark lateral band, formed by black spots, edged with light on the head and the anterior part of the body; flanks greenish-white, black-dotted. Lower parts greenish-white. Length of head and body 60 mm.; tail 90 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Hellwig Mts. 2500 M., Mt. Victoria in Owen Stanley Range!).

### 80. *Lygosoma beccarii* (Ptrs. & Doria).

*Heteropus beccarii*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 361.  
*Lygosoma beccarii*, Boulenger, Cat. Liz. III 1887, p. 285.

Lower eyelid with a transparent disk; ear-opening larger than the palpebral disk, with long, pointed lobules all round its border, those on the anterior border very acute and half as long as the diameter of the ear. Nostril in the nasal; no supranasals; frontonasal more broad than long, in contact with the rostral and with the frontal; praefrontals separated; frontal as long as frontoparietal and interparietal together, in contact with the two anterior supraoculars; four large supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal small, but distinct; parietals in contact; a pair of temporals and a pair of nuchals; four labials before the subocular. Body with 38 scales round the middle, dorsals and laterals strongly tricarinate, nuchal scales with many keels; praeanales slightly enlarged. Tail one time and three fourths the length of head and

body. Limbs strong, the hind limb reaches the shoulder; fourth toe with 30 lamellae below.

Olive-brown above, spotted with black; scales black- or brown-edged; sides of neck and anterior part of the body black, dotted with olive or greenish; sutures of labials brown. Lower parts yellowish or greenish. Length of head and body 78 mm.; tail 130 mm.

Habitat: Kei Islands!

### 81. *Lygosoma bicarinatum* (Macleay).

*Heteropus bicarinatus*, Macleay, Proc. Linn. Soc. N. S. Wales II 1877, p. 68.

*Heteropus albertisii*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 362.

*Lygosoma albertisii*, Boulenger, Cat. Liz. III 1887, p. 286.

*Lygosoma bicarinatum*, Oudemans, in Semon's Zool. Forsch. Austr. Bd. V 1894, p. 143.

Snout obtuse; lower eyelid with a transparent disk; ear-opening oval, about as large as the palpebral disk, with long, pointed lobules all round its border, the anterior largest. Nostril in the nasal; no supranasals; frontonasal more broad than long, forming a suture with the rostral and with the frontal; latter as long as the frontoparietal or a little shorter, in contact with the two anterior supraoculars; four supraoculars; five or six supraciliaries; frontoparietal single; interparietal small, but distinct; parietals in contact; a pair of nuchals and a pair of temporals; four upper labials before the subocular. Body with 30—32 scales round the middle, dorsals and laterals sharply bicarinate; anterior nuchals with three or five keels; dorsals larger than laterals; the distance between the tip of the snout and the fore limb is contained one time and one fifth to one time and one third in that between axilla and groin; praeanal not or a little enlarged. Tail nearly twice the length of head and body. Limbs strong, the hind limb reaches the axilla; fingers four, toes five; fourth toe with 26—32 smooth lamellae below.

Olive-brown above, with or without three light, black-edged longitudinal lines on each side, and small black spots; these spots sometimes followed by small greenish ones; upper lip light, black-spotted. Lower parts greenish or yellowish-white. Length of head and body 45 mm.; tail 88 mm.

Habitat: New Guinea! (Yule Island!, Mt. Epa, Fly river, St. Joseph river, Rigo, Aroma, Hula). — Islands of Torres Straits.

82. *Lygosoma fuscum* (Dum. & Bibr.).

*Heteropus fuscus*, Dum. & Bibr., *Exp. Gén.* V 1839, p. 759.

*Lygosoma fuscum*, Boulenger, *Cat. Liz.* III 1887, p. 283 (s. syn.).

*Lygosoma atrogulare*, Douglas Ogilby, *Rec. Austr. Mus.* I 1890, p. 94.

*Lirolepisma fuscum*, Lucas, *Proc. Linn. Soc. N. S. Wales* XXIII 1898, p. 358.

*Lirolepisma fuscum*, Barbour, *Mem. Mus. Comp. Zool. Harv. Coll.* XLIV 1912, p. 92.

Snout obtuse; lower eyelid with a transparent disk; ear-opening oval, as large as the palpebral disk or a little larger, with one or two lobules or a great many, all round its border,

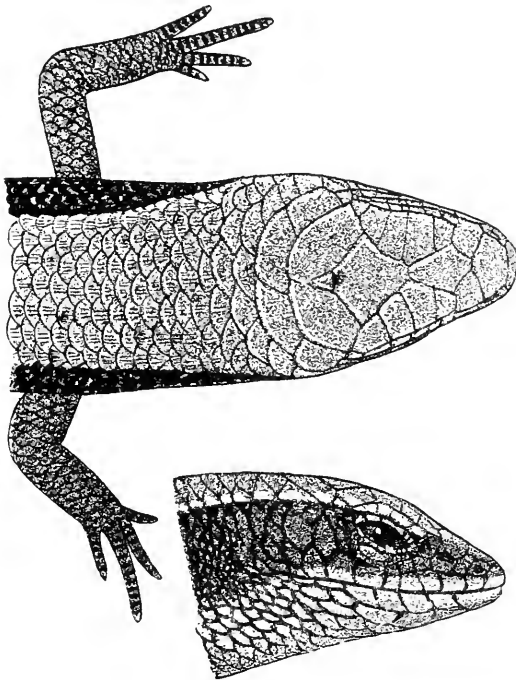


Fig. 87. *Lygosoma fuscum* (D. B.).

obtuse or pointed. Nostril in the nasal; no supranasals; fronto-nasal more broad than long, forming a suture with the rostral and often with the frontal; latter as long as the frontoparietal or a little shorter, in contact with the two anterior supraoculars; four supraoculars; seven to nine supraciliaries; frontoparietal single; interparietal small, but distinct; parietals in contact; a pair of nuchals and a pair of temporals; four or five upper labials before the subocular. Body with 32—38 scales round the middle, dorsals and laterals sometimes smooth,

sometimes with three or five keels, laterals smaller than dorsals; the distance between the tip of the snout and the fore limb is contained one time and one third in that between axilla and groin; praeanals a little enlarged. Tail one time and a half the length of head and body or a little longer. Limbs strong, the hind limb reaches the axilla or beyond; fingers four, toes five; fourth toe with 26—33 smooth lamellae below.

Brown or olive above, uniform or spotted with black and green, sometimes a black, light-edged lateral band with green spots and a black vertebral line. Lower parts greenish-white. Length of head and body 67 mm.; tail 117 mm.

Habitat: Pulu Sukur near Flores!; Damma!; Halmahera; Ternate; Pulu Kelang!; Ceram!; Ambon!; Saparua; Goram; Kei Islands; Aru Islands; Misol; Salawatti; Waigeu!; Rawak Island; New Guinea (Jobi, Ron!, Urville, Haas, Amberbaki, Dorei, Mansinam, Arfak, Passim, Sorong, Fak Fak, Epa, Djamna, Manokwari!, Jäga!, Mawes!, Lake Sentani!, Sermowai river!, Humboldt Bay!, Lorentz river!, Mimika river!, Stekwa river, Merauke!, Fly river, Katow, St. Joseph river, Fife Bay, Rigo, Kelesi, Aroma, Bara Bara, Haveri, Inawi, Bogadjim, Astrolabe Bay!, Friedrich-Wilhelmshafen); Valise Island. — Ferguson Island; Trobriand Island; Rossel Island; Queensland; Islands in Torres Straits; Bismarck Archipelago; Admiralty Islands.

The eggs measure 12 by 65 mm.

#### Var. *tricarinatum* Meyer.

*Heteropus tricarinatus*, Meyer, Mon. Berl. Ac. 1874, p. 133.

*Heteropus tricarinatus*, Doria, Ann. Mus. Genova VI 1874, p. 340.

*Heteropus tricarinatus*, Sauvage, Bull. Soc. Philom. (7) II 1877, p. 35; (7) III 1878/79, p. 48.

*Lygosoma fuscum* var. *tricarinatum*, Boulenger, Trans. Zool. Soc. London XX 1914, p. 258.

The dorsal scales have three strong keels. Throat and sides of neck blue with black longitudinal lines in males.

Habitat: New Guinea (Dorei, Amberbaki, Haas, d'Urville Island, Mimika river, Stekwa river, Lorentz river!).

#### 83. *Lygosoma pullum* (Barbour).

*Leiolopisma pullum*, Barbour, Proc. Biol. Soc. Washington XXIV 1911, p. 15; Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 93, pl. 2, fig. 3.

Snout obtuse; lower eyelid with a transparent disk; ear-

opening oval, larger than the palpebral disk, with small lobules all round its border. Nostril in the nasal; no supranasals; frontonasal much more broad than long, forming a broad suture with the rostral and a narrow one with the frontal; latter a little shorter than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietal single; interparietal small, but distinct; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; four labials before the subocular. Body with 42 scales round the middle, dorsals and laterals distinctly tricarinate; the distance between the tip of the snout and the fore limb is contained one time and one fourth in the distance between axilla and groin; praeanales feebly enlarged. Tail nearly twice as long as head and body. Limbs strong, the hind limb reaches beyond the anterior side of the fore limb; fingers four, toes five; fourth toe with 32 lamellae below.

Dark brown above, with two crossing, irregular lines of light spots, some of which have black centres; flanks with a dark band, broken up into squarish blotches by white vertical lines. Tail with two light longitudinal stripes, edged above with brown, below with yellow. Lower parts yellowish. Length of head and body 51 mm.; tail 90 mm. (After Barbour, not seen by me).

Habitat: New Guinea (Humboldt Bay).

#### 84. *Lygosoma nigrigulare* Boulenger.

*Lygosoma nigrigulare*, Boulenger, Ann. Mus. Civ. Genova (2) XVIII 1897, p. 700, pl. VII, fig. 3.

Snout obtuse; lower eyelid with a transparent disk; ear-opening oval, larger than the palpebral disk, with small, pointed lobules round its border. Nostril in the nasal; no supranasals; frontonasal more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter as long as the frontoparietal, in contact with the two anterior supraoculars; four supraoculars, second largest; eight supraciliaries; frontoparietal single, fused with the interparietal; parietals in contact; a pair of nuchals and a pair of temporals; four upper labials before the subocular. Body with 34—38 scales round the middle, dorsals largest, smooth or with three low keels; the distance between the tip of the snout and the fore limb is contained one time and one sixth to one time and one third in the

distance between axilla and groin; prae-anals feebly enlarged. Tail one time and a half to one and two thirds as long as head and body. Limbs strong; the hind limb reaches the axilla or the shoulder; fingers four, toes five; fourth toe with 30—32 smooth lamellae below.

Blackish-brown or olive above, iridescent, uniform or with indistinct, small, paler spots; some of the scales edged with black; an indistinct light line from the posterior corner of the eye passing above the ear and bordered below by a dark band; flanks blackish or olive with pale spots. Lower parts of body and limbs dirty white, or greenish, sometimes with blackish spots on the breast; chin, throat and lips black, sometimes bluish. Length of head and body 76 mm.; tail 120 mm.

Type-specimen examined in the British Museum.

Habitat: New Guinea (Lake Sentani!, Inawi in Mekeo district!).

#### 85. *Lygosoma novae-guineae* Meyer.

*Lygosoma (Carlia) novae-guineae*, Meyer, Mon. Berl. Ac. 1874, p. 132.

*Lygosoma novae-guineae*, Boulenger, Cat. Liz. III 1887, p. 289 (s. syn.).

*Iolepisma novae-guineae*, Lucas, Proc. Linn. Soc. N. S. Wales XXIII 1898, p. 359.

*Leiolepisma novae-guineae*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 93.

Snout short; lower eyelid with a large transparent disk; ear-opening roundish, much smaller than the palpebral disk, with triangular lobules all round its border. Nostril in the nasal; no supranasals; frontonasal more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter shorter than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal distinct; parietals in contact; a pair of nuchals and a pair of temporals; three or four upper labials before the subocular. Body with 24—28 smooth scales round the middle; the distance between the tip of the snout and the fore limb is contained one time and one fourth to one time and a half in the distance between axilla and groin; prae-anals not enlarged. Tail one time and a half the length of head and body. Limbs strong, the hind limb reaches the wrist; fingers four, toes five; fourth toe with 21—25 smooth lamellae below.



Brown above, flanks with a dark, yellow-edged band, sometimes indistinct in the adult; lips whitish, black-spotted. Lower parts whitish, sometimes brown-dotted. Length of head and body 33 mm.; tail 48 mm.

Habitat: Halmahera; Ternate; Batjan; Obi; Ceram; Ambon; Kei Islands; New Guinea (Pulu Faor, Rubi, Lorentz river!, Stekwa river, Bara Bara, Haveri, Fife Bay, Katow). — Islands of Torres Straits.

### 86. *Lygosoma curtum* Boulenger.

*Lygosoma curtum*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 9.

Snout very short, obtuse; lower eyelid with a transparent disk; ear-opening roundish, a little smaller than the palpebral disk, with a single lobule anteriorly. No supranasals; fronto-nasal nearly twice as broad as long, broadly in contact with the rostral, narrowly with the frontal; latter as long as or a little shorter than the frontoparietal, in contact with the two anterior supraoculars; eight supraciliaries; frontoparietal single; interparietal distinct; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; three upper labials before the subocular. Body short and stout; the distance between the tip of the snout and the fore limb is contained one time and two fifths to one time and a half in the distance between axilla and groin; 26 scales round the middle, all smooth or dorsals with three feeble grooves; praeanales not enlarged. Tail a little longer than head and body. Limbs feeble, the hind limb reaches the wrist; digits short, fingers four, toes five; fourth toe with 23—25 smooth lamellae below.

Dark brown above, uniform or with small lighter spots; lips brown-spotted. Lower parts yellowish or greenish-white. Length of head and body 37 mm.; tail 45 mm.

Type-specimens examined in the British Museum.

Habitat: New Guinea (Mt. Victoria in Owen Stanley Range!).

### Section **Emoa** Gray (fig. 88).

Lower eyelid with a transparent disk; tympanum distinct; supranasals present. Rostral forming a suture with the fronto-nasal; frontal not broader than the supraocular region. Prae-

anals not or slightly enlarged. Limbs strong, pentadactyle, overlapping when adpressed.

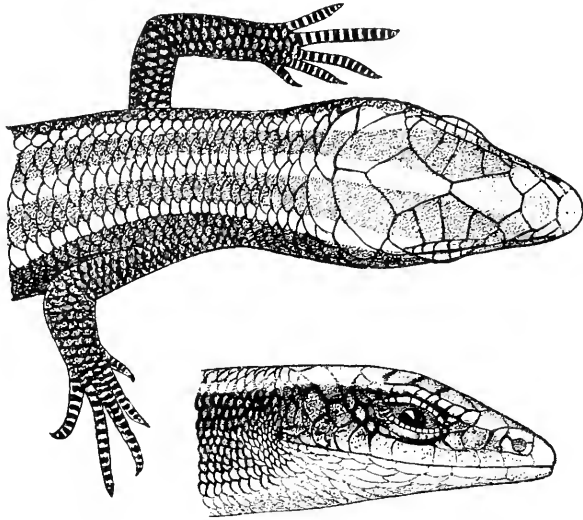


Fig. 88. Section *Ema. Lygosoma cyanurum* (Less.).

### Key to the Indo-Australian species.

A. Frontal much longer than the prae-frontal.

I. 40 or more lamellae under the fourth toe.

a. Interparietal distinct.

1. 24—26 scales round the body; 70—90

lamellae under the fourth toe. . . . . 87. *L. cyanogaster* p. 248.

2. 28—32 scales round the body; 38—47

lamellae under the fourth toe. . . . . 88. *L. sortex* p. 249.

3. 33—36 scales round the body; 75—87

lamellae under the fourth toe. . . . . 89. *L. cuneiceps* p. 249.

b. Interparietal fused.

1. Ear-opening slightly larger than the palpebral disk, with one to three small lobules anteriorly.

aa. 26—28 smooth scales round the body;

50 lamellae under the fourth toe . . . 90. *L. tetrataenia* p. 250.

bb. 30 or 32 scales round the body, dorsals

with 5 or 7 feeble keels; 40—42 lamellae under the fourth toe. . . . . 91. *L. klossi* p. 251.

cc. 40—46 (34) scales round the body, dorsals with 3—5 indistinct keels:

44—58 lamellae under the fourth toe. 92. *L. kuekenthali* p. 251.

2. Ear-opening as large as the palpebral disk.

† Auricular lobules present.

a. 24—29 scales round the body; 60—70 lamellae under the fourth toe. . . . . 93. *L. iridescens* p. 252.

b. 26—36 scales round the body; 40—60 lamellae under the fourth toe. . . . . 94. *L. cyanurum* p. 253.

c. 32—44 scales round the body; 40—45 lamellae under the fourth toe; frontoparietal as long as broad. . . . . 95. *L. mixarti* p. 255.

†† No auricular lobules; frontoparietal more long than broad. . . . . 96. *L. méhelyi* p. 256.

II. 40 or fewer lamellae under the fourth toe.

1. Interparietal fused.

a. 28 scales round the body, dorsals with 2 keels; 38 lamellae under the fourth toe; no auricular lobules. . . . . 97. *L. callisticium* p. 256.

b. 36—40 scales round the body, smooth, sometimes with 2 or 3 keels; 30—38 lamellae under the fourth toe; auricular lobules absent or small; the hind limb does not quite reach the elbow. . . . . 98. *L. baudini* p. 257.

c. 34—36 scales round the body, dorsals with 2—5 sharp keels; 34—40 lamellae under the fourth toe; auricular lobules present; the hind limb reaches the axilla or the shoulder. . . . . 99. *L. tropidolepis* p. 258.

d. 30—34 smooth scales round the body; 33—40 lamellae under the fourth toe; auricular lobules present. . . . . 100. *L. pallidiceps* p. 259.

2. Interparietal distinct.

a. 30—40 smooth scales round the body; 35—38 lamellae under the fourth toe; auricular lobules present; ear-opening a little larger than the palpebral disk. . . . . 101. *L. atrocostatum* p. 259.

b. 36—40 scales round the body, smooth or dorsals with 5 keels; 32—40 lamellae under the fourth toe; no auricular lobules; ear-opening much larger than the palpebral disk. . . . . 102. *L. nigrum* p. 260.

B. Frontal not or slightly longer than the prefrontal.

36 scales round the body . . . . . 103. *L. parietale* p. 261.

87. *Lygosoma cyanogaster* (Lesson).

*Scincus cyanogaster*, Lesson, Voy. Coquille Zool. II 1830, p. 47, pl. III fig. 3.

*Lygosoma cyanogaster*, Boulenger, Cat. Liz. III 1887, p. 292 (s. syn.).

*Emoia cyanogaster*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 94.

Snout long, obtuse; lower eyelid with a transparent disk; ear-opening roundish or oval, not or slightly larger than the palpebral disk, with two or three short lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal as long as broad or more broad than long, in contact with the rostral and sometimes with the frontal; praefrontals very shortly in contact, if at all; frontal as long as the frontoparietal or as the latter and the interparietal together, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal small but distinct; parietals in contact behind it; a pair of nuchals and a pair of temporals; five labials before the large subocular. Body with 24—26 smooth scales round the middle, the two vertebral series largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one third to one time and a half in the distance between axilla and groin; praeanales not or feebly enlarged. Tail twice as long as head and body or longer still. Limbs strong, the hind limb reaches the elbow or the axilla; digits moderate, depressed, the distal part compressed; fourth toe with 70—90 smooth lamellae below.

Olive or brown above, uniform or with small blackish and pale spots; sometimes a black lateral band beginning at the nostril, passing through the eye and lost on the flanks; this band bordered by a series of light spots. Lower parts yellowish or bluish green. Length of head and body 99 mm.; tail 190 mm.

Habitat: Ambon; Halmahera; Waigeu!; New Guinea (Jobi, Mafoor, Haas, Rubi, Mansinam, Sorong, Sermowai river!, Tanah Merah Bay!, Humboldt Bay!, Mimika river, Stekwa river, Lorentz river!, Tangion Bair, Katow, Fly river, Bara Bara, Haveri, Fife Bay); Schouten Islands (Mysore); Aru Islands; Kei Islands. — Ferguson Island; Trobriand Island; Woodlark Island; Rossel Island; Queensland; Islands of Torres Straits; Bismarck Archipelago; Solomon Islands; Santa Cruz; New Hebrides.

88. *Lygosoma sorex* Boettger.

*Lygosoma sorex*, Boettger, Zool. Anz. XVIII 1895, p. 118; Abh. Senckenb. Ges. XXV 1900, p. 343, pl. XIV fig. 2.  
*Emoia sorex*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 95.

Snout long, depressed, pointed; lower eyelid with a transparent disk; ear-opening roundish or oval, a little smaller than the palpebral disk, with 1—3 very small lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal slightly more broad than long, broadly in contact with the rostral and just touching the frontal; latter as long as the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal distinct, small; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; five (sometimes 4) upper labials before the large subocular. Body with 28—32 scales round the middle, dorsals largest, with an indication of three keels, laterals smallest; praeanales a little enlarged. Tail twice as long as head and body. Limbs strong, the hind limb reaches the shoulder or beyond; digits moderate, depressed at the base, compressed in the distal part; the fourth toe with 38—47 lamellae below.

Olive-brown with metallic gloss, dorsal scales often edged with dark; back, limbs and tail with lighter, dark-edged spots; a grey streak along the edge of the upper labials; fingers and toes annulate with dark and light. Lower parts whitish with golden gloss. Length of head and body 52 mm.; tail 112 mm.

Type-specimen examined in the British Museum.

Habitat: Halmahera!; Batjan; Obi Island.

89. *Lygosoma cuneiceps* (de Vis).

*Emoia cuneiceps*, de Vis, Proc. Linn. Soc. N. S. Wales (2) V 1890, p. 498.

Snout long, pyramidal, depressed; lower eyelid with a transparent disk; ear-opening roundish or oval, as large as or a little larger than the palpebral disk, with one to three small lobules anteriorly. Supranasals present; frontonasal as long as broad, forming a suture with the rostral and a smaller one with the frontal; latter a little longer than the frontoparietal; four supraoculars; seven supraciliaries; interparietal distinct; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; five upper labials anterior to the large

subocular. Body slender; 33—36 smooth scales round the middle, dorsals slightly larger than ventrals, sometimes with three or more obscure pigment lines; praeanals not or somewhat enlarged. Tail two times and a half as long as head and body. Limbs strong; the hind limb reaches the elbow or beyond; digits moderate, basal part depressed, distal compressed, fourth toe with 75—87 lamellae below.

Olive-brown above, strongly iridescent, speckled on back and sides with paler scales; head uniformly brown. Lower parts greenish-yellow; mental and rostral pale buff. Length of head and body 82 mm.; tail 201 mm. (After de Vis, not seen by me).

Habitat: New Guinea (St. Joseph river).

90. *Lygosoma tetrataenia* Boulenger.

*Lygosoma tetrataenia*, Boulenger, Ann. Nat. Hist. (6) XVI 1895, p. 30.

Snout long, pointed; lower eyelid with a transparent disk; ear-opening oval, a little larger than the palpebral disk, with three very short lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal as long as broad, in contact with the rostral and the frontal; latter shorter than the frontoparietal, which is single and fused with the interparietal, in contact with the two anterior supraoculars; four supraoculars, second and fourth longest; seven supraciliaries; parietals in contact behind the frontoparietal; a pair of nuchals and a pair of temporals; five upper labials before the large subocular. Body with 26—28 smooth scales round the middle, dorsals, especially the two vertebral rows largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one third to one time and two fifths in the distance between axilla and groin; praeanals a little enlarged. Tail nearly twice as long as head and body. Limbs strong, the hind limb reaches the elbow or the axilla; digits moderate, depressed, the distal part subcylindrical; fourth toe with 50 smooth lamellae below.

Olive above, with four broad black stripes, the outer pair beginning at the end of the snout, passing through the eye. Lower parts bluish-white; throat and limbs below bluish or greenish. Length of head and body 59 mm.; tail 110 mm.

Type-specimens examined in the British Museum.

Habitat: Ferguson Island! d'Entrecasteaux Archipelago; Rossel Island!, Louisiade Archipelago.

91. *Lygosoma klossi* Boulenger.

*Lygosoma klossi*. Boulenger, Transact. Zool. Soc. London XX 1914, p. 259, pl. 29 fig. 3.

Snout long, obtusely pointed; lower eyelid with a transparent disk; ear-opening oval, larger than the palpebral disk, with one or two small lobules anteriorly. Nostril between three shields, a nasal, a postnasal and a supranasal; frontonasal much more broad than long, broadly in contact with the rostral and narrowly with the frontal; latter slightly longer than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars, seven supraciliaries; frontoparietal single and fused with the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; six or seven labials before the large subocular. Body with 30 or 32 scales round the middle, dorsals with five or seven feeble keels; dorsal scales largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one fourth to one time and one third in that between axilla and groin; praeanales very slightly enlarged. Tail more than twice as long as head and body. Limbs strong, the hind limb reaches the axilla; digits long, compressed, fourth toe with 40—42 smooth lamellae below.

Brown above, iridescent, with black spots, sometimes with whitish spots, as large as a whole scale; a black band from the eye to the shoulder. Lower parts greenish, with a few black dots. Length of head and body 90 mm.; tail 200 mm.

Type-specimens examined in the British Museum.

Habitat: New Guinea (Utakwa river 2500 feet!).

92. *Lygosoma kuekenthali* Boettger.

*Lygosoma kuekenthali*, Boettger, Zool. Anz. XVIII 1895, p. 117; Abh. Senckenb. Ges. XXV 1900, p. 342, pl. XIV fig. 1.

Snout long, obtusely pointed; lower eyelid with a transparent disk; ear-opening oval, larger than the palpebral disk, with three short lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter shorter and narrower than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries, third largest;

frontoparietals and interparietal fused; parietals forming a long suture behind the latter shield; a pair of nuchals and a pair of temporals; five upper labials anterior to the large subocular. Body with 40—46 (34) scales round the middle, dorsals largest, with 3—5 indistinct keels, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time to one time and one third in the distance between axilla and groin; praeanals slightly enlarged. Tail nearly twice and a half as long as head and body. Limbs strong, the hind limb reaches between the axilla and the ear-opening; digits strong, distal part compressed; fourth toe with 44—58 smooth lamellae below.

Olive-brown above, with lighter and darker scales, arranged in irregular transverse lines; a black lateral band, beginning at the eye and broken up into spots at its posterior part, edged above with a longitudinal series of white spots; flanks, sides of tail and limbs with light spots. Length of head and body 72 mm.; tail 171 mm.

Type-specimen examined in the British Museum.

Habitat: Halmahera!; Batjan; Ambon!.

### 93. *Lygosoma iridescens* Boulenger.

*Lygosoma iridescens*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 9, pl. I fig. 4.

Snout pointed; lower eyelid with a transparent disk; ear-opening oval, as large as the palpebral disk, with two or three small lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal more broad than long, forming a narrow suture with the rostral and with the frontal; latter shorter than the frontoparietal, in contact with two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietal single, fused with the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; five labials anterior to the large subocular. Body with 24—29 smooth scales round the middle, dorsals largest; the distance between the end of the snout and the fore limb is contained one time and one fourth in the distance between axilla and groin; praeanals not enlarged. Tail more than twice the length of head and body. Limbs strong, the hind limb reaches the axilla; digits moderate, depressed, the distal part almost round; fourth toe with 60—70 smooth lamellae below.



Greenish-bronzy above, strongly iridescent, with small black spots; sides dark brown with black and yellow dots; a light dorso-lateral streak, beginning at the eye; dorsal scales with

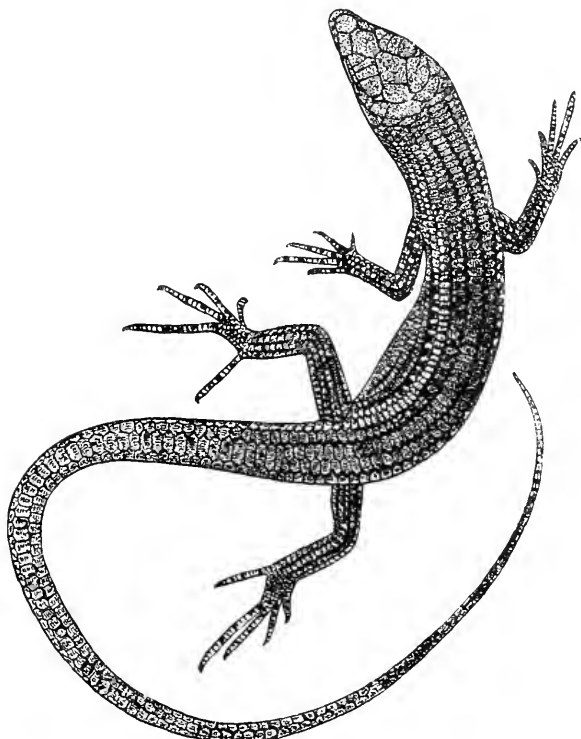


Fig. 89. *Lygosoma iridescens* Blgr.

dark brown striae. Lower parts pale green, palm and sole bright yellow. Length of head and body 50 mm.; tail 111 mm.

**Habitat:** Waigeu!; New Guinea (Fak Fak, Sermowai river!, Kaiserin-Augusta river!, Lorentz river!, Mimika river, Stekwa river, Mt. Victoria in Owen Stanley Range, Bara Bara on Milne Bay); Aru Islands.

#### 94. *Lygosoma cyanurum* (Lesson).

*Scincus cyanurus*, Lesson, Voy. Coquille Zool. II 1830, p. 49, pl. IV fig. 2.

*Lygosoma cyanurum*, Boulenger, Cat. Liz. III 1887, p. 290 (s. syn.).

*Emoia cyanurum*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 93.

Snout pointed; lower eyelid with a transparent disk; ear-opening oval, about as large as the palpebral disk, with two

or three very short lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; fronto-nasal more broad than long, forming a broad suture with the rostral and usually also with the frontal; latter slightly shorter than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single, fused with the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; four or five labials before the large subocular. Body with 26—36 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the end of the snout and the fore limb is contained one time to one time and one third in the

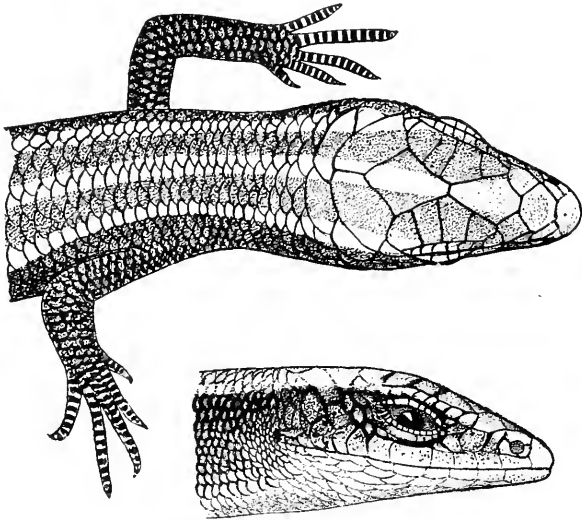


Fig. 90. *Lygosoma cyanurum* (Less.).

distance between axilla and groin; praeanales not or feebly enlarged. Tail about one time and two thirds to twice the length of head and body. Limbs strong, the hind limb reaches the elbow or the shoulder; digits moderate, depressed, the distal part roundish; fourth toe with 40—60 smooth lamellae below.

Brown, olive or blackish above, with three or five golden or greenish longitudinal bands, the vertebral one beginning at the rostral; tail azure-blue. Lower parts whitish. Length of head and body 53 mm.; tail 95 mm.

Nom. indig.: tologana (Toradja-name).

Habitat: Java!; Samoa!; Timor!; Gr. Bastard!; Borneo!;

Celebes (Gorontalo, Manado!, Posso!, Kema, Paloppo, Kandari, Luhu!); Togian Islands; Sanghir Islands; Karakelang Islands!; Salibabu Islands!; Ternate; Halmahera; Morotai!; Nusa Laut!, Buru; Ambon!, Ceram!; Goram; Kei Islands!; Aru Islands; Timor Laut; Misol; Salawatti; Waigeu!; New Guinea (Jobi, Mafoor, Pulu Faor, Solo Bay!, Dorei, Rubi, Andai, Dorei Hum, Kolokadi, Mt. Arfak, Sorong, Mansinam, Manokwari, Djamna, lake Sentani!, Nacheibe!, Mawes!, lake Jamur!, Manikion river!, Wendesi!, Jaona!, Kaiserin-Augusta river!, Tanah Merah Bay!, Humboldt Bay!, Mimika river, Stekwa river, Utakwa river 2500—3000 feet, Lorentz river!, Tami river, Sattelberg, Friedrich-Wilhelmshafen, Bongu on Astrolabe Bay, Berlinhafen, Seleo Island, Five Bay); Schouten Islands (Mysore); Mios Kairu!; Pegun!; Valise Island. — Ferguson Island; Trobriand Island; Bismarck Archipelago; Solomon Islands; Admiralty Islands; Santa Cruz; Banks; New Hebrides; Polynesia.

95. *Lygosoma mivarti* Boulenger.

*Lygosoma mivarti*, Boulenger, Cat. Liz. III 1887, p. 292, pl. XXIII fig. 1.

*Emoia mivarti*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 94.

Snout pointed; lower eyelid with a transparent disk; ear-opening oval, as large as the palpebral disk, with two or three short lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal more broad than long, forming a broad suture with the rostral and with the frontal; latter almost as long as the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries; frontoparietal single, fused with the interparietal, as long as broad; parietals in contact behind the latter shield; a pair of nuchals and a pair of temporals; four or five labials before the large subocular. Body with 32—44 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time to one time and one fourth in the distance between axilla and groin; praeanales not or feebly enlarged. Tail nearly twice the length of head and body. Limbs strong, the hind limb reaches the axilla or beyond; digits moderate, roundish; fourth toe with 40—45 smooth lamellae below.

Brown or olive above, with black spots, usually forming a dark band on each side of the vertebral region; a light dorso-

lateral band beginning at the eye; flanks black with a light line from the upper lip through the ear to the groin; a short light oblique line on the upper arm. Lower parts greenish or whitish. Length of head and body 48 mm.; tail 82 mm.

*Habitat*: Waigeu!; New Guinea (Djamna, Manokwari, Sorong, lake Sentani!, Manikion river!, Liki!, Jobi, Mios Kairu!, Mios Korwar!, Sermowai river!, Jaona!, Koimé river!, Bégowre river!, Kaiserin-Augusta or Sepik river 1570 M.!, Friedrich-Wilhelmshafen, Bongu on Astrolabe Bay, Bogadjim, Stephansort, Oertzen Mts., Bara Bara, Moroka 2300 feet, Inawi, Albert Edward Range 6000 feet). — Ferguson Island; Trobriand Island; Bismarck Archipelago; Admiralty Islands; Caroline Islands.

96. *Lygosoma méhelyi* Werner.

*Lygosoma mivaroti*, part., Méhely, Termes. Füzetek XXI 1898, p. 169.

*Lygosoma méhelyi*, Werner, Zool. Anz. XXII 1899, p. 371.

Differs from the preceding one on the following points: Frontoparietal and interparietal fused, more long than broad; no auricular lobules; head higher.

Brown above, with small black spots in a dark streak on each side of the vertebral line; flanks with a brownish-black band, confluent with the dark brown colour from the side of the head, this band edged above with a white line or confluent white spots, below with a white streak, beginning at the mouth or the ear. Fingers and claws white. (Not seen by me).

*Habitat*: New Guinea (Stephansort, Bogadjim, Oertzen Mounts, Friedrich-Wilhelmshafen, Sepik river 1570 M.).

97. *Lygosoma callisticum* (Peters & Doria).

*Euprepes (Tiliqua) callisticus*, Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 355.

*Lygosoma callisticum*, Boulenger, Cat. Liz. III 1887, p. 295.

Lower eyelid with a transparent disk; ear-opening oval, vertical, with a few lobules anteriorly. Supranasals present, small; frontonasal more broad than long, in contact with the rostral and with the frontal; latter rhomboidal, pointed behind, a little shorter than the frontoparietal and interparietal together; four supraoculars; frontoparietal single, fused with the interparietal; parietals in contact; fifth or sixth upper labial below the eye. Body with 28 scales round the middle, dorsals and

nuchals strongly bicarinate. Tail a little longer than head and body. Limbs strong, the hind limb reaches the axilla; fourth toe with 38 lamellae below.

Greenish-brown above, with yellowish lines on the back, a median one from the rostral to the nape, continued to the tail, and on each side a line from the supraciliary region, above the ear, along the side of the back. Lower parts greenish. Length of head and body 50 mm.; tail 65 mm.

Habitat: New Guinea (Sorong, Erima, Astrolabe Bay!); Valise Island.

98. *Lygosoma baudini* (Dum. & Bibr.).

*Eumeces baudinii*, Dum. & Bibr., *Erp. Gén.* V 1839, p. 653.

*Lygosoma baudinii*, Boulenger, *Cat. Liz.* III 1887, p. 296 (s. syn.).

*Emoia baudinii*, Barbour, *Mem. Mus. Comp. Zool. Harv. Coll.* XLIV 1912, p. 94.

Snout obtuse, pointed; lower eyelid with a transparent disk; ear-opening oval, slightly larger than the palpebral disk, without or with a few small lobules. Nostril between three shields, a nasal, a postnasal and a supranasal; frontonasal much more broad than long, broadly in contact with the rostral and with the frontal; latter almost as long as the parietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single, fused with the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; four or five labials before the large subocular. Body with 36—40 smooth scales round the middle, sometimes dorsals with two or three keels, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time and one sixth to one time and one third in the distance between axilla and groin; praeanales not or feebly enlarged. Tail one time and a half to one time and two thirds the length of head and body. Limbs strong, the hind limb nearly reaches the elbow; digits short, depressed, the distal part compressed; fourth toe with 30—38 smooth lamellae below.

Olive-brown above, with metallic gloss; sometimes a light dorso-lateral line beginning above the eye; flanks dark brown with whitish spots. Lower parts white or greenish. Length of head and body 68 mm.; tail 80 mm.

Habitat: Buru; Ternate; Waigeu!; New Guinea (Fak Fak, Pulu Faor, Jobi, Mafoor, Yule Island, Dorei, Mansinam, Andai,

Mt. Arfak, Sorong, Mt. Epa, Rubi, Manokwari, lake Sentani!, Moaif!, Tawarin!, Jamur!, Manikion river!, Wendèsi!, Tami river!, Mosso river!, Kaiserin-Augusta river!, Humboldt Bay!, Mimika river, Stekwa river, Utakwa river 2500 feet, Lorentz river!, Hellwig Mts. 1000—1300 M., Astrolabe Bay!, St. Joseph's river district, Haveri, Rigo, Aroma, Inawi, Kelesi, Mt. Victoria in Owen Stanley Range); Schouten Islands (Mysore); Aru Islands. — Ferguson Island.

99. *Lygosoma tropidolepis* Boulenger.

*Lygosoma tropidolepis*, Boulenger, Transact. Zool. Soc. London XX 1914, p. 260, pl. 29 fig. 4.

Snout moderate, obtusely pointed; lower eyelid with a transparent disk; ear-opening round, a little larger than the palpebral disk, with small lobules anteriorly or all round. Nostril between three shields, a nasal, a postnasal and a supranasal; frontonasal much more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter a little longer than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars, seven or eight supraciliaries; frontoparietal single and fused with the interparietal; parietals in contact behind the latter; a pair of nuchals and one or two pair of temporals; four or five labials before the large subocular. Body with 34 or 36 scales round the middle, dorsals and laterals with two to five, generally three, strong, sharp keels; dorsal scales largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time to one time and one fourth in that between axilla and groin; praeanales not enlarged. Tail one time and two thirds the length of head and body. Limbs strong, the hind limb reaches the axilla or the shoulder; digits long, compressed at the end; fourth toe with 34—40 smooth lamellae below.

Dark brown above, iridescent, with small black spots; sometimes an indistinct light dorso-lateral streak; sides with whitish, black-edged spots; labials each with a small, dark, vertical stripe. Lower parts greenish-white. Length of head and body 72 mm.; tail 123 mm.

Type-specimens examined in the British Museum.

Habitat: New Guinea (Mimika river!, Stekwa river!, Utakwa river, Lorentz river!).

100. *Lygosoma pallidiceps* (de Vis).

*Emoia pallidiceps*, de Vis, Proc. Linn. Soc. N. S. Wales (2) V 1890, p. 497.

Snout pyramidal, slightly depressed; lower eyelid with a transparent disk; ear-opening oval, larger than the palpebral disk, with two or three small lobules anteriorly. Nostril between three small shields, a nasal, a postnasal and a supranasal; frontonasal more broad than long, broadly in contact with the rostral, narrowly with the frontal; latter as long as the frontoparietal, narrower, in contact with the two anterior supraoculars; five supraoculars, last very small; seven supraciliaries; frontoparietals and interparietal fused; parietals in contact behind the latter shield; a pair of nuchals and a pair of temporals; four labials before the large subocular. Body slender; 30—34 smooth scales round the middle, dorsals largest, trilineated, laterals smallest; praeanales a little enlarged. Tail twice as long as head and body. Limbs strong, the hind limb reaches the axilla; digits moderate, basal part rounded, distal compressed; fourth toe with 33—40 smooth lamellae below.

Olive-brown above, head and nape paler and usually uniform; back with blackish spots, often arranged in a double line on each side, sometimes separated by lighter coloured spaces; a light dorso-lateral streak, beginning above the eye, to the hind limbs; tail and limbs olive, with pale and black spots; flanks black with a pale streak from axilla to groin and pale-spotted, sometimes white-spotted. Lower parts yellowish-white, stained with green. Length of head and body 50 mm.; tail 100 mm.

Habitat: New Guinea (Lorentz river!, St. Joseph river).

101. *Lygosoma atrocostatum* (Lesson).

*Scincus atrocostatus*, Lesson, Voy. Coquille Zool. II 1830 p. 50, pl. IV fig. 3.

*Lygosoma atrocostatum*, Boulenger, Cat. Liz. III 1887, p. 295 (s. syn.); Rept. &

Batr. of the Malay Penins. 1912, p. 94, 95.

*Lygosoma atrocostatum*, Annandale, J. Asiat. Soc. Bengal (2) I 1905, p. 147.

*Mabuya jerdoniana*, Stoliczka, Journ. Asiat. Soc. Bengal 1870, p. 172.

*Lygosoma jerdonianum*, Boulenger, Cat. Liz. III 1887, p. 300.

*Eumeces singaporensis*, Steind. Sitzb. Ak. Wien LXII I 1870, p. 341, pl. IV, fig. 2.

*Lygosoma singaporense*, Boulenger, Cat. Liz., p. 297.

*Emoia atrocostatum*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 94.

Snout long, obtusely pointed; lower eyelid with a transparent disk; ear-opening oval, as large as or slightly larger

than the palpebral disk, with or without one or two small lobules anteriorly. Nostril between three small shields, a nasal, a postnasal, and a supranasal; frontonasal often a little more broad than long, in contact with the rostral and frequently also with the frontal; latter smaller than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal small but distinct; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; four or five labials before the large subocular. Body with 30—40 smooth scales round the middle, dorsals largest, laterals smallest; the distance between the end of the snout and the fore limb is contained one time and one fifth to one time and one third in the distance between axilla and groin; praeanals feebly enlarged. Tail one time and two thirds the length of head and body. Limbs strong, the hind limb reaches the elbow or the axilla; digits moderate, depressed, the distal part compressed; fourth toe with 35—38 smooth lamellae below.

Greyish or brownish-olive above, with small black and white spots; a black lateral band or series of spots on each side. Lower parts yellowish or greenish. Length of head and body 96 mm.; tail 158 mm.

Habitat: Simalur!; Singkep; Java!; Borneo; Celebes (Gorontalo, Kandari, Buol, Paloppo, near Paguat and Malibagu); Ambon!; Kei Islands; Aru Islands; Ternate!; Halmahera; Waigeu!; New Guinea (Jobi, Mafoor, Ron!; Yule Island, Sorong, Tanah Merah Bay!, Koimé river!, Fly river); Schouten Islands (Mysore). — Cape York; Ferguson Island; Caroline Islands; Santa Cruz Islands; New Hebrides; Christmas Island; Pulu Tikus near Penang; Singapore.

#### 102. *Lygosoma nigrum* Hombr. & Jacq.

*Eumeces niger*, Hombr. & Jacq., Voy. au Pôle Sud, Rept. 1842, p. 11, pl. IV fig. 2.  
*Lygosoma nigrum*, Boulenger, Cat. Liz. III 1887, p. 297 (s. syn.).

Snout long, obtusely pointed; lower eyelid with a transparent disk; ear-opening large, oval, much larger than the palpebral disk, no lobules. Nostril between three shields, a nasal, a postnasal and a supranasal; frontonasal as long as broad, or a little more broad than long, in contact with the rostral and usually with the frontal; latter as long as the frontoparietal, in contact with the two anterior supraoculars;



four supraoculars; seven or eight supraciliaries; frontoparietal single; interparietal usually distinct, small, sometimes absent; parietals in contact; a pair of nuchals and a pair of temporals; sixth and seventh or fifth and sixth upper labials below the eye. Body with 36—40 scales round the middle, smooth or dorsals with five feeble keels, dorsals largest, laterals smallest; the distance between the tip of the snout and the fore limb is contained one time to one time and one fourth in that between axilla and groin; praeanals a little enlarged. Tail one time and a half to one time and three fourths the length of head and body. Limbs strong, the hind limb reaches the axilla or the shoulder; digits long, compressed, fourth toe with 32—40 smooth lamellae below.

Dark brown above, uniform or with dark and light dots, sometimes a black lateral band. Lower parts yellowish or brownish. Length of head and body 128 mm.; tail 170 mm.

Habitat: New Guinea (Valise Island near the coast of German New Guinea). — Solomon Islands; Bismarck Archipelago; Caroline, Fiji, and Samoa Islands.

Note: Peracca mentions *L. nigrum* from Sarawak, Borneo (Revue Suisse Zool. VII 1900, p. 323). This form inhabits the Polynesian Islands and ranges westwards to the Bismarck Archipelago and Valise Island. Peracca's specimen had 5—6 scales in the ear-opening and 47 lamellae under the fourth toe, whereas *L. nigrum* has 32—40 lamellae; probably his specimen is another *Lygosoma*.

### 103. *Lygosoma parietale* (Ptrs.).

*Euprepes (Mabuya) parietalis*, Peters, Mon. Berl. Ak. 1871, p. 572; Ann. Mus.

Civ. Genova III 1872, p. 31, pl. IV fig. 1.

*Lygosoma parietale*, Boulenger, Cat. Liz. III 1887, p. 299.

Snout obtusely pointed; lower eyelid with a transparent disk; ear-opening roundish, moderate. Supranasals small; frontonasal forming a broad suture with the rostral; praefrontals in contact; frontal small, slightly longer than the praefrontal, in contact with the two anterior supraoculars; four supraoculars; eight or nine supraciliaries; frontoparietals fused; interparietal small, but distinct; a pair of nuchals; five labials before the large subocular. Body with 36 smooth scales round the middle; praeanals a little enlarged. Tail one time and one third the length of head and body. Limbs strong, the hind limb reaches

the axilla; digits strong, compressed at the end; fourth toe with 30—38 lamellae below.

Olive above with small blackish spots; sides of back lighter, greenish-grey; sides of body with an irregular black band, light-spotted, beginning at the eye. Lower parts yellowish-green. Length of head and body 85 mm.; tail 112 mm.

Habitat: Borneo (Sarawak!, Kuching, Santubong!, Bruni!).

#### Section Riopa Gray (fig. 91).

Lower eyelid scaly or with a transparent disk; ear distinct; supranasals present. Frontal usually not broader than the supraocular region. Limbs short.

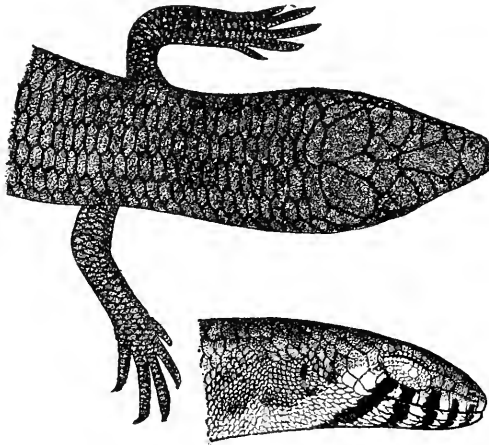


Fig. 91. Section *Riopa*, *Lygosoma rufescens* (Shaw).

#### Key to the Indo-Australian species.

##### A. Praeanals enlarged.

I. Scales smooth, 38—44 round the body; 14—16 lamellae under the fourth toe; frontal broader than supraocular region. . . . 104. *L. bampfyldei* p. 263.

##### II. Scales keeled.

a. Nuchals and temporals present; 26—30 scales round the body; 11—14 lamellae under the fourth toe . . . . . 105. *L. bowringi* p. 264.

b. No nuchals and temporals; 30 scales round the body; 13 lamellae under the fourth toe . . . . . 106. *L. opisthorhodum* p. 265.

*B.* Praeanals not enlarged.

1. Scales smooth, 36 round the middle of the body; 21 lamellae under the fourth toe. Chin and throat with V — shaped black lines . . . . . 107. *L. mentovarium* p. 265.
2. Scales smooth, 34—38 round the body; 21 lamellae under the fourth toe. No black lines on chin and throat. . . . . 108. *L. albofasciolatum* p. 266.
3. Scales smooth or keeled, 28—30 round the body; 16—19 lamellae under the fourth toe. Lower eyelid scaly or with an opaque disk. Young ones with V — shaped black lines on chin and throat. . . . . 109. *L. rufescens* p. 267.

#### 104. *Lygosoma bampfyldei* Bartlett.

*Lygosoma bampfyldei*, Bartlett, Straits Br. Asiat. Soc. XXVIII 1895, p. 96.

*Lygosoma bampfyldei*, Shelford, Straits Br. Asiat. Soc. XXXV 1901, p. 54.

*Lygosoma bampfyldei*, Boulenger, Ann. Nat. Hist. (7) VI 1900, p. 192.

*Lygosoma schneideri*, Werner, Zool. Jahrb. System. XIII 1900, p. 487, pl. XXXI fig. 1.

*Lygosoma schneideri*, Schenkel, Verh. Ges. Basel XIII 1901, p. 191.

*Lygosoma schneideri*, Volz, Zool. Jahrb. System. XIX 1903, p. 430.

Snout obtuse; lower eyelid scaly; ear-opening small, oval, with three lobules anteriorly. Supranasals present, in contact behind the rostral; a distinct postnasal; frontonasal much more broad than long, forming a broad suture with the frontal; praefrontals small, separated; frontal a little longer than frontoparietals and interparietal together, broader than the supraocular region <sup>1)</sup>, in contact with the two anterior supraoculars; four supraoculars; six to eight supraciliaries; frontoparietals larger than the interparietal; parietals in contact behind the latter; no nuchals; a pair of temporals; seven upper labials, two anterior largest, fourth to sixth bordering the eye. Body long, the distance between the tip of the snout and the fore limb is contained one time and three fourths to two times in the distance between axilla and groin; 38—44 smooth scales round the middle; praeanals feebly enlarged. Tail very thick, almost three fourths the length of head and body. Limbs very short, the hind limb is contained two times and a half in the distance between axilla and groin; digits short, compressed, fourth toe

1) This species forms a connection between the sections *Riofa* and *Lygosoma*.

slightly longer than third, with 14—16 obtusely keeled lamellae below.

Yellowish-brown above; head dark brown with a light band across the occiput; sides of head yellow, brown below the eye and the ear-opening; tail olive. Lower parts yellowish. Length of head and body 131 mm.; tail 96 mm.

Type-specimen examined in the British Museum.

Habitat: Sumatra (Indragiri, Palembang); Borneo (Rejang river!). — Larut Hills in Perak.

### 105. *Lygosoma bowringii* (Gthr.).

*Eumeces bowringii*, Günther, Rept. Brit. Ind. 1864, p. 91.

*Euprepes (Riopa) punctatostriatus*, Peters, Mon. Berl. Ac. 1871, p. 31.

*Lygosoma bowringii*, Boulenger, Cat. Liz. III 1887, p. 308, pl. XXIII, fig. 3.

*Lygosoma whiteheadi*, Mocquard, Le Natural. XII 1890, p. 144; Nouv. Arch. Mus. (3) II 1890, p. 134, pl. VIII fig. 3.

Snout short, obtuse; lower eyelid scaly; ear-opening small, round. Supranasals present, in contact; frontonasal much more broad than long, broadly in contact with the frontal; prae-frontals small; frontal as long as frontoparietals and interparietal together, in contact with the two anterior supraoculars; four supraoculars; seven supraciliaries, first and last largest; frontoparietals longer than interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; fourth or fifth upper labial largest, bordering the orbit. Body long, the distance between the tip of the snout and the fore limb is contained one time and a half to two times in the distance between axilla and groin; 26—30 scales round the middle, almost equal, dorsals feebly tricarinate or almost smooth; prae-anals a little enlarged. Tail thick, slightly longer than head and body. Limbs short, the hind limb about three fifths the distance between axilla and groin; digits moderate, compressed, fourth toe a little longer than third, with 11—14 keeled lamellae below.

Yellowish-brown above, each dorsal scale with a brown spot, the spots forming longitudinal lines; a dark brown dorso-lateral band, edged above with yellowish; flanks pink to vermilion, spotted with dark and whitish. Lower parts yellowish. Length of head and body 55 mm.; tail 65 mm.

Type-specimen of *L. whiteheadi* examined in the Paris Museum.

Habitat: Java; Borneo! (Kina Balu, Kuching, Upper Rejang river, Sarawak, Labuan, Gaya Island); Celebes (Buol, Macassar); Buton. — Malacca; Siam; Burma; Hongkong.

106. *Lygosoma opisthorhodum* Werner.

*Lygosoma (Riopa) opisthorhodum*, Werner, Mitt. Naturh. Mus. Hamburg XXVII 1910, p. 45.

Snout short; lower eyelid scaly; ear-opening small, round. Supranasals present, forming a median suture; frontonasal broadly in contact with the frontal; latter more than one time and a half as long as broad, in contact with the two anterior supraoculars; four supraoculars; frontoparietals and interparietal distinct; parietals forming a suture behind the latter; no temporals; fourth or fifth upper labial below the eye. Body with 30 scales round the middle, dorsals and laterals tricarinate, ventrals smooth, in 10 longitudinal series; praeanales feebly enlarged. Tail slightly longer than head and body. Limbs short, not meeting when adpressed; fourth toe with 13 lamellae below.

Blackish-brown above, posteriorly somewhat lighter; tail reddish-brown; a light stripe beginning at the frontal, passing along the upper eyelid to the flanks, where it is lost; lower labials brown. Lower parts yellowish-brown. Length of head and body 93 mm.; tail broken. (After Werner, not seen by me.)

Habitat: Sumatra (Bandar Kwala, Sungei Lalah in Indragiri).

107. *Lygosoma mentovarium* Boettger.

*Lygosoma mentovarium*, Boettger, Zool. Anz. XVIII 1895, p. 119; Abh. Senck. Ges. XXV 1900, p. 345, Taf. XIV fig. 4.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, with five lobules anteriorly. Nostril between the nasal and the supranasal; frontonasal more broad than long, narrowly in contact with the rostral, broadly with the frontal; praefrontals small; frontal shorter than frontoparietal and parietal together, in contact with the two anterior supraoculars; five supraoculars, last very small; eight supra-ciliaries; frontoparietals slightly shorter than the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; sixth upper labial largest, below the eye, separated from the latter by a series of small scales.

Body moderate; the distance between the tip of the snout and the fore limb is contained about one time and one third in the distance between axilla and groin; 36 smooth scales round the middle, subequal; praeanals not enlarged. Tail thick, more than one time and a half as long as head and body. Limbs short, not meeting when adpressed; digits short, compressed, fourth toe with 21 obtusely keeled lamellae below.

Brown above, with opaline gloss and about seven indistinct blackish cross bands; lips with black bands, continued as V-shaped lines on the throat; sides of nape with black spots; flanks with indistinct light and dark dots and stripes. Lower parts whitish. Length of head and body 117 mm.; tail 185 mm. (After Boettger, not seen by me).

Habitat: Halmahera; Ternate? (Boettger supposed, that the specimen of *L. rufescens*, mentioned by Peters & Doria, Ann. Mus. Civ. Genova XIII 1878, p. 350 belongs to this species).

#### 108. *Lygosoma albofasciolatum* (Gthr.).

*Eumeces albofasciolatus*, Günther, Ann. Mag. Nat. Hist. (4) X 1872, p. 370.  
*Lygosoma albofasciolatum*, Boulenger, Cat. Liz. III 1887, p. 302, pl. XXIV.

Snout short, obtuse; lower eyelid scaly; ear-opening oval, smaller than the eye-opening, with a series of lobules anteriorly. Nostril between the nasal and a small supranasal; frontonasal more broad than long, forming a broad suture with the rostral and with the frontal; praefrontals small; frontal as long as frontoparietals and parietals together, in contact with the two anterior supraoculars; five supraoculars, last very small; eight supraciliaries; frontoparietals longer than interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; sixth labial largest, below the eye, from which it is separated by a series of small scales. Body long, the distance between the end of the snout and the fore limb is contained one time and two thirds or one time and three fourths in the distance between axilla and groin; 34—38 smooth scales round the middle, dorsals feebly enlarged; praeanals not enlarged. Tail thick. Limbs short, not meeting when adpressed; digits short, compressed, fourth toe with 21 smooth lamellae below.

Dark brown above, with strong opaline gloss and yellowish-brown cross bands. Lower parts yellowish-white. Length of head and body 200 mm.

Habitat: New Guinea (Bukaua in Kaiser-Wilhelmsland). — Ferguson Island; Queensland; Bismarck Archipelago; Solomon Islands; Rossel Island; Caroline and Sta. Cruz Islands.

109. *Lygosoma rufescens* (Shaw).

*Lacerta rufescens*, Shaw, Zool. III 1802, p. 285.

*Lygosoma rufescens* Boulenger, Cat. Liz. III 1887, p. 303 (s. syn.).

*Rioha rufescens*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 95.

Snout short, obtuse; lower eyelid scaly, sometimes with an opaque disk; ear-opening oval, smaller than the eye-opening,

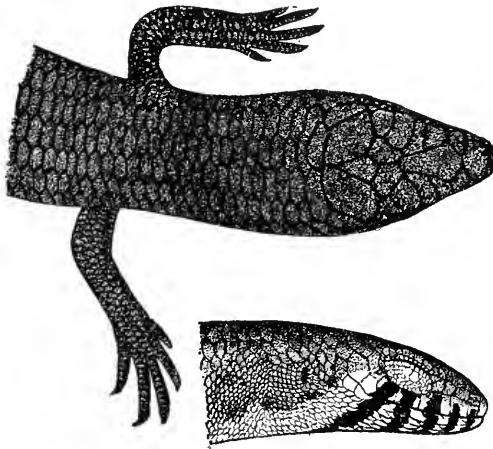


Fig. 92. *Lygosoma rufescens* (Shaw).

with short lobules anteriorly. Nostril between the nasal and a supranasal; frontonasal more broad than long, forming a broad suture with the rostral and with the frontal; praefrontals small; frontal as long as or somewhat shorter or longer than frontoparietals and parietals together, in contact with the two anterior supraoculars; five supraoculars, last very small; eight or nine supraciliaries, first largest; frontoparietals shorter than the interparietal; parietals in contact behind the latter; a pair of nuchals and a pair of temporals; fifth labial largest, below the eye, separated from it by a series of scales. Body long, the distance between the end of the snout and the fore limb is contained nearly twice in the distance between axilla and groin; 28—30 scales round the middle, smooth or in young specimens quinquecarinate, the two dorsal series largest; prae-

anals not enlarged. Tail thick, one time and a half to one time and two thirds the length of head and body. Limbs short, not meeting when adpressed, or just meeting in the young; digits short, compressed, fourth toe with 16—19 smooth lamellae below.



Fig. 93. *Lygosoma rufescens* (Shaw).  
Young specimen.

Brown above with strong opaline gloss, sometimes dark transverse bands; lips often with black vertical bars. Lower parts yellowish. Young specimens are dark brown with numerous narrow, white transverse bands; lips barred with black and white, the bars continued on the throat, where they form V-shaped lines with their fellows from the other side; tail yellowish-brown; limbs brown with white cross bands (fig. 93). Length of head and body 143 mm.; tail 240 mm.

Habitat: Ternate<sup>1)</sup>; Salibabu Islands!; Ceram; Ambon; Timor Laut; Aru Islands; New Guinea (Mafoor, Djamna, Fak Fak, Mansinam, Dorei, Rubi, lake Sentani!, Pauwi, Manokwari!, Mimika river, Stekwa river, Lorentz river!, Fly river, Sattelberg, Torricelli Mts. 300 M., Seleo Island, Aroma, Haveri, Bara Bara, Hula); Schouten Islands (Mysore). — Islands of Torres Straits; Cape York; Ferguson Island.

1) Perhaps the specimen mentioned by Peters & Doria from this island belongs to *Lygosoma mentovarium* Boettger, s. p. 266.



Section *Siaphos* Gray (fig. 94).

Lower eyelid scaly or with a transparent disk; ear-opening hidden or very small; no supranasals. Praefrontals small or absent; frontal not broader than the supraocular region. Limbs short.

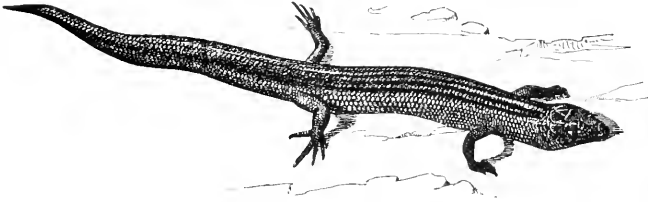


Fig. 94. Section *Siaphos*. *Lygosoma relictum* Vincig.

## Key to the Indo-Australian species.

- A.* Lower eyelid with a transparent disk.
- I. The adpressed hind limb reaches the wrist;  
22 scales round the body; 20—25 lamellae  
under the fourth toe . . . . . 110. *L. infralineolatum* p. 269.
  - II. The adpressed hind limb does not reach  
the fore limb; 20—22 scales round the  
body; 18 lamellae under the fourth toe . 111. *L. relictum* p. 270.
- B.* Lower eyelid scaly; 18—20 scales round  
the body . . . . . 112. *L. quadrivittatum* p. 271.

110. *Lygosoma infralineolatum* (Gthr.).

*Cophoscincus infralineolatus*, Günther, Proc. Zool. Soc. London 1873, p. 166.

*Lygosoma infralincolatum*, Boulenger, Cat. Liz. III 1887, p. 328, pl. XXVII, fig. 1.

Snout pointed, depressed; lower eyelid with an undivided transparent disk; ear hidden under the scales, indicated by a depression. Nostril in the nasal; no supranasal; frontonasal slightly more broad than long, in contact with the rostral and with the frontal; praefrontals small and separated; frontal longer than the frontoparietal, in contact with the two anterior supraoculars; four supraoculars, first and fourth longest; seven to nine supraciliaries; frontoparietal single; interparietal distinct, almost as large as the frontal; parietals in contact behind the interparietal; two or three pair of nuchals; fourth and fifth or fifth and sixth upper labials largest, below the eye. 22 smooth scales round the body, the two vertebral series enlarged; the

distance between the end of the snout and the fore limb is contained one time and two fifths to one time and a half in the distance between axilla and groin; a pair of enlarged praeanales. Tail as long as head and body. Limbs short, the hind limb reaches the wrist, or just touches the fore limb; digits compressed at the end, with smooth lamellae below, 18—25 under the fourth toe.

Yellowish above, with four black longitudinal bands, the median pair beginning at the supraoculars, the lateral at the eyes, or dark brown with three light stripes on the back; lips, sides of neck, and limbs brown-spotted; digits with dark cross bars; tail brown-spotted, the spots sometimes forming short vertical bars on each side. Lower parts sometimes with brown longitudinal lines between the series of scales. Length of head and body 49 mm.; tail 46 mm.

Habitat: Celebes (Manado!, Dumoga besar, Kema!, Buol!, Bungi, Sosso, Macassar!); Sanghir Islands (Siao!).

### 111. *Lygosoma relictum* Vincig.

*Lygosoma* (*Siaphos*) *relictum*, Vinciguerra, Ann. Mus. Civ. Genova (2) XII 1892, p. 524.

Lower eyelid with a transparent disk; ear covered with scales, its presence indicated by a depression. Nostril in the

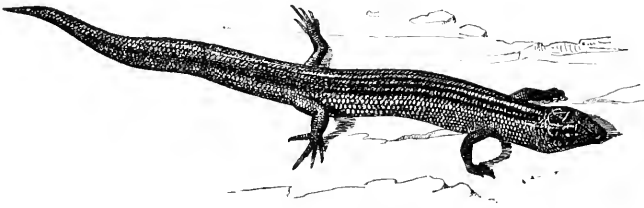


Fig. 95. *Lygosoma relictum* Vincig.

nasal; no supranasal; frontonasal in contact with the rostral and the frontal; praefrontals small, separated; frontal longer than its distance from the tip of the snout; four supraoculars; frontoparietal single, as long as the interparietal; parietals large, forming a short suture behind the interparietal; a pair of temporals and three pair of nuchals; fourth upper labial below the centre of the eye. Body long; 20—22 smooth scales round the middle of the body; praeanales enlarged. Tail thick, longer than head and body. Limbs short, not meeting when

adpressed; hind limb as long as the distance between the nostril and the fore limb; digits slender, fourth toe longest, with 18 lamellae below.

Brown above, with four longitudinal black lines; a light vertebral stripe beginning between the eyes; labials with a small median white spot. Lower parts light brown. Length of head and body 56 mm.; tail 73 mm.

Habitat: Simalur!; Nias!; Mentawai Islands (Sipora); Engano.

#### 112. *Lygosoma quadrivittatum* Peters.

*Lygosoma (Cophoscincus) quadrivittatum*, Peters, Mon. Berl. Ak. 1867, p. 19 and 1872, p. 583.

*Lygosoma quadrivittatum*, Boulenger, Cat. Liz. III 1887, p. 329.

Snout short, pointed; lower eyelid scaly; ear hidden under the scales. Nostril in the nasal; no supranasal; frontonasal in contact with the rostral and with the frontal; praefrontals small and separated; frontal small and pointed behind, in contact with the two anterior supraoculars; four supraoculars; eight supraciliaries; frontoparietal single; interparietal distinct; parietals in contact behind the latter; three pair of nuchals; fifth upper labial largest and bordering the orbit. 18—20 smooth scales round the body, dorsals largest; the distance between the end of the snout and the fore limb is contained one time and three fifths in that between axilla and groin; two prae-anals enlarged. Tail thick, a little shorter than head and body. Limbs short, overlapping when adpressed; digits slender, fourth toe longest, with 15 or 16 lamellae below.

Yellowish above, with four black longitudinal bands, the median one reaching the supraoculars, the laterals the eyes; lips, chin, sides of head and neck spotted with black; digits with black cross bars; tail dark-spotted, the spots sometimes forming short vertical bars on each side. Lower parts yellowish-white. Length of head and body 37 mm.; tail 35 mm.

Habitat: Borneo (Sandakan!); Celebes (Gorontalo). — Philippines; Malacca.

#### 4. *Ablepharus* Fitzinger.

(FITZINGER, Verh. Ges. Naturf. Fr. I p. 297, 1824).

Pterygoids in contact, the palatal notch not extending to between the centre of the eyes (fig. 67*b*); pterygoids without

teeth; maxillary teeth conical. Eyelid immovable, transparent, covering the eye; ear distinct or hidden. Nostril in the nasal; supranasal present or absent. Limbs distinct.

Distribution. South-Eastern Europe; Southern Asia; Australia; tropical and South-Africa.

A single species.

1. *Ablepharus boutoni* (Desjard.).

*Scincus boutonii*, Desjardins, Ann. Sc. Nat. XXII 1831, p. 298.

*Ablepharus boutonii*, Boulenger, Cat. Liz. III 1887, p. 346 (s. syn.).

*Cryptoblepharus boutonii*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 96, pl. 3 fig. 5, 7, 8.

Snout pointed, eye surrounded by granules; upper eyelid consisting of three or four large scales, lower covering the

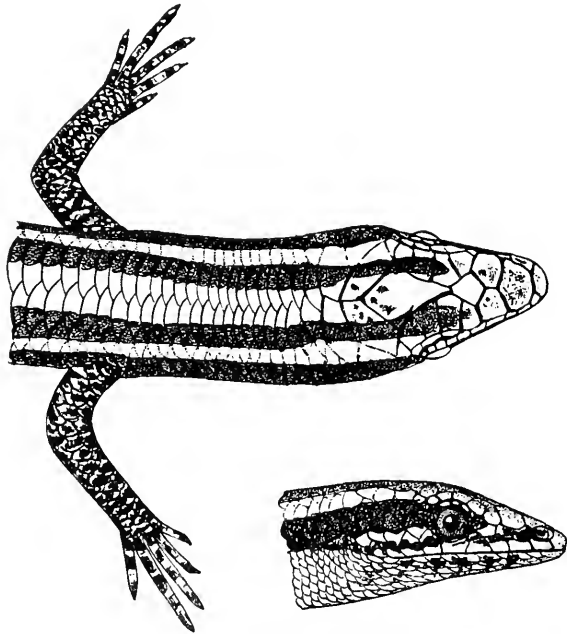


Fig. 96. *Ablepharus boutoni* (Desj.).

eye, transparent; ear-opening round, small, about half the diameter of the eye-opening. Nostril in the nasal; no supranasals; frontonasal as long as broad, in contact with the rostral; praefrontals in contact or slightly separated; frontal small, not longer than the frontonasal, in contact with the two anterior supraoculars, in contact with the interparietal or

separated from it; latter large, fused with the frontoparietals; five supraoculars, second largest, last smallest; five or six supraciliaries; parietals in contact; a pair of nuchals and a pair of temporals. 20—28 scales round the body, smooth or slightly striated, dorsals largest, the two median series often transversely dilated. Tail longer than head and body. Limbs strong, pentadactyle; the hind limb reaches the axilla or nearly so far; digits long and slender, with smooth lamellae below.

Olive, brown or greenish above, with light and black longitudinal lines. Length of head and body 43 mm.; tail 62 mm.

Habitat: Indo-Australian Archipelago; Australia; Polynesia; tropical parts of America and Africa, S. Africa.

With relation to the number of scales and the coloration, the following subspecies may be distinguished.

a. *boutoni* Desj.

*Scincus boutonii*, Desjardins, Ann. Sc. Nat. XXII 1831, p. 298.

26 (24 or 28) scales round the body; fifth or sixth upper labial below the eye. Olive above, spotted or marbled with black, with an indistinct light lateral band.

New Guinea (Aroma); Flores!. — Mauritius.

b. *poecilopleurus* Wiegmann.

*Ablepharus poecilopleurus*, Wiegmann, Nova Acta Ac. Leop.-Carol. XVII 1835, p. 202, pl. VIII fig. 1.

28 (26) scales round the body; fifth labial below the eye. Brown or olive above, spotted or marbled with black, with a light lateral band; limbs and sides light-dotted.

New Guinea (Hula, Aroma). — Sandwich Islands; Savage Islands; Bahia.

c. *peroni* Coct.

*Cryptoblepharis peronii*, Cocteau, Et. Scinc. p. 1.

22 or 24 (26) scales round the body; fifth labial below the eye. Brown or greenish above, with a light, greenish lateral band, edged on both sides with black, the inner black line broad, covering about half the vertebral series of scales; flanks dark with light spots; limbs and tail spotted with brown and light. Lower parts greenish.

Java; Timor; Samoa; Timor Laut; Aru Islands; Buru;

Ambon; Waigeu!; New Guinea (Jobi, Mafoor, Yule Island, Sorong, Ramoi, Humboldt Bay!, Manikion river!, Merauke!, Fly river, Fife Bay, Hula, Aroma, Bara Bara). — Pelew Islands; Murray Island, Islands of Torres Straits; W. Australia; Adelaide; Tasmania; New Caledonia; Loyalty Islands; New Hebrides; Samoa; Society and Fiji Islands; Central and S. Africa.

d. *rutilus* Ptrs.

*Ablepharus rutilus*, Peters, Sitz. Ges. Naturf. Freunde 1879, p. 37.

20 scales round the body; rest like the preceding one.  
New Guinea (Fly river!, Aroma!).

e. *quinquetaeniatus* Gthr.

*Ablepharus quinquetaeniatus*, Günther, Proc. Zool. Soc. 1874, p. 296.

*Ablepharus boutoni* var. *Keiensis*, Roux, Abh. Senckenb. Ges. XXXIII 1910, p. 240, Taf. XIII fig. 3.

24 scales round the body (young ones 22); fifth upper labial below the eye. Black above, with five very distinct whitish or greenish longitudinal lines, a median one from the frontal to the base of the tail, two latero-dorsals, beginning at the supraciliary region, continued along the sides of the tail as zigzag lines or series of spots; the outer ones narrowest, from the subocular, through the ear, along the flanks to the hind limbs. Limbs light-spotted. Lower parts greenish.

Sumba!; Ambon; Ceram; Kei Islands!. — W. Africa.

f. *furcata* M. Web.

*Ablepharus boutoni* var. *furcata*, M. Weber, Zool. Ergebn. Reise N. O. Ind. I 1890/91 p. 174.

*Cryptoblepharus boutonii balinensis*, Barbour, Proc. Biol. Soc. Wash. XXIV 1911, p. 18; Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 96, pl. 3 fig. 8.

24 or 26 scales round the body; fifth upper labial below the eye. Black above, with four longitudinal greenish bands on the back, of which the two median ones fuse between the fore limbs and the ear extending to the rostral; the latero-dorsal bands begin at the nostril and extend, above the eye, to the tail; on each side a light lateral band from the labials, through the ear-opening to the hind limb; flanks blackish. Limbs blackish-brown, light-spotted; tail dark, with two longitudinal greenish streaks. Lower parts greenish.

Bali; Flores!; Lomblem!; Ombaai (Alor); Damma.  
Type-specimens examined in the Amsterdam Museum.

g. *cursor* Barbour.

*Cryptoblepharus boutonii cursor*, Barbour, Proc. Biol. Soc. Wash. XXIV 1911, p. 18; Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 96, pl. 3 fig. 5.

26 scales round the body; fifth or sixth upper labial below the eye. Pale greenish olive above, with a narrow dark line not covering the vertebral series of scales or only covering the outer borders on each side, the two meeting at the base of the tail and disappearing there. A silvery white lateral band, beginning above the eye and continued to the base of the tail; this band bordered at the outer side by another black line, white-spotted, from behind the eye to the sides of the tail, where it breaks up into spots and soon disappears; flanks light with a few small dark spots. Lower parts silvery-white. Limbs dark-spotted; tail light olive-green, brownish-green towards the tip.

Lombok; Paternoster Islands!.

### 5. *Tropidophorus* Dum. & Bibr.

(DUM. & BIBR. Erp. Gén. V p. 554, 1839).

Palatines and pterygoids in contact in the middle of the palate, which has no teeth. Teeth conical. Eyelids distinct, scaly; tympanum distinct, superficial. Nostril in the nasal; no supranasals; praefrontals well developed; frontoparietal single or double; interparietal distinct. Limbs strong, pentadactyle; digits slightly compressed, with transverse lamellae below.

Distribution. S. China; Indo-China; Philippines; Borneo; Celebes.

### Key to the Indo-Australian species.

A. Frontonasal single; one large praeanal scale; ventral scales smooth.

I. Dorsal scales smooth.

a. 30 scales round the body. . . . . 1. *T. beccarii* p. 276.

b. 34 scales round the body. . . . . 2. *T. mocquardi* p. 276.

II. Dorsal scales keeled.

I. Dorsal scales with one keel.

a. 32 scales round the body . . . . . 3. *T. brookei* p. 277.

b. 34 scales round the body . . . . . 4. *T. micropus* p. 277.

2. Dorsal scales with a groove and two keels;  
 34 scales round the body . . . . . 5. *T. iniquus* p. 278.  
*B.* Frontonasal divided; three large praeanales; ventral  
 scales keeled . . . . . 6. *T. grayi* p. 279.

### 1. *Tropidophorus beccarii* (Ptrs.).

*Amphixestus beccarii*, Peters, Mon. Berl. Akad. 1871, p. 574.  
*Tropidophorus beccarii*, Boulenger, Cat. Liz. III 1887, p. 360.

Shields of head smooth; frontonasal single, slightly more broad than long; praefrontals in contact; frontal as long as frontoparietals and interparietal together or a little longer; five supraoculars, first longest, fifth smallest, fourth bordering the eye; six or seven supraciliaries anterior to the fourth supraocular; frontoparietals shorter than the interparietal; parietals forming a suture behind the latter. Seven upper labials, fifth and sixth largest and bordering the orbit; five lower labials; a large postmental. Tympanum smaller than the eye-opening. Body slender, with 30 smooth scales round the middle, ventrals largest. Praeanal region covered with a single large plate. Tail slightly compressed, one time and two fifths the length of head and body, with smooth scales. Limbs rather long and slender, the hind limb reaches the wrist or beyond; digits short, with smooth lamellae below.

Reddish-brown above, with dark transverse bands or alternating spots; flanks white-spotted. Lower parts yellowish; throat dark-spotted. Length of head and body 80 mm.; tail 106 mm.

Habitat: Borneo (Matang, Sarawak, Akar river, Baram river, Bidi, Howong river!).

### 2. *Tropidophorus mocquardi* Boulenger.

*Tropidophorus beccarii*, part., Mocquard, Nouv. Arch. Mus. (3) II 1890, p. 135.  
*Tropidophorus mocquardii*, Boulenger, Proc. Zool. Soc. 1894, p. 735.

Head large, swollen at the temples; head-shields smooth; frontonasal single; praefrontals in contact; frontal a little longer than frontoparietals and interparietal together; five supraoculars; frontoparietals shorter than the interparietal; parietals in contact; seven upper labials, fifth and sixth largest and below the eye, five lower labials; postmental smaller than in the preceding species, followed by two pair of shields. Tympanum smaller than the eye-opening. Body slender, with



34 smooth scales, ventrals largest. Praeanal region covered with one plate. Tail compressed, not quite one time and a half the length of head and body. Limbs strong; digits rather short, with smooth lamellae below.

Brown above, with dark transverse bands; flanks white-spotted. Lower parts whitish. Length of head and body 95 mm.; tail 107 mm.

Type-specimens examined in the Paris and British Museums.

Habitat: Borneo (Kina Balu!, Bidi in Sarawak!).

### 3. *Tropidophorus brookei* (Gray).

*Norba brookei*, Gray, Cat. 1845, p. 102.

*Tropidophorus brookii*, Boulenger, Cat. Liz. III 1887, p. 361.

Shields of head slightly rugose; frontonasal single, about as broad as long; praefrontals in contact; frontal as long as frontoparietals and interparietal together; five supraoculars, first longest, fifth smallest; fourteen very small supraciliaries, of which the last are indistinct; frontoparietals shorter than the interparietal; parietals forming a suture behind the latter; eight upper labials, fifth and sixth largest and bordering the orbit; five lower labials; a postmental. Tympanum smaller than the eye-opening. Body slender, with 32 scales round the middle, dorsals and laterals equal, keeled, with round hind border, the keels forming eight longitudinal lines on the back and oblique ones on the flanks. Ventral scales largest and smooth. Praeanal region covered with a large plate. Tail slightly compressed, about twice as long as the body, the upper scales keeled. Limbs slender, the hind limb reaches the elbow or the axilla; digits short, with smooth lamellae below.

Brown above, with darker and lighter spots, the dark spots sometimes forming transverse bands; flanks dotted with black and white; tail dark brown. Lower parts whitish. Length of head and body 88 mm.; tail 155 mm.

Habitat: Borneo (Baram river, Akar river, Santubong, Pangkalan ampat, Mt. Dulit, Kuching, Matang, Sarawak, Nanga Raun!, Sandakan, Lawas in Bruni).

### 4. *Tropidophorus micropus* Lidth.

*Tropidophorus micropus*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 201.

Shields of head strongly striated; snout long, pointed; frontonasal single, as long as broad; praefrontals in contact; frontal

longer than frontoparietals and interparietal together, in contact with three supraoculars; four supraoculars; seven supraciliaries anterior to the fourth supraocular, first and second large, the others small; frontoparietals shorter than interparietal; parietals forming a suture behind the latter. Six upper labials, fourth largest, with a groove from the lower posterior corner to the upper anterior one, bordering the orbit; five lower labials; a postmental, followed by three pair of shields, the first and second in contact, third separated by four scales. Tympanum oval, larger than the eye-opening. Body slender, with 34 scales round the middle, dorsals strongly keeled, with a sharply pointed hind border, the keels forming six longitudinal lines; lateral scales smaller, keeled, forming oblique series. Ventral scales as large as dorsals, smooth, in 6 series; scales of the chin smooth, those on the throat keeled, the two middle rows excepted. Praecanal region with one large plate. Tail with keeled scales, the middle lower series of broad shields smooth. Limbs slender, the hind limb reaches the fingers; digits with smooth lamellae below.

Brown above, marked with lighter; a broad yellow spot on the sacral region. Lower parts lighter, marbled with dark on chin, throat and tail. Length of head and body 40 mm.; tail 48 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Long Bloe on Upper-Mahakkam river!).

Only one specimen known.

##### 5. *Tropidophorus iniquus* Lidth.

*Tropidophorus iniquus*, v. Lidth de Jeude, Notes Leyden Mus. XXV 1905, p. 199.

Shields of head rugose; snout long, pointed; frontonasal single, much more long than broad; praefrontals separated; frontal as long as frontoparietals, interparietal and parietals together; five supraoculars, first longest, fifth smallest; six supraciliaries anterior to the fourth supraocular, the seventh in contact with it; frontoparietals shorter than the interparietal; parietals in contact behind the latter. Eight upper labials, fifth largest, bordering the eye; five lower labials; a large postmental, followed by two pair of shields forming a suture, and a third pair, much smaller, separated by four scales. Tympanum oval, smaller than the eye-opening. Body slender, with 34 scales

round the middle, ventrals largest. Dorsal scales with a groove in the middle, flanked on each side by a swollen band; nuchal scales with three swollen bands separated by two grooves. Praeanal region with one large plate. Tail thick. Limbs slender, the hind limb reaches beyond the wrist; digits with smooth lamellae below.

Greyish-brown above, with indistinct blackish transverse markings on back and tail. Lower parts white, posterior part of tail and scales of the feet darker. Length of head and body 96 mm.; tail (mutilated) 82 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Borneo (Upper-Kajan river!).

Only one specimen known.

#### 6. *Tropidophorus grayi* Gthr.

*Tropidophorus grayi*, Günther, Proc. Zool. Soc. London 1861, p. 189.

*Tropidophorus grayi*, Boulenger, Cat. Liz. III 1887, p. 364.

Shields of head strongly striated; frontonasal divided, more long than broad; an azygos shield between the frontonasals and



Fig. 97. *Tropidophorus grayi* Gthr.

the praefrontals present or absent; latter in contact; frontal as long as or somewhat shorter than frontoparietals and interparietal together; four supraoculars, first longest, fourth bordering

the eye; five or six supraciliaries anterior to the fourth supraciliary; frontoparietals much shorter than interparietal; parietals not in contact behind the latter; seven upper labials, fifth largest and bordering the orbit; five lower labials; postmental sometimes divided, followed by three pair of shields, all separated. Tympanum as large as the eye-opening. Body slender, with 24—28 scales round the middle, dorsals in six longitudinal series largest, strongly keeled, with a sharply pointed hind border; laterals much smaller, keeled, in oblique series. Ventral scales larger than laterals, keeled; gular scales keeled. Praeanal region with three large plates. Tail compressed, slightly longer than head and body, with keeled scales, the upper rows with stronger keels than the dorsals, spinose. Limbs slender, the hind limb reaching the elbow or the axilla; digits with keeled lamellae below.

Brown above with transverse lighter bands or spots. Lower parts yellowish, throat sometimes darker. Length of head and body 82 mm.; tail 100 mm.

Habitat: Celebes (Luhu!, Makassar). — Philippines.

#### 6. *Tribolonotus* Dum. & Bibr.

(DUM. & BIBR. *Exp. Gén.* V p. 364, 1839).

Palatine bones in contact in the middle of the palate, which has no teeth. Teeth conical. Eyelids distinct, scaly; tympanum distinct, superficial. Nostril in the nasal; no supranasals; no praefrontals; frontoparietals and interparietal distinct. Head well separated from the neck, bony. Neck and body covered above with transverse rows of large bony shields, ending in spines; sides granular; ventral scales imbricate, keeled. Limbs strong, pentadactyle; digits slightly compressed, with transverse lamellae below.

Distribution. New Guinea.

#### Key to the Indo-Australian species.

- A. Spines of the tail pointing upwards; first pair of chin-shields as long as postmental, followed on each side by four smaller shields, gradually decreasing in size . . . . . 1. *T. novae-guineae* p. 281.
- B. Spines of the tail pointing backwards; first pair of chin-shields much longer than postmental, followed by four shields, much smaller than the first; a red half-ring under the orbit . . . . . 2. *T. gracilis* p. 281.

### 1. *Tribolonotus novae-guineae* (Schleg.).

*Zonurus novae-guineae*, Schlegel, Tijdsch. Nat. Gesch. Phys. I 1834, p. 218.

*Tribolonotus novae-guineae*, Boulenger, Cat. Liz. III 1887, p. 365 (s. syn.).

Head strongly separated from neck, with a straight posterior border ending in six points. Eyelids scaly; tympanum as large as the eye-opening, superficial. Shields of head strongly striated; rostral small; four supraoculars; two pair of parietals, hind pair largest and forming a suture behind the interparietal. Six upper labials, first very small, second long, third and fourth bordering the orbit; five lower labials, first longest; mental very small, followed by a large postmental; five chin-shields on each side, gradually decreasing in size; first pair as long as the postmental. Body slender, covered on the back, from the neck to the sacrum with 11 transverse rows of large, bony shields, each series composed of four spinose shields, the outmost sharp and strongly curved. Between the shields the body is covered with small, soft, keeled scales. Flanks with small scales and scattered, larger trihedral tubercles. Throat and belly covered with strongly keeled, imbricate scales. Prae-anal scales strongly enlarged. Tail somewhat compressed, as long as head and body, covered above with large spinose shields, the spines pointing upwards, alternating with rows of small keeled scales; below with transverse rows of strongly keeled, imbricate scales. Limbs strong, the hind limb nearly reaches the axilla; the fore limb covered with rather large, strongly keeled scales, the hind limb with spinose scales; digits roundish, short, with smooth lamellae below, those of the basal part thicker.

Dark brown above, banded with lighter; lower parts yellowish. Length of head and body 80 mm.; tail 82 mm.

Habitat: New Guinea (Fak Fak, Passim, Lobo, Andai, Haas, Wendesi!, Ingsiim river!, Humboldt Bay!, Mosso, Germaniabucht, Bukaua, Bongu, Astrolabe Bay!, Friedrich-Wilhelmshafen, Torricelli Mts., Etna Bay!, Mimika river); Valise Island.

### 2. *Tribolonotus gracilis* de Rooy.

*Tribolonotus gracilis*, de Rooy, Nova Guinea Zool. V 1909, p. 381.

*Tribolonotus novae-guineae*, Vogt, Sitz. ber. Ges. Naturf. Fr. Berlin 1911, p. 415.

Head as in the preceding species; first pair of chin-shields

much longer than the postmental, followed on each side by four shields, much smaller than the first. Body more slender than in *Tr. novae-guineae*, with 10—13 transverse rows of spinose shields. Gular and ventral scales with a low keel. Spines

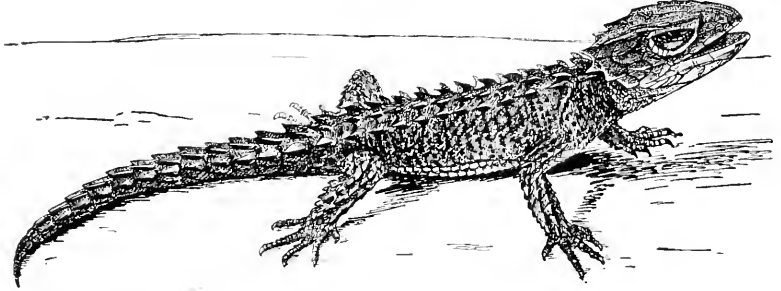


Fig. 98. *Tribolonotus gracilis* de Rooy.

of the tail very low, pointing backwards. Hind limb reaching the axilla. Rest like the preceding species.

Dark brown above; lower parts yellowish; the orbit bordered inferiorly by a red half-ring. Length of head and body 93 mm.; tail 91 mm.

Habitat: New Guinea (Sermowai river!, Humboldt Bay!, Moso river!, Germaniabucht).

#### 9. Fam. DIBAMIDAE.

Body vermiform, covered with cycloid, imbricate scales. Head with large shields. Tongue short, pointed anteriorly, bifid posteriorly, covered with curved lamellae (fig. 1.7). Teeth small and pointed. Eye rudimentary, concealed under the skin; ear-opening absent. No fore limbs; hind limbs absent (♀) or rudimentary (♂). No praeanal pores. The egg has a calcareous shell and is not circular.

A single genus and species, inhabiting the Indo-Australian region.

#### 1. *Dibamus* Dum. & Bibr.

(DUM. & BIBR., *Efp. Gén.* V p. 833, 1839).

Snout covered with three large shields: the rostral and a labial on each side, which may fuse into one single shield. Nostril pierced in the rostral, with a straight horizontal suture behind

it. Limbs absent in females; the hind pair in males are two flap-like rudiments.

Distribution. Nicobars; Archipelago from Sumatra to New Guinea.

A single species.

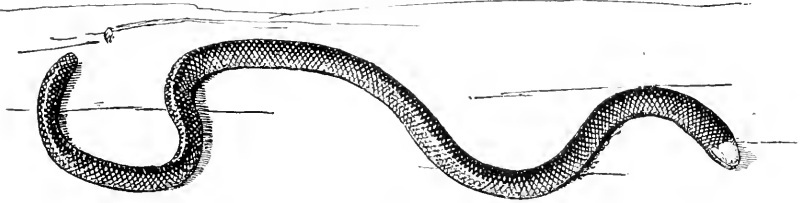


Fig. 99. *Dibamus novae-guineae* D. & B.

### 1. *Dibamus novae-guineae* Dum. & Bibr.

*Dibamus novae-guineae*, Dum. & Bibr., *Erp. Gén.* V 1839, p. 834.

*Dibamus novae-guineae* Boulenger, *Cat. Liz.* III 1887, p. 435.

*Rhinophidium nicobaricus*, Steindachner, *Novara Rept.* 1869, p. 53.

*Dibamus nicobaricus*, Boulenger, *Cat. Liz.* III 1887, p. 435.

Snout conical, obtuse, slightly projecting. Head covered with enlarged shields: a rostral, a pair of labials, a frontal, an interparietal and an ocular on each side; rostral largest, as long as frontal and interparietal together or somewhat shorter. Eye distinguishable through the ocular. One upper and one large lower labial on each side; mental narrow, trapezoid.

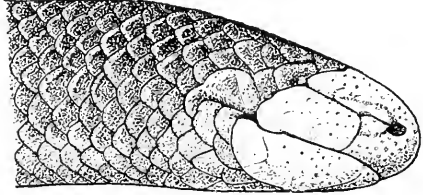


Fig. 100. *Dibamus novae-guineae* D. B.  
Head  $\times 7\frac{1}{2}$ .

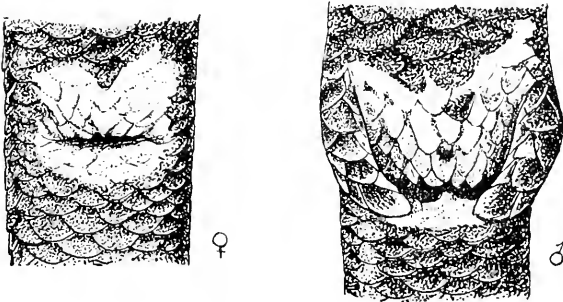


Fig. 101. *Dibamus novae-guineae* D. B.  
Anal region, with rudiments of limbs in the male.  $\times 4\frac{1}{2}$ .

Body vermiform, covered with equal, cycloid, imbricate scales, 22—26 in the middle of the body. Praeanal scales small. Tail very short, obtuse. No rudiments of limbs in females; males with two flap-like rudiments of the hind limbs on the sides of the anal opening.

Uniform purplish-brown above, somewhat lighter beneath. Length of head and body 147 mm.; tail 18 mm.

Habitat: Simalur!; Nias!; Sumatra (Singkarah, Kaju tanam!, Agam<sup>1)</sup>); Bornco (Baram river); Lombok; Celebes (Tomohon, Rurukan, Luhu!, Meraka); Ceram; Ternate; Halmahera; Waigcu; New Guinea!. — Nicobars; Malacca.

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1) See Nelly de Rooij, Reptiles of Nias, in Kleiweg de Zwaan: Die Insel Nias bei Sumatra III 1915, p. 296.



## II. Order CHELONIA.

Quadrated bone united to the skull, not movable. No teeth; a horny sheath covering the jaws. Body enclosed in a bony shell; dorsal ribs single-headed; no sternum. Anal opening round or longitudinal; copulatory organ present, single. Oviparous, the eggs are oblong or round (fig. 102), hard-shelled, in the *Cheloniidae* soft-shelled.

The tortoises and turtles of the Indo-Australian region belong to seven families.

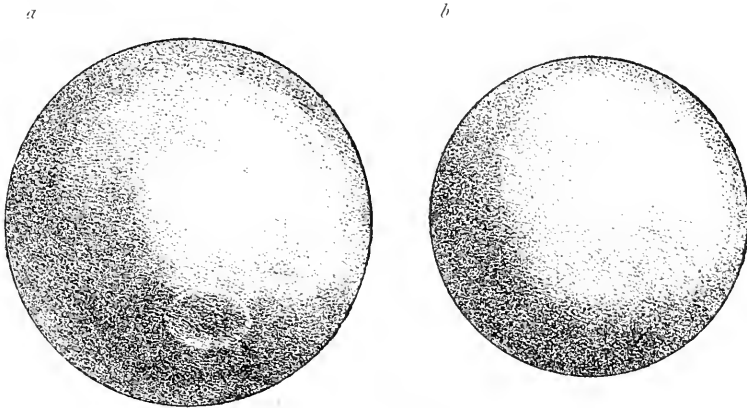


Fig. 102. Eggs of *Chelonia*. Nat. size.  
*a.* of *Chelonia mydas* (L.), *b.* of *Carettochelys insculpta* Ramsay.

### Synopsis of families.

- A. Shell covered with epidermal, horny shields.
- I. Pectoral shields of plastron in contact with the marginals.
    - a.* Plastral shields 11 or 12 . . . . . *Testudinidae* p. 288.
    - b.* Plastral shields 13 . . . . . *Chelyidae* p. 314.
  - II. Pectoral shields widely separated from the marginals.
    1. Tail more than half the length of the shell; plastron small, cruciform . . . . . *Chelydridae* p. 287.
    2. Tail not half so long as the shell; limbs paddle-shaped, one or two claws . . . . . *Cheloniidae* p. 307.

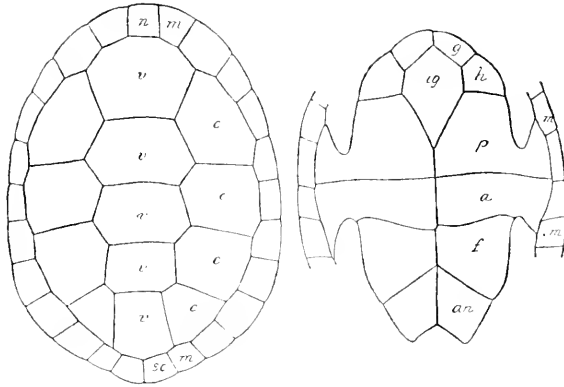


Fig. 103. Shields of carapace and plastron.

*n.* Nuchal. *v.* Vertebral. *c.* Costal. *m.* Marginal. *sc.* Supracaudal.  
*g.* Gular. *ig.* Intergular. *h.* Humeral. *p.* Pectoral. *a.* Abdominal.  
*f.* Femoral. *an.* Anal.

*B.* Shell without epidermal shields.

1. Limbs paddle-shaped, no claws . . . . . *Dermochelyidae* p. 312.
2. Limbs broad and flat, two claws . . . . . *Carettochelyidae* p. 322.
3. Limbs with distinct digits, three claws . . . . . *Trionychidae* p. 325.

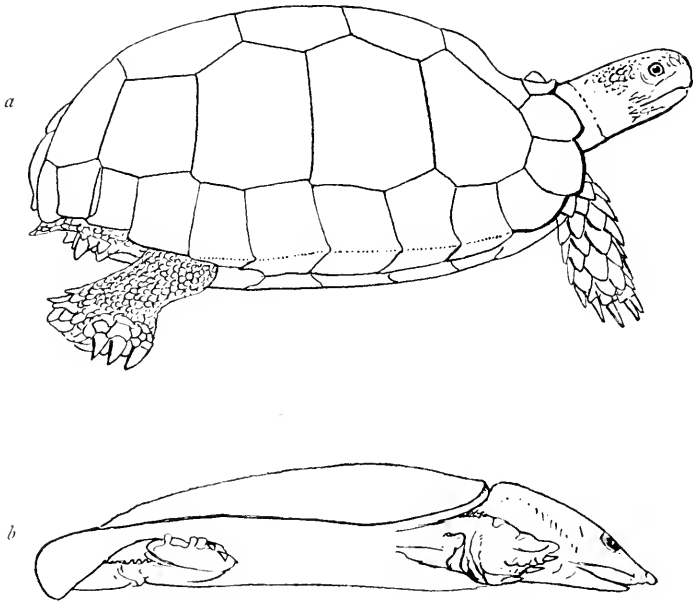


Fig. 104. *a.* A high-shelled form (*Testudo emys* Schleg. & Müll.).  
*b.* A flat form (*Trionyx cartilagineus* (Bodd.)).

## 1. Fam. CHELYDRIDAE.

Shell covered with epidermal shields. Head large, incompletely retractile; neck completely retractile; chin with small dermal appendages. Plastron small, cruciform, articulating with the carapace by gomphosis; inframarginalia present; nine plastral bones. Nuchal plate with long rib-like processes. Tail long. Digits moderate, with four or five claws.

A single genus inhabits the Indo-Australian region.

1. *Devisia* D. Ogilby.

(DOUGLAS OGILBY, Proc. Roy. Soc. Queensland XIX p. 11, 1905).

Head large, depressed, triangular; orbits lateral. No supra-marginal shields. Tail with irregular shields of variable size below.

Distribution. New Guinea.

A single species.

1. *Devisia mythodes* D. Ogilby.

*Devisia mythodes*, Douglas Ogilby, Proc. Roy. Soc. Queensland XIX 1905, p. 11.

*Devisia mythodes*, Siebenrock, SB. Akad. Wiss. Wien Vol. 116 1907, p. 532;

Zoolog. Jahrb. Supplem. X 1909, p. 435.

Carapace ovate, depressed in the median line; its greatest width above the inguinal region, anteriorly feebly emarginated, posteriorly slightly serrated. Nuchal shield crescentic, its anterior border with narrow spiniform processes; vertebrae with a few coarse striae, first tetragonal, the others rounded; first costal shield triangular, second largest; supracaudals angulated posteriorly. Plastron smooth, width of the bridge  $1\frac{1}{4}$  times in length of plastron; gular shields small, triangular, basal width less than length; humerals tetragonal, a deep narrow groove extends outwards and backwards, crossing the humero-pectoral suture; pectorals subtetragonal; abdominals hexagonal; femorals pentagonal; anals triangular; anterior and posterior inframarginalia present. Head large, triangular, depressed, with two pair of parietal ridges, the inner pair converging and uniting in a prominent point on the posterior border of the occiput. Nostrils small and circular, in a depressed vertical plate; two small supranasals; a pair of large praecoculars, meeting at the median line; supraoculars also meeting; a single postocular; frontal strongly rugose, with its point wedged in between the convergent parietal ridges; parietals broken up

into squamiform plates, the largest forming a series along the inner ridge externally; temporals two, the lower lateral and very large, the upper superior and smaller. Diameter of orbit equal to the length of the snout and to the interorbital space; cleft of mouth a little less than half the length of the head; mandibular symphysis longer than diameter of orbit; a pair of small mental barbels. Neck wrinkled and vermiculated, one time and three fifths the length of the head, the anterior half with a few erect tubercles above. Limbs with series of scale-like plates above, outer edge of fore limbs with three large tubercles; claws strong and curved, especially the three inner ones, of which the middle one is largest; outer toe with a horn-like plate at the base. Tail rugose, finely vermiculated, with 7 large dermal serrae above, below with irregular scales. Length of carapace 330 mm., plastron 250 mm. (After D. Ogilby, not seen by me).

Habitat: New Guinea (Fly river).

A very rare species, known by one specimen only.

## 2. Fam. TESTUDINIDAE.

Shell covered with epidermal shields. Head and neck completely retractile; ear distinct. Plastron large; inframarginalia absent; nine plastral bones. Nuchal plate without rib-like processes. Digits short or moderate, with four or five claws.

Terrestrial or aquatic tortoises.

### Key to the Indo-Australian genera.

A. Head covered with undivided skin, or the skin divided posteriorly in small shields. Digits with a distinct or rudimentary web; metacarpels long; claws long and curved.

I. Neural plates hexagonal, the short side in front.

a. Alveolar surface of upper jaw broad, with one or two median ridges.

i. A single median ridge in the upper jaw; choanae between the eyes; fore limbs with five claws.

aa. Suture between gular shields about half as long as that between humerals; symphysis of lower jaw shorter than the diameter of the orbit. . . . . I. *Callagur* p. 289.

- bb.* Suture between gulars slightly longer than that between humerals; symphysis of lower jaw longer than diameter of the orbit . . . 2. *Orlitia* p. 291.
2. Two median ridges in the upper jaw; choanae behind the eyes; fore limbs with four claws. . . 3. *Batagur* p. 294.
- b.* Alveolar surface of upper jaw without median ridges.
1. Choanae behind the eyes . . . . . 4. *Damonia* p. 295.
2. Choanae between the eyes . . . . . 5. *Bellia* p. 296.
- II. Neural plates hexagonal, the short side behind.
- a.* Plastron united by suture to the carapace, not movable; skin of head smooth, not divided. . . . 6. *Geoemyda* p. 298.
- b.* Plastron united by ligament to the carapace, movable in the adult between the hyo- and hypo-plastron.
1. Vertebral shields 5; skin of head undivided. . . 7. *Cyclomyis* p. 301.
2. Vertebral shields 6 or more; skin of posterior part of head divided into small shields. . . . 8. *Notochelys* p. 304.
- B.* Head covered above with horny shields; digits without web; metacarpels short; claws thick and straight . . . 9. *Testudo* p. 305.

### 1. *Callagur* Gray.

(GRAY, Suppl. Cat. Sh. Rept. 1 p. 53, 1870).

Head covered with small irregular scales at the temporal region and the occiput only. Skull with a bony temporal arch; alveolar surfaces broad, of the upper jaw with a median ridge; choanae between the eyes. Neural plates hexagonal, long, short-sided in front; fourth vertebral not longer than third, covering three neuralia. Plastron united to the carapace by suture. Digits entirely webbed; fore limbs with five, hind limbs with four claws. Tail very short.

Distribution. Borneo; Malay Peninsula; Philippines.

A single species.

#### 1. *Callagur borneensis* (Schleg. & Müll.).

*Emys borneensis*, Schlegel & Müller, in Temm. Verh. Nat. Nederl. Ind. 1844, p. 30.

*Clemmys borneensis*, Strauch, Chelon. Stud. 1862, p. 33.

*Batagur borneensis*, Hubrecht, Notes Leyden Mus. III 1881, p. 47.

*Callagur picta*, Boulenger, Cat. Chelon. 1889, p. 60.

*Clemmys borneensis*, Lenz, Mitt. Geogr. Ges. Lübeck (2) V 1893, p. 93.

*Kachuga brookei*, Bartlett, Sarawak Gazette Febr. 1 1895, p. 29.

*Kachuga dhongoka*, part., Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 452.

*Callagur picta*, idem, p. 455.

Carapace with a strong vertebral and an interrupted costal

keel in the young, which disappear in the adult. Nuchal in

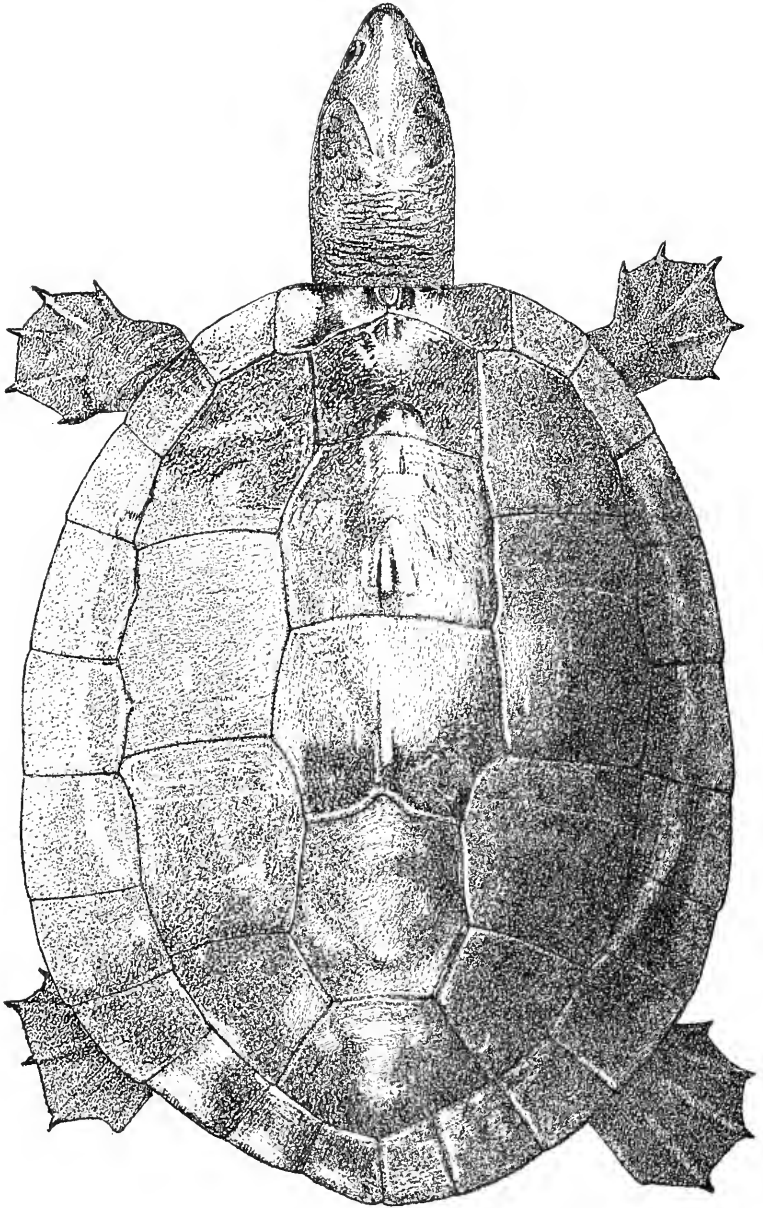


Fig. 105. *Callagur borneensis* (Schleg. & Müll.).

the young small, broader at the base than at the top, very

small or absent in the adult; first vertebral as broad in front as behind, or a little broader; second to fourth vertebrae almost equal in length, more broad than long in the young, about as broad as long in the adult; third vertebral with a concave postero-lateral border. Plastron large, angulated laterally in the young, convex in the adult, truncate anteriorly, notched posteriorly; the width of the bridge exceeds the length of the posterior lobe; suture between the gulars about half as long as that between the humerals; longest median suture between the abdominals; inguinal large, axillary smaller. Head small, covered with smooth skin, and small shields on its posterior part; snout pointed; jaws with denticulated edge, upper jaw feebly notched in the middle; mandibular symphysis a little shorter than the diameter of the orbit. Limbs with transverse enlarged scales; fore limbs with five, hind limbs with four claws; digits entirely webbed.

Brown above, with three broad black longitudinal bands; yellowish below; head sometimes (males only?) with a broad red band from the tip of the snout to the crown; a black supraocular band. Young specimens with one to three black spots on each vertebral and one on the posterior border of each costal, sometimes forming a black band between the centre and the border; some of the marginals also with round black spots, on the suture between two shields. Length of shell 760 mm.

Nom. indig. Beluku (Borneo).

Type-specimen examined in the Leyden Museum.

Habitat: Borneo! (Sarawak, Kuching, Oya, Buntal, Baram river!, Pontianak). — Malacca; Singapore; Penang; Philippines.

A herbivorous species, aquatic.

## 2. *Orlitia* Gray.

(GRAY, Ann. Nat. Hist. (4) XI p. 156, 1873).

Head covered with small shields posteriorly only; skull with a bony temporal arch; alveolar surface of upper jaw broad, with a strong median ridge; choanae between the eyes. Neural plates hexagonal, the short side in front. Plastron united to the carapace by suture. Digits entirely webbed; fore limbs with five, hind limbs with four claws. Tail very short.

Distribution. Borneo; Sumatra.

A single species.

1. *Orlitia borneensis* Gray.

*Orlitia borneensis*, Gray, Ann. Nat. Hist. (4) XI 1873, p. 173.

*Bellia borneensis*, Boulenger, Cat. Chel. 1889, p. 100.

*Hardella baileyi*, Bartlett, Sarawak Gazette May 1 1895, p. 83.

*Brookeia baileyi*, idem, June 1 1896, p. 113.

*Adelochelys crassa*, Baur, Anat. Anz. XII 1896, p. 314, fig. 1-4.

*Liemys inornata*, Boulenger, Ann. Nat. Hist. (6) XIX 1897, p. 469.

*Orlitia borneensis*, Schenkel, Verh. Naturf. Ges. Basel XIII 1901, p. 194.

*Orlitia borneensis*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 458.

Carapace very convex, tectiform, with an obtuse median keel, posterior margin serrated in young specimens; carapace a little depressed, smooth and rounded in adult specimens.

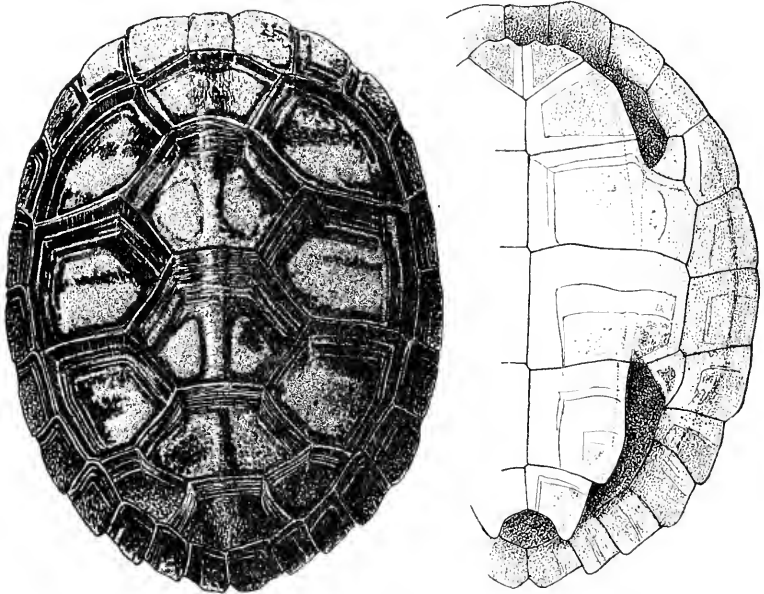


Fig. 106. *Orlitia borneensis* Gray. Young specimen  $\times \frac{5}{7}$ .

Nuchal shield more broad than long, narrow anteriorly; vertebrals more broad than long, narrower than the costals; fifth vertebral much narrower than others; fourth costal much smaller than third; posterior marginals smaller than the others; dorsal shields a little rugose. Plastron smaller than the opening of the shell, truncate anteriorly, deeply notched posteriorly, angulated laterally in the young; width of bridge exceeds the length of the hind lobe; suture between the anal shields shortest, that between humerals and gulars about equal, length



of pectoral and femoral sutures about equal, shorter than that between the abdominals; axillary and inguinal shields present. Head short and broad, covered with smooth skin and small shields on its posterior part only; snout a little shorter than the diameter of the orbit; upper jaw notched in the middle; alveolar surface with a strong denticulated ridge; mandibular symphysis a little more than the diameter of the orbit. Fore limbs with five, hind limbs with four claws; digits webbed to the claws; fore limb with large transverse shields at the outer side only (fig. 107*b*). Tail short.

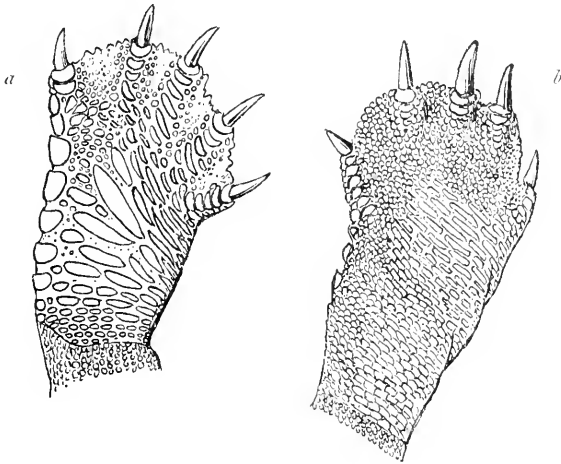


Fig. 107. Left fore limbs of young specimens.

*a.* *Bellia crassicollis* (Gray),

*b.* *Orlitia borneensis* Gray  $\times 2$ .

Blackish-brown above; yellowish below. Young specimens with dark spots along the margin of the plastron. Length of shell 760 mm.

Habitat: Sumatra (Medan in Deli!, Lower Langkat, Djapura and Kotta on Indragiri river, Gunung Sahilan!); Borneo (Sintang, Tampo langit, Batang Lupar river (type of *Hardella baileyi*), Simanggang, Lobuk Antu district! (types of *Liemys inornata*), Kapuas river, Kapuas lake, Majang). — Malay Peninsula; Penang.

Freshwater-tortoise. The eggs are oblong, measuring 79 by 41 mm.

3. **Batagur** Gray.

(GRAY, Cat. Shield Rept. I p. 35, 1855).

Head covered with small scales on its posterior part only. Skull with a bony temporal arch; edge of jaws denticulated; alveolar surfaces very broad, of the upper jaw with two strong denticulated median ridges; edge of jaws denticulated; choanae behind the eyes. Neural plates long, hexagonal, short-sided in front; fourth vertebral not longer than third, covering three neuralia. Plastron united to the carapace by suture. Digits very broadly webbed, with four claws. Tail very short.

Distribution. Bengal; Burma; Malay Peninsula; Siam; Cochin China; Sumatra.

A single species.

1. **Batagur baska** (Gray).

*Emys baska*, Gray, Syn. Rept. 1831, p. 24.

*Batagur baska*, Boulenger, Cat. Chel. 1889, p. 61 (s. syn.).

*Batagur baska*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 456.

Carapace a little depressed, smooth, with a vertebral keel in the young; nuchal shield more broad than long; second to fourth vertebrae almost equal, about as broad as the costals; postero-lateral border of third vertebral concave. Plastron large, convex, truncate anteriorly, notched posteriorly, angulate laterally in the young; width of bridge exceeds the length of the posterior lobe; suture between the gulars not more than half that between the humerals; longest median suture between the abdominals; inguinal shield large, axillary smaller. Head small, covered with smooth skin and small scales on its posterior part; snout pointed, long, produced upwards; edge of jaws denticulated; upper jaw notched in the middle; mandibular symphysis almost equals the diameter of the orbit. Limbs with four claws and large, transverse scales; digits entirely webbed. Tail very short.

Olive-brown above; yellowish beneath. Length of shell 560 mm. (Not seen by me).

Habitat: Sumatra (Tjinako river, Indragiri river near Djapura, Fort de Kock). — Malay Peninsula; Penang; Burma; Bengal; Siam; Cochin China.

Freshwater-tortoise, laying its eggs on sandy banks; omnivorous.

4. *Damonia* Gray.

(GRAY. Proc. Zool. Soc. London p. 193, 1869).

Head covered with small shields on its posterior part only. Skull with a bony temporal arch; alveolar surface broad, no median ridge; choanae behind the eye. Neural plates hexagonal, short-sided anteriorly. Plastron united to the carapace by suture. Digits entirely webbed, with five claws on the fore limb, four on the hind limb. Tail short.

Distribution. India; China; Japan; Malacca; Java.

A single species.

1. *Damonia subtrijuga* (Schleg. & Müll.).

*Emys subtrijuga*, Schlegel & Müller, in Temminck, Verh. Naturk. Ned. Ind. 1844, p. 30.

*Damonia subtrijuga*, Boulenger, Cat. Chel. 1889, p. 94 (s. syn.).

*Geoclemys subtrijuga*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 476.

*Geoclemys subtrijuga*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 142.

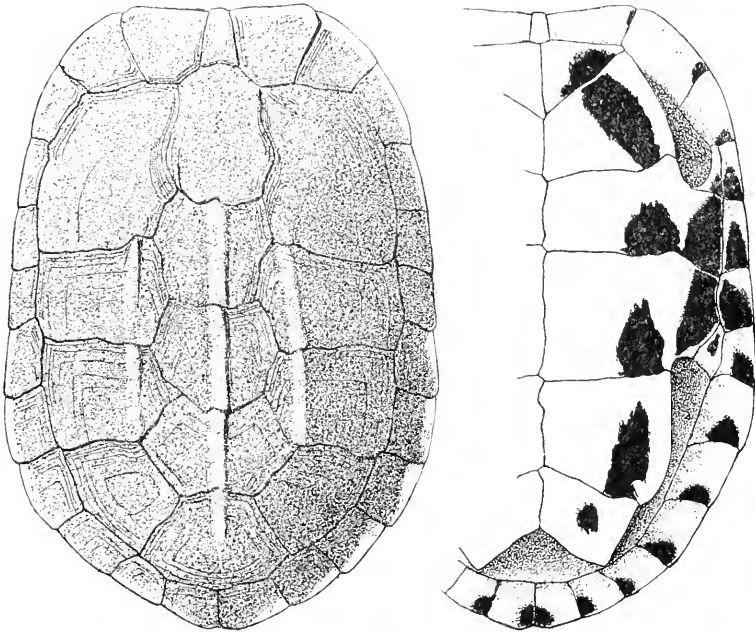


Fig. 108. *Damonia subtrijuga* (Schleg. & Müll.).

Carapace depressed, with three keels, the lateral keels not reaching the fourth costal shield; posterior margin not serrated;

nuchal broad behind; second to fourth vertebrae a little more broad than long, narrower than the costals. Plastron smaller than the opening of the shell, flat in both sexes, truncate anteriorly, angularly notched posteriorly, angulate laterally; width of bridge almost equals length of hind lobe; longest median suture between the abdominals; suture between the gulars about as long as that between the humerals; axillary and inguinal shields present. Head large, covered with smooth skin and small shields posteriorly; snout projecting; upper jaw emarginate in the middle; mandibular symphysis broader than the diameter of the orbit. Digits entirely webbed, fore limb with five claws, hind limb with four. Tail very short.

Carapace brown with an indistinct black spot on each shield; plastron yellow, a large black blotch on each shield; soft parts dark brown; a yellow band from the tip of the snout along the canthus rostralis and the supraorbital edge to the temple, another on the lores to the angle of the mouth; two or four vertical streaks below the nostrils; a V- or Y-shaped marking on each side of the mandible; neck streaked with yellow; limbs marked with yellow. Length of shell 200 mm.

Habitat: Java! (Depok, Bantam, Duri, Batavia). — Malay Peninsula; Cambodja; Siam; Cochin China.

Aquatic tortoise; carnivorous.

## 5. *Bellia* Gray.

(GRAY, Proc. Zool. Soc. London p. 197, 1869).

Head covered with small shields posteriorly only. Skull with a bony temporal arch; alveolar surfaces moderately broad, no median ridge; choanae between the eyes. Neural plates hexagonal, short-sided in front. Plastron united to the carapace by suture. Digits entirely webbed, with five claws on the fore limbs, four on the hind limbs. Tail very short.

Distribution. Burma; Siam; Malacca; Philippines; Sumatra; Borneo; Java.

A single species.

### 1. *Bellia crassicollis* (Gray).

*Emys crassicollis*, Gray, Syn. Rept. 1831, p. 21.

*Bellia crassicollis*, Boulenger, Cat. Chel. 1889, p. 98 (s. syn.).

*Bellia crassicollis*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 478.

*Orlitia crassicollis*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 142.

Carapace a little depressed, with three keels, the laterals disappearing in the adult; vertebral region flattened in the adult male; posterior margin serrated; nuchal small, broad behind; hind border of first vertebral narrow, not half the length of that shield; second to fourth vertebrae as long as broad, much narrower than the costals; the postero-lateral sides longest and concave. Plastron smaller than the opening of the shell, truncate anteriorly, angularly notched posteriorly, angulate laterally, feebly concave in the males; width of bridge

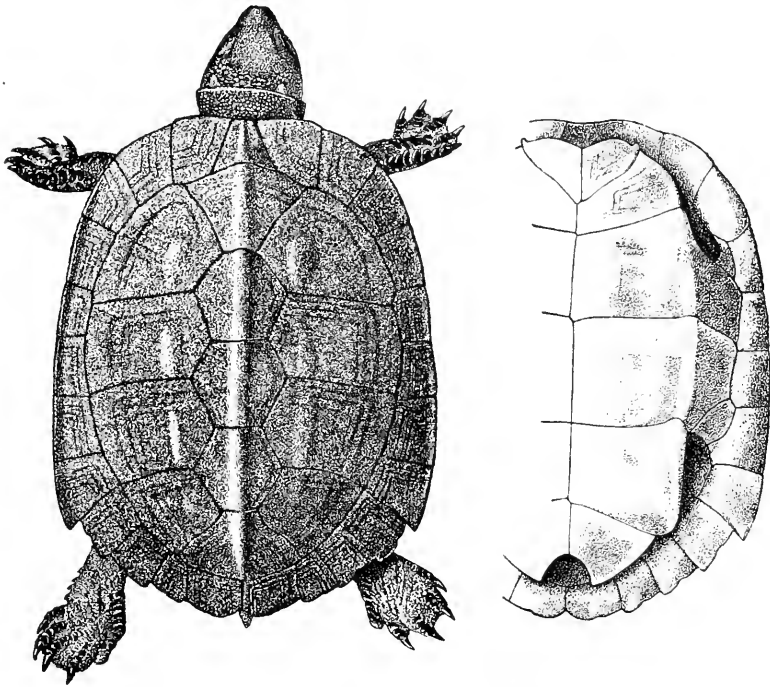


Fig. 109. *Bellia crassicollis* (Gray). Young specimen  $\times \frac{2}{3}$ .

equals the length of the hind lobe; longest suture usually between the abdominals; shortest between the humerals, which is about half that between the gulars; axillary and inguinal shields present. Head large, covered with smooth skin and small shields behind; snout short; mandibular symphysis a little shorter than the diameter of the orbit. Fore limb and outer side of leg with large transverse scales (fig. 107 *a*); digits entirely webbed, fore limb with five, hind limb with four claws.

Carapace dark brown or black; plastron usually variegated

with yellow or with yellow bands along the sutures, or with a broad band on each side; soft parts dark brown or black, with some large yellow spots on the head, disappearing in the adult. Length of shell 200 mm.

**Habitat:** Sumatra (Medan!, Deli!, Sukaranda in Langkat, Indragiri, Djambi!, Palembang!, Fort de Kock); Borneo!; Java (Depok, Duri). — Malay Peninsula; Penang; Siam; Cambodja; Tenasserim; Philippines.

Freshwater-tortoise, living in streams and ponds; carnivorous.

## 6. *Geoemyda* Gray.

*Geoemyda*, Gray, Proc. Zool. Soc. London 1834, p. 100.

*Geoemyda*, Boulenger, Cat. Chel. 1889, p. 135.

*Nicoria*, Gray, Cat. Sh. Rept. I 1855, p. 17.

*Nicoria*, Boulenger, Cat. Chel. 1889, p. 118.

*Heosemys*, Stejneger, Proc. Biol. Soc. Wash. XV 1902, p. 258.

*Heosemys*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 506.

*Geoemyda*, Annandale, Rec. Ind. Mus. Vol. IX Part II 1913, p. 64.

Head covered with smooth skin, undivided. Alveolar surfaces narrow, without median ridge; choanae between the eyes. Neural plates hexagonal, short-sided behind or alternately tetragonal and octagonal. Plastron united to the carapace by suture. Digits with or without a short web; five claws on the fore limb, four on the hind limb. Tail very short.

**Distribution.** Burma; Malacca; Indo-Australian Archipelago; C. and S. America.

### Key to the Indo-Australian species.

- A. Carapace tricarinate; no axillary and inguinal shields;  
     bony temporal arch present. . . . . 1. *G. spengleri* p. 298.  
 B. Carapace unicarinate; axillary and inguinal shields  
     present; no bony temporal arch . . . . . 2. *G. spinosa* p. 300.

#### 1. *Geoemyda spengleri* (Gmel.).

*Testudo spengleri*, Gmelin, Syst. Nat. I 1789, p. 1043.

*Nicoria spengleri*, Boulenger, Cat. Chel. 1889, p. 120 (s. syn.).

*Geoemyda spengleri*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 495.

Carapace depressed, with three strong keels; anterior margin serrated, posterior margin strongly serrated, each marginal ending in a point. Nuchal trapezoid, broadest behind, emarginate posteriorly; vertebrae more broad than long, about as

broad as the costals. Plastron large, emarginate anteriorly, broadly notched behind; width of bridge equals length of hind lobe; abdominals largest, the others take the following order: femorals, pectorals, humerals, anals; gulars smallest; no axillary or inguinal shields. Head covered with undivided skin; upper jaw strongly hooked in the middle; mandibular symphysis shorter than the diameter of the orbit. Limbs covered with uniform, imbricate scales, digits shortly webbed, with five claws at the fore limb, four at the hind limb. Tail a little longer than the head.

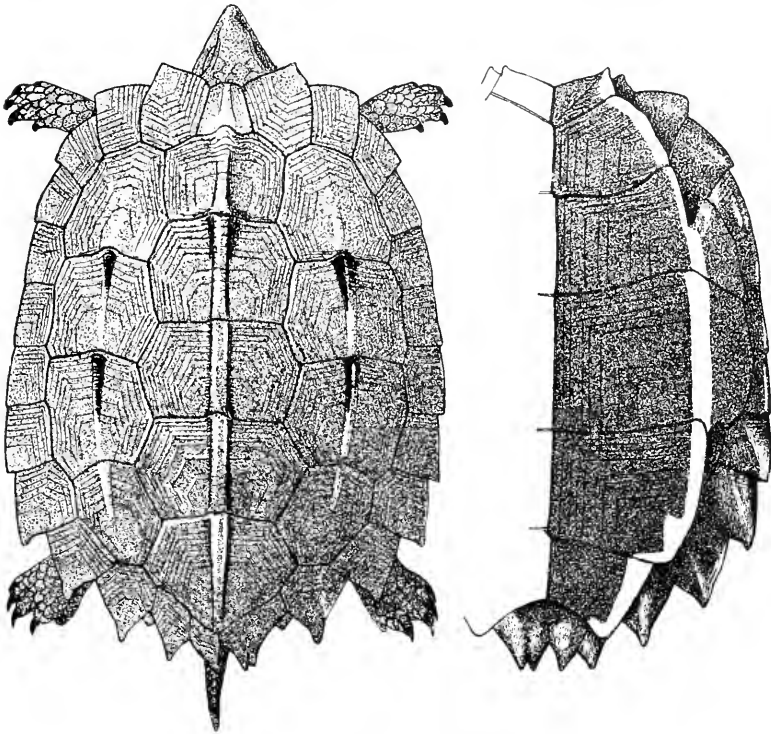


Fig. 110. *Geomyda spengleri* (Gmel.).

Carapace yellowish-brown, speckled with brown; dorsal keels with black lines; plastron dark brown, bordered with a yellow band, which separates the bridge from the other part of the plastron; head pale brown; a yellowish longitudinal streak beginning at the eye, a short one behind the eye and a third above the tympanum; limbs with small yellow spots. Length of shell 104 mm.

Habitat: Batu Islands; Sumatra (Serdang in Deli); Borneo.—  
Philippines; S. China; Loo Choo Islands; Annam.  
Semiaquatic.

2. *Geoemyda spinosa* (Gray).

*Emys spinosa*, Gray, Syn. Rept. 1831, p. 20.

*Geoemyda spinosa*, Boulenger, Cat. Chel. 1889, p. 137 (s. syn.).

*Heosemys spinosa*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 506.

Carapace much depressed, with a broad flat vertebral region and an obtuse keel; margin serrated anteriorly and posteriorly; young specimens with a short keel or spinose tubercle on each costal shield, each marginal ending in a spine, with or without small denticulations, and a strong vertebral keel. Nuchal shield more long than broad; second to fourth vertebrae much

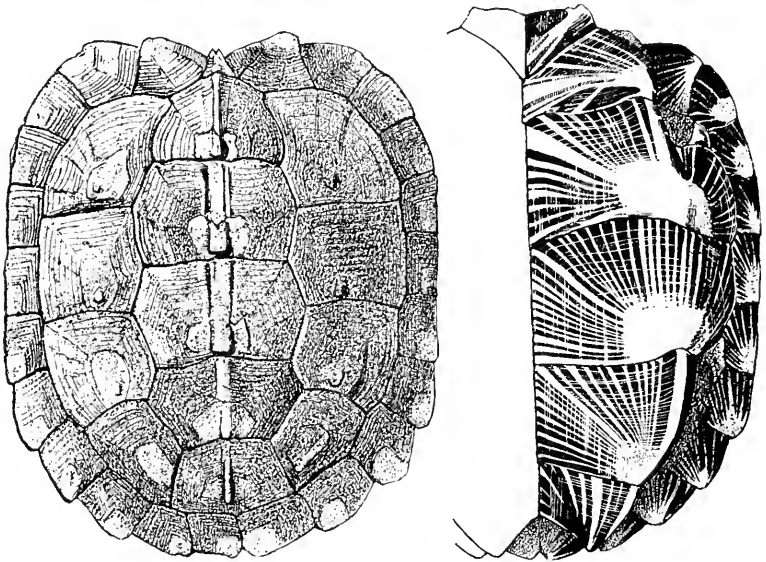


Fig. 111. *Geoemyda spinosa* (Gray).

more broad than long, at least as broad as the costals. Plastron large, truncate anteriorly, angularly notched behind; width of bridge almost equals the length of the hind lobe; suture between the abdominals and that between the pectorals about equal; axillary and inguinal shields present. Head covered with undivided skin; upper jaw emarginate in the middle, bicuspid. Fore limb with five claws, hind limb with four, digits shortly webbed. Tail very short.



Carapace reddish or brown, the vertebral keel lighter; plastron with yellow and brown radiating streaks on each shield; soft parts brown; a yellow spot on each side of the neck near the ear; head and limbs scarlet-spotted in life. Length of shell 220 mm.

Nom. indig. Kura Kura (Borneo).

Habitat: Batu Islands!; Sumatra! (Pasei, Deli!, Bindjey in Lower Langkat, Tandjong Batu Bara, Padang Bedagei, Raja Mts., Sukaranda in Indragiri, Padang Highlands); Banka!; Gr. Natuna Island; Borneo! (Kuching, Marudy on Baram river, Lihang Bahaya, Muara Teweh, Pontianak, Kapuas river, Putus Sibau!, Sambas!, Samangaris, Lawes Mts.). — Singapore; Penang; Malay Peninsula; Tenasserim; Burma.

Freshwater-tortoise, living in jungle streams up to 3000 feet or terrestrial.

#### 1. *Cyclemys* Bell.

(BELL, Proc. Zool. Soc. London p. 117, 1834).

Head covered with smooth skin, undivided. Skull with a bony temporal arch; postorbital arch broad; alveolar surfaces without median ridge; choanae between the eyes. Neural plates hexagonal, short-sided behind; five vertebral shields present. Plastron united to the carapace by ligament, movable between the hyo- and hypoplastron. Digits with a short web; fore limb with five, hind limb with four sharp claws. Tail short.

Distribution. The East-Indies; S. China.

#### Key to the Indo-Australian species.

- A. Carapace serrated posteriorly, unicarinate in the young; plastron notched behind, bridge distinct. . 1. *C. dhor* p. 301.  
 B. Carapace not serrated, tricarinate in the young; plastron not notched behind, no distinct bridge. . 2. *C. amboinensis* p. 302.

#### 1. *Cyclemys dhor* (Gray).

*Emys dhor*, part., Gray, Syn. Rept. 1831, p. 20.

*Cyclemys dhor*, Boulenger, Cat. Chel. 1889, p. 131 (s. syn.).

*Cyclemys dhor*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 501.

Carapace depressed, with an obtuse keel; posterior margin serrated; 5 vertebrals as broad as long or a little more broad, narrower than the costals. Plastron narrower than the opening of the shell, angularly notched behind; bridge distinct, its

width is contained two times and three fourths to three times in the length of the plastron; a transverse hinge between the hyo- and hypoplastron in the adult, not corresponding with the suture between the pectoral and abdominal shields; longest median suture between the pectorals; suture between the pectoral and marginals shorter than that between the abdominal and marginals; axillary and inguinal shields small or absent. Head covered with undivided skin; hook of upper jaw bicuspid. Fore limb with broad transverse scales anteriorly; digits webbed, with sharp claws, five on the fore limb, four on the hind limb. Tail short.

Carapace brown or yellowish-brown, spotted with dark brown or with radiating dark lines on the shields; plastron dark brown, in the young yellowish or pale brown with dark brown spots or radiating lines; neck with dark and light longitudinal lines. Length of shell 220 mm.

Nom. indig. Kura Kura (Borneo).

Habitat: Nias!; Mentawai Islands (Sipora); Sumatra! (Bindjei and Sukaranda in Langkat, Indragiri, Bangko river near Muara Labu, Fort de Kock, Padang!); Banka; Gr. Natuna Island; Borneo! (Sebruang Valley, Kapuas river, Kuching in Sarawak, Merabah); Java!. — Malay Peninsula; Tenasserim; Burma; N. India; Siam; Cambodja; Annam.

Semiaquatic.

## 2. *Cyclemys amboinensis* (Daud.).

*Testudo amboinensis*, Daudin, Rept. II 1802, p. 309.

*Cyclemys amboinensis*, Boulenger, Cat. Chel. 1889, p. 133 (s. syn.).

*Cyclemys amboinensis*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 503.

Carapace very convex, with or without a vertebral keel in adult females, tricarinate and depressed in the young (fig. 113); 5 vertebrals as long as broad or a little more long, much narrower than the costals; in the young broader. Plastron nearly as large as the opening of the shell, truncate posteriorly, without distinct bridge; pectoral shields as long as abdominals or shorter, as long as humerals or a little longer; axillary and inguinal shields small or absent. Head small, covered with undivided skin; upper jaw not emarginated, scarcely hooked. Fore limb with broad transverse scales anteriorly; digits webbed, with sharp claws, five on the fore limbs, four on the hind limbs. Tail short.

Carapace brown or black; plastron yellow with large black

spots or dark brown with yellow sutures. Young specimens

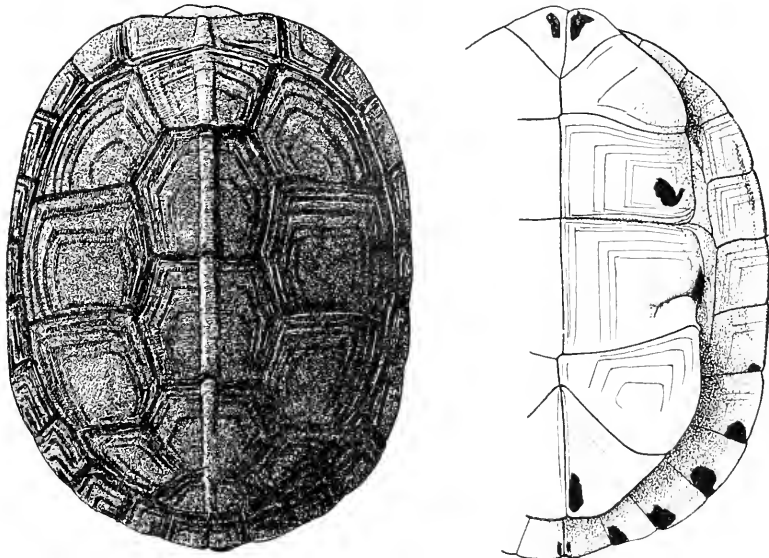


Fig. 112. *Cyclemys amboinensis* (Daud.).

have a broad black band on the plastron, which is bordered with yellow. Head and neck brown above, yellow below, with a yellow band on each side, meeting above the nostrils; another yellow band passing through the eye, bordered below by a dark brown band; ear yellow; lips yellow; a dark brown band from the corner of the mouth to below the ear; each digit with a median yellow streak. Length of shell 250 mm.

Nom. indig. Kura Kura (Borneo), Baning.

Habitat: Simalur!; Nias!; Engano; Sumatra (Deli!, Bindjei in Langkat, Padang Bedagei, Indragiri, Gunung Sahilan!); Banka; Gr. Natuna Island; Borneo! (Kuching, Baram river, Kidi district, Pontianak); Java! (Batavia!, Buitenzorg, Duri, Depok); Celebes! (Manado, Soroako on Lake Matana!, Pandjana!, Kema, Macassar!, Rumbi Mengkoka); Buru; Ambon!; Ceram!; Batjan;

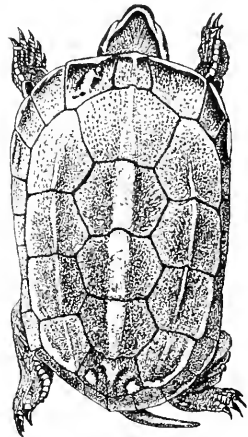


Fig. 113.  
*Cyclemys amboinensis*  
(Daud.). Nat. size.  
New-born specimen.

Halmahera. — Malay Peninsula; Singapore; Penang; Burma; Siam; Cochin China; Philippines.

Semiaquatic.

### 8. *Notochelys* Gray.

(GRAY, Proc. Zool. Soc. London p. 177, 1863).

Head covered with small shields on the hind part only. Skull with a bony temporal arch; postorbital arch broad; alveolar surfaces without median ridge; choanae between the eyes. Neural plates hexagonal, short-sided posteriorly; six or more vertebral shields. Plastron united to the carapace by ligament movable between the hyo- and hypoplastron. Digits broadly webbed; fore limb with five, hind limb with four sharp claws. Tail short.

Distribution. Malay Peninsula; Sumatra; Borneo; Philippines.

A single species.

#### 1. *Notochelys platynota* (Gray).

*Emys platynota*, Gray, Proc. Zool. Soc. London 1834, p. 54.

*Cyclemys platynota*, Boulenger, Cat. Chel. 1889, p. 130 (s. syn.).

*Notochelys platynota*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 504.

Carapace depressed, angular, with an obtuse, interrupted keel, flat on the vertebral region; posterior margin serrated; six or seven vertebral shields, which are much more broad than long (except the first), as broad as the costals. Plastron narrower than the opening of the shell, openly emarginate behind; bridge distinct, its width is contained two times and a half to two times and two thirds in the length of the plastron; no distinct transverse hinge; suture between the pectoral and the marginals longer than that between the abdominal and the marginals; pectoral suture as long as or a little shorter

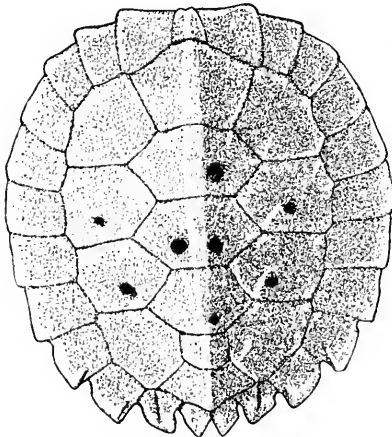


Fig. 114. *Notochelys platynota* (Gray).

Young specimen,  $\times \frac{5}{6}$ .

than abdominal suture; inguinal shield large. Head covered with smooth skin and small shields on its posterior part; upper

jaw hooked, bicuspid. Fore limb with broad band-like shields anteriorly; digits webbed, claws long, curved, five on the fore limb, four on the hind limb. Tail short.

Carapace reddish-brown or yellowish-brown with radiating brown lines. Young specimens with one or two round black spots on each vertebral and costal shield. Plastron yellow, brown-spotted or brown with yellow sutures; head yellowish-brown; neck brown with yellow streaks, one beginning at the posterior corner of the eye. Length of shell 360 mm.

No m. indig. Beijogo (Borneo).

Habitat: Sumatra (Deli, Sukaranda in Langkat, Indragiri, Taluk!); Banka; Java! (Tengger Mts. 1200 M.); Borneo! (Sebruang Valley, Limbang, Brooketon, Kuching, Baram in Sarawak, Bongon). — Malay Peninsula; Singapore; Tenasserim; Cochin China; Philippines.

Likes shallow water; herbivorous.

### 9. *Testudo* L.

(LINNÉ, Syst. Nat. I p. 350, 1766).

Head covered above with small horny shields. Skull with weak or moderately broad temporal and postorbital arches; alveolar surface of upper jaw with one or two median ridges; choanae between the eyes. Neural plates usually alternately tetragonal and octagonal; costal plates alternately narrower and wider; supracaudal usually single. Plastron united to the carapace by suture, front lobe not movable, hind lobe sometimes movable. Limbs club-shaped, covered with large scales or tubercles. Tail short.

Distribution. S. Europe; S. Asia; Africa; America.

Terrestrial and herbivorous.

### Key to the Indo-Australian species.

- A.* Nuchal present; supracaudals two; pectoral shields usually widely separated; heel with conical bony tubercles . . . . . 1. *T. emys* p. 305.  
*B.* Nuchal absent; supracaudal single; anal shields separated; tail with a large horny scale at the end . . . . . 2. *T. forsteni* p. 307.

### 1. *Testudo emys* Schleg. & Müll.

*Testudo emys*, Schlegel & Müller, in Temminck, Verh. Nat. Nederl. Ind. 1840, p. 34, pl. IV.

*Testudo emys*, Boulenger, Cat. Chel. 1889, p. 158 (s. syn.).

*Testudo emys*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 519.

Carapace depressed, not quite half so deep as long; anterior and posterior margins reverted and serrated; nuchal present, a little more broad than long; supracaudals two; vertebrals at least as broad as the costals, much more broad than long; anterior lateral side of second and third not or slightly shorter than posterior lateral; dorsal shields concentrically striated. Plastron large, anterior lobe slightly notched and somewhat

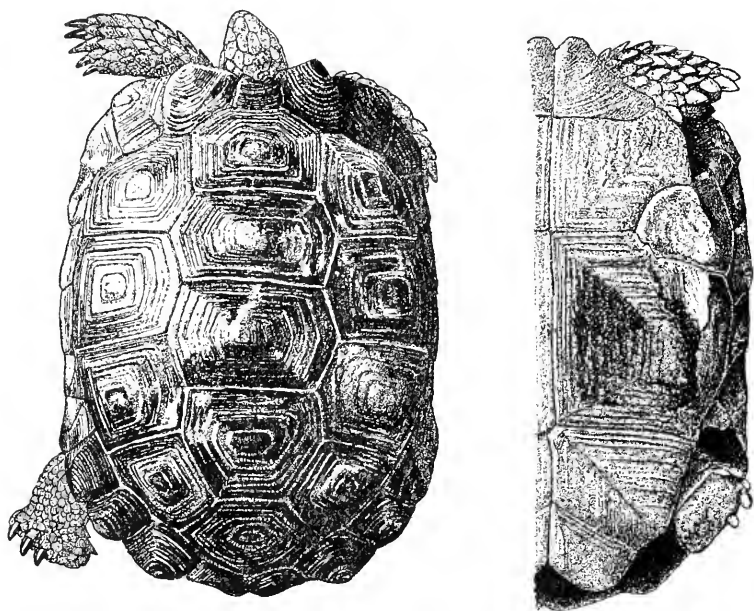


Fig. 115. *Testudo emys* Schleg. & Müll.

produced; hind lobe deeply notched; pectorals usually widely separated from each other; axillary shield very small, inguinal large. Head moderate, two large praefrontals; frontal large; jaws not hooked, with a feebly denticulated edge; alveolar surface of upper jaw with a strong median ridge; temporal arch broad. Fore limb with large, imbricate, bony tubercles anteriorly, five claws; hind limbs with large bony tubercles on the sole, larger spur-like tubercles on the heel and the thigh; four claws. Tail short.

Dark brown or blackish. Young specimens with a yellowish-

brown carapace, with dark brown markings. Length of shell 540 mm.

Nom. indig. Baning (Borneo).

Type-specimens examined in the Leyden Museum.

Habitat: Sumatra! (Pulo Telang and Sukaranda in Langkat, Kotta Sani near Solok!, Singalang 1600—1800 feet!, Padang!, Padang Highlands, Tarat); Borneo (Simanggang, Batang Lupar, Akar river!, Baram river, Mt. Dulit, Sambas!, Madi-plateau!); Java? <sup>1)</sup>. — Malay Peninsula; Penang; Burma; Siam; Assam; S. China.

Lives in dry parts of the woods.

## 2. *Testudo forsteni* Schleg. & Müll.

*Testudo forstenii*, Schlegel & Müller, in Temminck, Verh. Nat. Nederl. Ind. 1844, p. 30.

*Testudo forstenii*, Boulenger, Cat. Chel. 1889, p. 174.

*Testudo forstenii*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 539.

Carapace somewhat depressed, with a flat vertebral region, more than twice as long as high; posterior margin with rounded lobes; nuchal absent; vertebrales much more broad than long, about as broad as the costals; supracaudal single; dorsal shields with concentric lines. Plastron large, deeply notched posteriorly; suture between the pectorals half that between the humerals; anals separated by the anal notch; axillary and inguinal shields moderate. Head moderate; praefrontals large, frontal almost as large; upper jaw feebly hooked, tricuspid. Fore limbs covered anteriorly with unequal, imbricate scales, the outmost largest, five claws; hind limbs with four claws. Tail short, with a large horny scale at the end.

Brown above and below, with a few black spots; on the abdominal shields a large black blotch. Length of shell 170 mm.

Type-specimen examined in the Leyden Museum.

Habitat: Celebes! (Mt. Boliohuto near Sulamatta, Buol); Halmahera!.

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## 3. Fam. CHELONIIDAE.

Shell covered with epidermal shields. Neck incompletely retractile; ear hidden. Plastron large; inframarginalia present;

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<sup>1)</sup> See Notes Leyden Mus. XVII 1895/96 p. 197, where Dr. van Lidth de Jeude discusses the synonymy of this species.

nine plastral bones. Nuchal plate without rib-like processes. Limbs paddle-shaped, with one or two claws.

Marine. The eggs are soft-shelled, round (fig. 102a), and are laid in the sand.

### Key to the Indo-Australian genera.

- A. Four pair of costal shields . . . . . 1. *Chelonia* p. 308.  
 B. Five or more pair of costal shields. . . . . 2. *Caretta* p. 310.

#### 1. *Chelonia* Brogn.

(BROGNART, Bull. Soc. Philom. III p. 89, 1800).

Head with symmetrical shields. Carapace with fontanelles between the costal and the marginal plates; nuchal shield trapezoid; four pair of costal shields. Intergular and a series of inframarginal shields present. Limbs paddle-shaped, with one or two claws.

Distribution. Tropical and subtropical seas.

### Key to the Indo-Australian species.

- A. Dorsal shields juxtaposed; one pair of praefrontals;  
 usually one claw; carapace unicarinate in the young. 1. *C. mydas* p. 308.  
 B. Dorsal shields imbricate; two pair of praefrontals;  
 two claws; carapace tricarinate in the young. . . . . 2. *C. imbricata* p. 309.

#### 1. *Chelonia mydas* (L.).

*Testudo mydas*, Linné, Syst. Nat. I 1766, p. 350.

*Chelone mydas*, Boulenger, Cat. Chel. 1889, p. 180 (s. syn.).

*Chelonia mydas*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 545 (s. syn.).

Carapace tectiform or arched; with a median keel, and sometimes a slight indication of a lateral keel in the young; margin composed of 25 shields, not or indistinctly serrated; dorsal shields juxtaposed; nuchal shield sometimes divided into two; four pair of costals. Plastron rounded anteriorly; intergular shield present; a series of large inframarginals. Snout very short; jaws not hooked; horny sheath of upper jaw striated interiorly and with a denticulated edge, of lower jaw with strongly denticulated edge; alveolar surface of upper jaw with two strong ridges, denticulated; mandibular symphysis short; one pair of praefrontals. Tail short. Limbs flat, with one claw; fore limbs long; young ones sometimes with a second claw.



Carapace olive or brown, marbled with yellow. Of young specimens the limbs are margined with yellow; inferiorly yellow with a dark brown spot on hand and foot. Length of shell 1100 mm.

Nom. indig. Piñu (Borneo).

Habitat: Sumatra (Mouth of the Si Paré Paré river in Batu Bahra); Biliton; Java sea! (Batavia); Madura; Flores!;

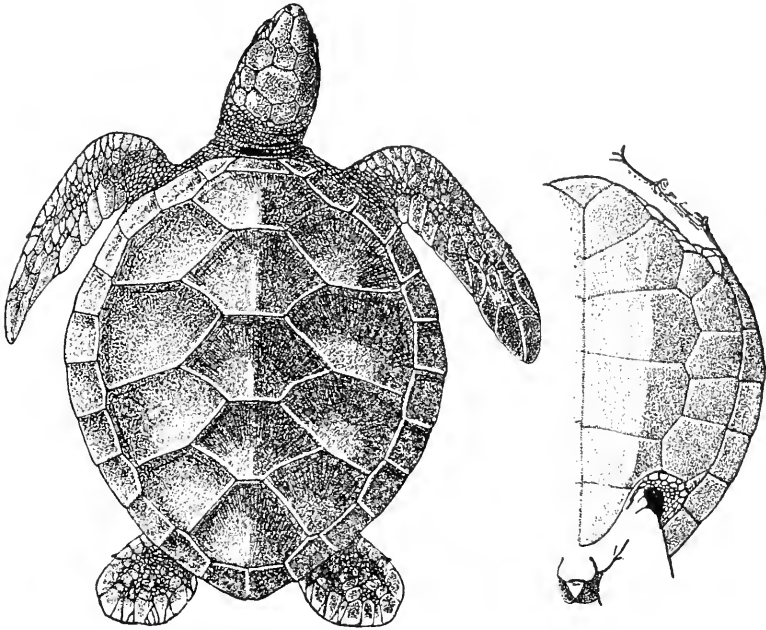


Fig. 116. *Chelonia mydas* (L.).

Bornean seas (Sandakan); Celebes (Gorontalo, Manado, Kandari, Macassar!); Obi!; Ambon!; Banda!; Aru Islands; New Guinea (Humboldt Bay!). — Torres Straits; N. Australia; Formosa; Malay Peninsula; West Indies; Brazil; African coast; Atlantic Ocean.

The Green Turtle is rather common in the Indian Ocean and much fished for, because its flesh is edible. It is herbivorous.

## 2. *Chelonia imbricata* (L.).

*Testudo imbricata*, Linné, Syst. Nat. I 1766, p. 350.

*Chelone imbricata*, Boulenger, Cat. Chel. 1889, p. 183 (s. syn.).

*Chelonia imbricata*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 547 (s. syn.).

Dorsal shields smooth, strongly imbricate, in old specimens juxtaposed; in young ones with three keels, the vertebrals

rhomboidal; margin composed of 25 shields, serrated posteriorly; four pair of costals. Plastron with a series of inframarginals. Snout compressed in the adult; jaws hooked, not or slightly denticulated on the margin; mandibular symphysis long; two pair of praefrontals. Tail short. Limbs flat, with two claws; fore limbs long.

Carapace dark brown, marbled with yellow; plastron yellow; shields of head and limbs bordered with yellow. Young specimens light brown above, dark below. Length of shell 850 mm.

Habitat: Sumatra (Wampu river in Lower Langkat); Gr. Natuna Island; Borneo! (Pontianak); Java; Madura Strait; Flores!; Sumba!; Celebes (Manado!, Macassar!); Ternate; Ambon; Banda sea; Aru Islands; Kei Islands; New Guinea (Sorong, Dorei, Geelvink Bay). — Samoa; Formosa; Malay Peninsula; Arabia; Atlantic Ocean; Guiana; Tehuantepec; Guatamala; Bahamas.

Caught for the epidermal horny shields: tortoise-shell. Carnivorous.

## 2. *Caretta Rafin.*

(RAFINESQUE, Specchio. Sc. (Palermo) II N<sup>o</sup>. 9 p. 66, 1814).

Head with symmetrical shields. Carapace ossified in the adult;

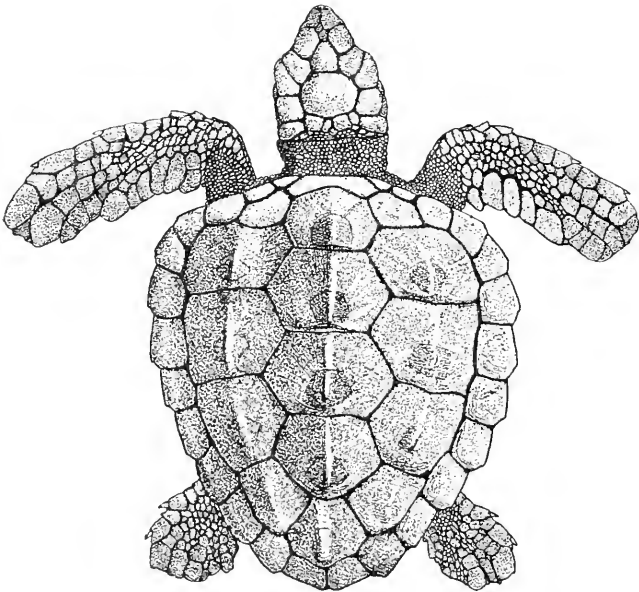


Fig. 117. *Caretta caretta* (L.). Young specimen with three dorsal keels.

nuchal shield six-sided; five or more pair of costal shields. Intergular very small or absent; a series of inframarginal shields. Limbs paddle-shaped, with one or two claws.

Distribution. Tropical and subtropical seas.

A single species.

### 1. *Caretta caretta* (L.).

*Testudo caretta*, Linné, Syst. Nat. I 1766, p. 351.

*Thalasseochelys caretta*, Boulenger, Cat. Chel. 1889, p. 184 (s. syn.).

*Caretta caretta*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 549 (s. syn.).

Carapace arched or tectiform; in young specimens with three strong keels; dorsal shields juxtaposed; margin composed of 27, sometimes 25 shields, serrated posteriorly in the young; five pair of costals or more. Plastron rounded anteriorly; intergular shield very small or absent; a series of inframarginal shields. Head broad and large; two pair of praefrontal shields; jaws strong, hooked; mandibular symphysis very long; horny sheath with a median ridge on the alveolar surface, jaws without. Tail short. Limbs flat, with two claws in the young, one in the adult; fore limbs long.

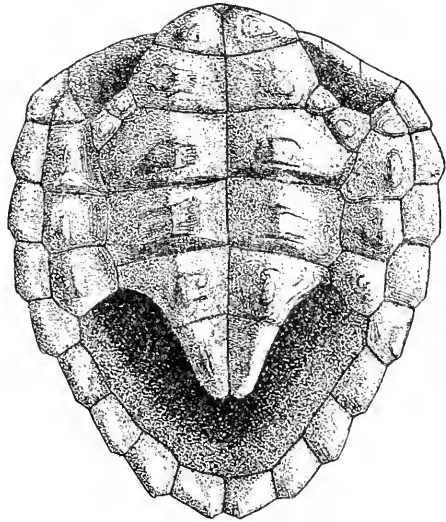


Fig. 118. *Caretta caretta* (L.) Plastron.

Brown above, yellowish

beneath. Young specimens dark brown or black. Length of shell 1050 mm.

Habitat: Java (Batavia); Solor Island!; Borneo; Celebes (Manado); Ambon!; Aru Islands; New Guinea (Mansinam). — Malay Peninsula; Bay of Bengal; Ceylon; Philippines; N. & W. Australia; Cape of Good Hope; W. Indies; Brazil; Mediterranean; Atlantic Ocean; North Sea.

The Loggerhead Turtle is carnivorous, feeding on crustaceans and molluscs.

## 4. Fam. DERMOCHELYIDAE.

Shell without epidermal shields; vertebrae and ribs free, separated from the bony exoskeleton, which consists of mosaic-like juxtaposed plates. Neck incompletely retractile; ear hidden. Plastron reduced; eight plastral bones, no entoplastron. Limbs paddle-shaped, without claws.

Marine.

A single genus.

1. *Dermochelys* Blainv.

(BLAINVILLE, Journ. de Phys. LXXXIII p. 259, 1816).

Head covered with small horny shields, which disappear with age; upper jaw in the middle with two triangular points

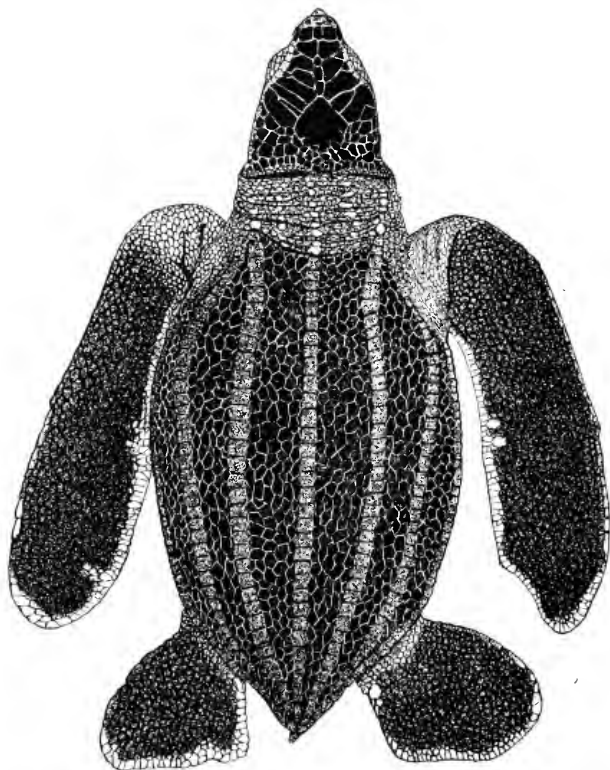


Fig. 119. *Dermochelys coriacea* (L.). Young specimen, nat. size.

between three deep notches; jaws sharply edged, alveolar region not enlarged. Dorsal shield with seven, ventral shield with five keels. Limbs paddle-shaped, without claws.

Distribution. Atlantic, Indian & Pacific Oceans, sometimes found in the Mediterranean.

A single species, the Leathery Turtle.

1. *Dermochelys coriacea* (L.).

*Testudo coriacea*, Linné, Syst. Nat. I 1766, p. 350.

*Dermochelys coriacea*, Boulenger, Cat. Chelon. 1889, p. 80 (s. syn.).

*Dermochelys coriacea*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 553 (s. syn.).

Dorsal shield consisting of a mosaic of numerous polygonal bony plates of unequal size, the largest forming seven keels; a pointed supracaudal portion covers the tail. In young speci-

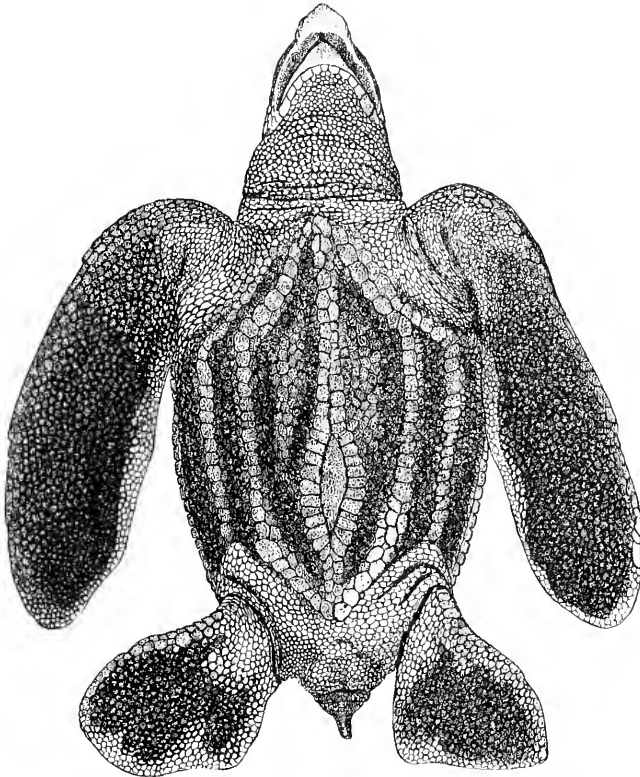


Fig. 120. *Dermochelys coriacea* (L.). Ventral view of same specimen.

mens the shield is soft and leathery. Ventral shield continuous with the dorsal, with five ridges of enlarged tubercles; it remains soft, the keels and a few bony tubercles excepted. Head covered with small shields. Fore limbs in the young as long

as the dorsal shield, the digits being long, in the adult shorter; limbs paddle-shaped, no claws.

Dark brown above, with or without yellow spots; in the young longitudinal keels yellow and limbs bordered with yellow. Length nearly  $2\frac{1}{2}$  M.

Habitat: The Indian Ocean, generally distributed: Sumatra (Padang); Solor Island near the eastern coast of Flores!; New Guinea (Bogadjim). — Coast of the Malay Peninsula, Tenasserim; Pacific Ocean: Solomon Islands, New Zealand. Atlantic Ocean: Cape of Good Hope. Occasionally in temperate seas: Arabia, Dalmatia.

### 5. Fam. CHELYIDAE.

Shell covered with epidermal shields. Neck always exposed, bending sideways. Plastron large; nine plastral bones. Digits moderate, with four or five claws.

#### Key to the Indo-Australian genera.

- A. Jaws weak; neck longer than the dorsal vertebral column; intergular large, behind the gulars; first vertebral shield longer than second . . . . . 1. *Chelodina* p. 314.  
 B. Jaws strong; neck shorter than the dorsal vertebral column; intergular between the gulars; first vertebral shield shorter than second. . . . . 2. *Emydura* p. 317.

#### 1. *Chelodina* Fitz.

(FITZINGER, N. Class. Rept. p. 6, 1826).

Jaws weak, without alveolar ridges; no parieto-squamosal arch. Neck longer than the dorsal vertebral column. Neural plates absent; nuchal shield present; plastron as large as or smaller than the opening of the shell; intergular large, behind the gulars. Limbs with four claws, digits entirely webbed.

Distribution. Australia; New Guinea.

#### Key to the Indo-Australian species.

- A. Intergular more than twice as long as the suture between the pectorals. . . . . 1. *C. novae-guineae* p. 315.  
 B. Intergular not twice as long as the suture between the pectorals, which are at least as long as the intergular.

- I. Second and third vertebrae more broad than long, as broad as the costals; nuchal shield one time and one fourth as long as broad; intergular one time and two thirds the length of the suture between the pectorals . . . . . 2. *C. siebenrocki* p. 316.
- II. Second and third vertebrae more long than broad, narrower than the costals; nuchal shield as long as broad or a little more broad than long; intergular as long as or slightly longer than the suture between the pectorals. . . . . 3. *C. oblonga* p. 316.

### 1. *Chelodina novae-guineae* Blgr.

*Chelodina novae-guineae*, Boulenger, Ann. Mus. Civ. Genova (2) VI 1888, p. 450  
Cat. Chel. 1889, p. 215 pl. 5—6.

*Chelodina novae-guineae*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 571.

Carapace oval, broadest behind, with a slight vertebral depression in large specimens. Nuchal large, about one time

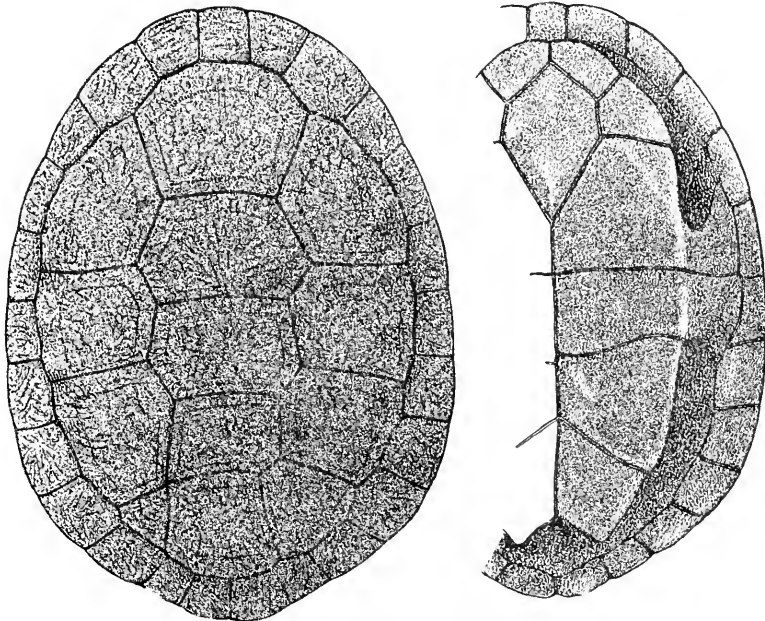


Fig. 121. *Chelodina novae-guineae* Blgr. Specimen of 104 mm. length.

and a half as long as broad; first vertebral narrower than second; second and third more broad than long and broader than the costals, fourth smallest; dorsal shields vermiculated, with radiating striae in the young. Plastron not very large,

front lobe a little broader than hind lobe, narrower than the carapace; intergular shield very large, three times as long as the suture between the pectorals; suture between the anals longest. Head moderate, narrow; the skin behind the eyes divided into small shields; mandibular symphysis a little longer than half the diameter of the orbit. Fore limbs with a series of five transverse lamellae on the upper surface; digits entirely webbed, with four claws.

Brown above, chestnut-brown or yellowish-brown below  
Length of shell 180 mm.

Habitat: Rotti!; New Guinea (Katow). — Queensland.

## 2. *Chelodina siebenrocki* Werner.

*Chelodina siebenrocki*, Werner, Verh. Zool. bot. Ges. Wien LI 1901, p. 602, Taf. 5.

*Chelodina siebenrocki*, Douglas Ogilby, Proc. Roy. Soc. Queensl. XIX 1905, p. 23, 30.

*Chelodina siebenrocki*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 572.

Carapace oval, depressed, vertebral region flat. Nuchal shield one time and one fourth as long as broad; first vertebral broader than second; second and third more broad than long, as broad as the costals; fifth smallest; posterior costals and vertebrae with longitudinal rugosities. Plastron moderate, its anterior lobe much narrower than the carapace; intergular one time and two thirds as long as the pectoral suture, twice as long as broad; suture between the pectorals longest, one time and a half as long as that between the femorals, two times and one third as long as that between the abdominals. Head very long and narrow, nearly twice as long as broad; skin of head divided into small shields behind the eyes, undivided in the median line. Lower jaw weak, symphysis one third of the diameter of the orbit; two very small barbels may be present. Fore limbs with a series of seven or eight broad, band-like lamellae on the anterior part; digits entirely webbed, with four claws. Black above, dark brown below. Length of shell 165 mm. (After Werner, not seen by me).

Habitat: German New Guinea.

## 3. *Chelodina oblonga* Gray.

*Chelodina oblonga*, Gray, in Grey's Trav. Austr. II 1841, p. 446.

*Chelodina oblonga*, Boulenger, Cat. Chel. 1889, p. 216.

*Chelodina oblonga*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 572.

*Chelodina rugosa*, Douglas Ogilby, Rec. Austr. Mus. I 1890, p. 56, pl. 7.



Carapace long and narrow, posteriorly slightly broader than anteriorly, males with a feeble vertebral keel; the shields rugose. Nuchal shield as long as broad or a little more broad than long; first vertebral broader than second; second and third more long than broad, narrower than the costals; fifth smallest. Plastron long and narrow, cruciform, front lobe much narrower than the carapace anteriorly, its longest portion more than twice as long as broad; intergular as long as or a little longer than the suture between the pectorals; pectorals largest; suture between the anals as long as or shorter than that between the femorals. Head small and narrow. Fore limbs with a series of six to nine transverse lamellae; digits entirely webbed, with four claws.

Brown above, yellow below. Young specimens dark olive above, the shields bordered by narrow black lines, sometimes with black dots. Length of shell 230 mm. (Not seen by me).

Habitat: Saibai Island off South coast of New Guinea. — Prince of Wales Island; Thursday Island; Cape York; N. & W. Australia.

## 2. *Emydura* Bp.

(BONAPARTE, Arch. f. Naturg. I p. 140, 1838).

Jaws very strong, no alveolar ridges; parieto-squamosal arch broad and short; parietal bones forming a roof; mandibular symphysis at least as broad as the diameter of the orbit; chin with or without short barbels. Neck shorter than the vertebral column. Neural plates absent; nuchal shield present or absent; plastron large; intergular between the gulars. Fore limbs with five, hind limbs with four claws, digits entirely webbed.

Distribution. Australia; New Guinea.

### Key to the Indo-Australian species.

4. Upper surface of neck with small round tubercles; nuchal shield present; barbels very small or absent.
  - I. The width of the bridge narrower than one third the length of the plastron.
    - a. Barbels present . . . . . 1. *E. macquarri* p. 318.
    - b. No barbels at all.
      1. Plastron broadly rounded anteriorly; a yellow band between the eye and the ear, and another from the corner of the mouth along the neck . . . . . 2. *E. krefftii* p. 318.

2. Plastron obtusely pointed anteriorly; a yellow band from the nostril to above the ear, passing on the upper eyelid, two others on the upper and lower jaw . . . . . 3. *E. albertisi* p. 319.
- II. The width of the bridge at least one third the length of the plastron; barbels present. . . . . 4. *E. subglobosa* p. 319.
- B.* Upper surface of neck with conical, erect tubercles; barbels present, conical.
1. Nuchal absent . . . . . 5. *E. branderhorsti* p. 320.
2. Nuchal present.
- a. Tail longer than the head . . . . . 6. *E. schultzei* p. 321.
- b. Tail shorter than the head. . . . . 7. *E. novae-guineae* p. 321.

### 1. *Emydura macquarri* (Gray).

*Hydraspis macquarrii*, Gray, Syn. Rept. 1831, p. 40.

*Emydura macquariae*, Boulenger, Cat. Chel. 1889, p. 230 (s. syn.).

*Emydura macquarrii*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 583.

Carapace a little depressed, usually with a distinct vertebral groove, two times and a half to three times as long as high; posterior margin expanded, not or slightly serrated. Nuchal shield well developed; the shields with longitudinal or vermicular rugosities or impressions. Plastron rounded anteriorly, notched posteriorly, more than three times as long as the width of the bridge; intergular shield larger than gulars, not quite twice so long as broad. Head with two small barbels; neck above with round warts. Fore limbs with five, hind limbs with four claws; digits entirely webbed.

Carapace olive or olive-brown; plastron pale olive; soft parts brownish; a yellow band from the angle of the mouth passing below the ear to the neck. Length of shell 270 mm.

Habitat: New Guinea (Fly river, Sepik river). — Australia: Victoria river, Burnett river, Adelaide, lake George.

### 2. *Emydura krefftii* (Gray).

*Chelymys krefftii*, Gray, Ann. Nat. Hist. (5) VIII 1871, p. 366.

*Emydura krefftii*, Boulenger, Cat. Chel. 1889, p. 231.

*Emydura krefftii*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 583.

Carapace a little depressed, oval, two times and two fifths to three times as long as high, posterior margin less expanded than in the preceding species, not or a little serrated. Nuchal

shield well developed. Plastron truncate or broadly rounded anteriorly, more than three times as long as the width of the bridge; intergular shield large, not quite twice so long as broad. No barbels. Fore limbs with five, hind limbs with four claws; digits entirely webbed.

Coloration as in *E. macquarri*; a yellow band between the eye and the ear and another from the corner of the mouth along the neck. Length of shell 250 mm.

Habitat: New Guinea (Erima on Astrolabe Bay). — Australia: Queensland, Burnett river, Rockhampton, Port Bowen.

### 3. *Emydura albertisi* Boulenger.

*Emydura albertisii*, Boulenger, Ann. Mus. Civ. Genova (2) VI 1888, p. 449;

Cat. Chel. 1889, p. 232.

*Emydura albertisii*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 584.

Carapace oval, keeled in the male, convex and rugose in the female, two times and a half as long as high; posterior margin not or slightly serrated. Nuchal shield well developed. Plastron obtusely pointed and somewhat narrower anteriorly; intergular shield nearly twice as long as broad. No barbels. Fore limbs with five, hind limbs with four claws; digits entirely webbed.

Carapace blackish-brown; plastron bright yellow; on the bridge an olive band, bordered by brown; soft parts dark brown; a yellow band beginning at the nostril, passing on the upper eyelid to above the tympanum, two others on the upper and lower jaw. Length of shell 160 mm.

Habitat: New Guinea (Katow, Lorentz river!).

### 4. *Emydura subglobosa* (Kreffit).

*Euchelymys subglobosa*, Kreffit, Ann. Mus. Civ. Genova VIII 1876, p. 390.

*Emydura subglobosa*, Boulenger, Cat. Chel. 1889, p. 232.

*Emydura subglobosa*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 584.

Carapace very convex, oval, with a linear vertebral groove, a little more than twice as long as high; posterior margin not or slightly serrated. Nuchal shield present, one time and two thirds to two times and a half as long as broad (sometimes absent); the dorsal shields rugose. Plastron broad anteriorly, three times as long as the width of the bridge; intergular shield large, larger than the gulars, one time and a third to two times as long as broad. Two small barbels present. Fore

limbs with five, hind limbs with four claws; digits entirely webbed.

Carapace brown; plastron yellow; soft parts brown; a yellow band from the tip of the snout passing through the eye, to

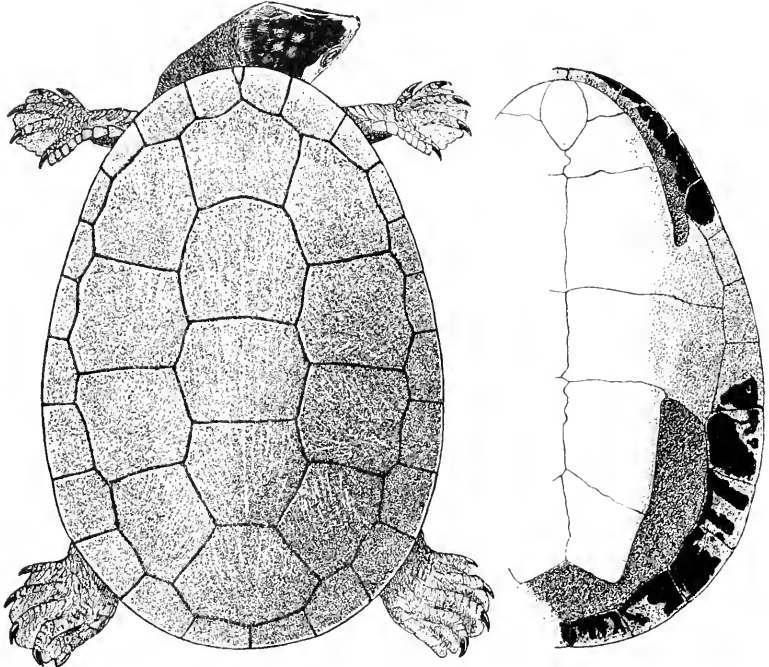


Fig. 122. *Emydura subglobosa* (Krefft).

above the ear; on both jaws a yellow band. Length of shell 220 mm.

Habitat: New Guinea (Naiabui on Amama river, Port Moresby, Lorentz river!, Mimika and Stekwa rivers).

##### 5. *Emydura branderhorsti* Ouwens.

*Emydura branderhorsti*, Ouwens, Contrib. faune Ind. Neerland. I 1914, p. 3.

Carapace convex, oval, with a linear vertebral groove. Nuchal shield absent. Plastron a little longer than twice the width of the bridge. Two pair of barbels, one pair small, the other big.

Dark green-brown above, yellow inferiorly; soft parts grey; a yellow band from the symphysis of the jaws to below the tympanum. Length of shell 382 mm. (After Ouwens, not seen by me).

Habitat: South New Guinea.

6. *Emydura schultzei* Vogt.

*Emydura schultzei*, Vogt, Sitz. ber. Ges. naturf. Fr. N<sup>o</sup>. 9 1911, p. 410.

Carapace convex, posteriorly flat, with a distinct vertebral keel on the posterior half of each vertebral shield; posterior margin serrated, the two supracaudals emarginated. Nuchal shield narrow; dorsal shields with concentric and radiating figures. Plastron narrow, four times and a half as long as the width of the bridge; intergular shield narrowed anteriorly, not quite twice so long as broad; abdominals very narrow, the abdominal suture one fourth of the pectoral suture; bridge very narrow; axillary and inguinal shields present. Head triangular, with small round warts on each side; two short barbels on the chin; neck with conical, round warts. Tail longer than the head. Fore limbs with five, hind limbs with four claws; digits entirely webbed.

Carapace dark brown; each shield with a dark spot near the hind border, in the middle of dark, irregular streaks, which are sometimes broken up into spots; plastron light brown; soft parts olive-brown above, greenish-yellow beneath; a broad dark streak on the head between the eyes, another on the median line of the occiput and a dark spot on each side of the latter. Length of shell 143 mm. (After Vogt, not seen by me).

Habitat: New Guinea (river, west of the mouth of the Tami).

7. *Emydura novae-guineae* (Meyer).

*Platemys novae-guineae*, Meyer, Mon. Acad. Berl. 1874, p. 128.

*Emydura novae-guineae*, Boulenger, Cat. Chel. 1889, p. 233.

*Emydura novae-guineae*, Siebenrock, Zool. Jahr. Suppl. X 1909, p. 585.

Carapace depressed, with a keel on the posterior part of each vertebral shield, sometimes a distinct vertebral groove; posterior margin serrated. Nuchal shield moderate, one time and a third to two times as long as broad; vertebrals broad in females, narrower in males; dorsal shields with vermicular impressions in males, with concentric figures in females<sup>1)</sup>. Plastron narrow, rounded anteriorly, three times as long as the width of the bridge; intergular shield very narrow, one time and two thirds to three times and a half as long as broad.

1) Dimorphismus bei *Emydura novae-guineae* (Meyer), Siebenrock, Zool. Anz. XL 1912, p. 301; Nelly de Rooy, Zool. Anz. XLII 1913, p. 2.

Head with two short barbels; neck with long, erect tubercles. Tail shorter than the head. Fore limbs with five, hind limbs with four claws, digits entirely webbed.

Carapace dark brown, a small black spot on each vertebral and costal shield near the hind border, sometimes very indistinct; plastron yellowish; soft parts greyish above, yellowish below, these two colours sharply separated in the head and neck, where the upper jaw is greyish, the lower one yellow; a yellowish streak on each side, becoming indistinct in adult specimens, from behind the eye to above the tympanum and continued anteriorly in the interorbital space, where they meet. Length of shell 220 mm.

**Habitat:** Waigeu!; New Guinea (Fak Fak, Passim, Sekanto river!, Sinái river!, lake Sentani!, Mimika, Stekwa and Lorentz! rivers, Merauke!, Stephansort, Bogadjim, Katow).

Eggs have been found, measuring 30 by 55 mm.

#### 6. Fam. CARETTOCHELYIDAE.

Shell without epidermal shields. Neck retractile; ear hidden; jaws without fleshy lips; snout ending in a proboscis. Plastron large, united with the carapace, composed of nine bones. Limbs broad and flat, with two claws.

A single genus.

##### 1. *Carettochelys* Ramsay.

(RAMSAY, Proc. Linn. Soc. N. S. Wales (2) I p. 158, 1886).

Head large, covered with undivided skin, and with a fleshy proboscis; orbits lateral; temporal arch very broad; jaws strong. Six or seven (8) neural plates; 21 marginalia. Limbs broad, flat, with two claws. Tail short.

Distribution. New Guinea.

A single species, living in rivers, down to the sea.

##### 1. *Carettochelys insculpta* Ramsay.

*Carettochelys insculpta*, Ramsay, Proc. Linn. Soc. N. S. Wales (2) I 1886, p. 158, pl. III, IV.

*Carettochelys insculpta*, Boulenger, Cat. Chelon. 1889, p. 236; Proc. Zool. Soc. London 1898, p. 851; Transact. Zool. Soc. London XX Part V 1914, p. 253, pl. 28 fig. 1.

- Carettochelys insculpta*, Baur, Americ. Naturalist 25 1891, p. 631, pl. 14—16  
 Science 17 1891, p. 190.  
*Carettochelys insculpta*, Gadow, Cambr. Nat. Hist. 8 Rept. 1901, p. 404.  
*Carettochelys insculpta*, Waite, Rec. Austr. Mus. VI 1905, p. 110, fig. 30—32,  
 pl. 24—28.  
*Carettochelys insculpta*, Douglas Ogilby, Proc. Roy. Soc. Queensland XIX  
 1905, p. 28.  
*Carettochelys insculpta*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 588.  
*Carettochelys insculpta*, Longman, Mem. Queensl. Mus. II 1913, p. 39.

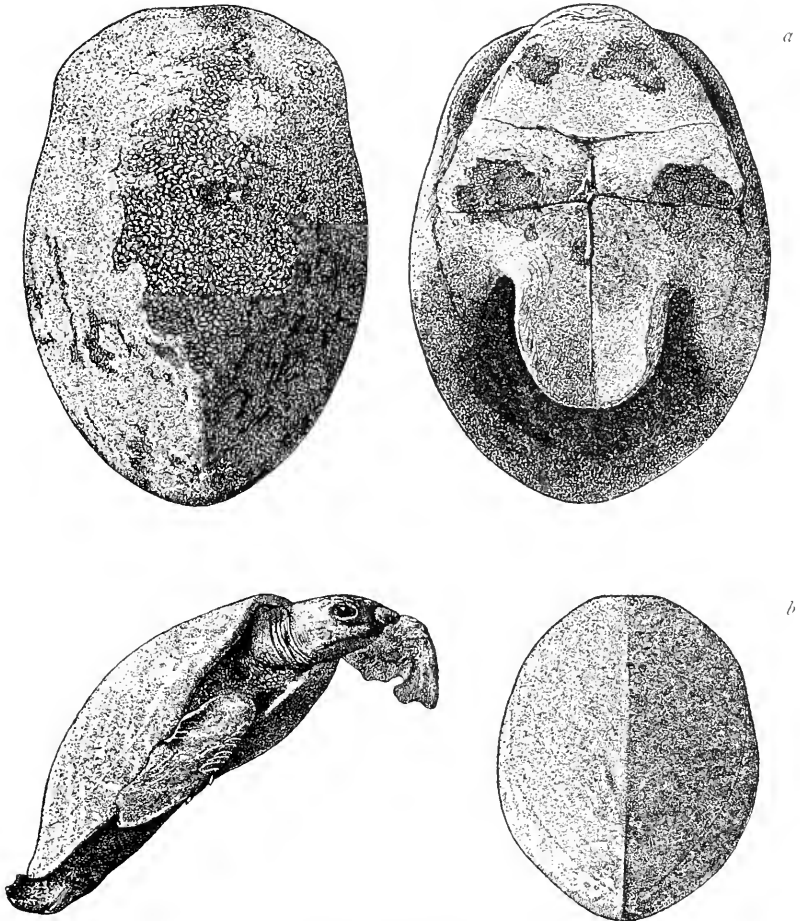


Fig. 123. *Carettochelys insculpta* Ramsay.  
 a. Specimen of 455 mm. length,  
 b. Younger specimen, showing a strong dorsal keel,  $\times \frac{1}{7}$ .

Carapace oval, keeled posteriorly, the keel strongly marked in young specimens (fig. 123 *b* and 124); margin of carapace

strongly serrated in very young specimens (fig. 124 *a*); six or seven (8) neural plates, separated by the costals in adult

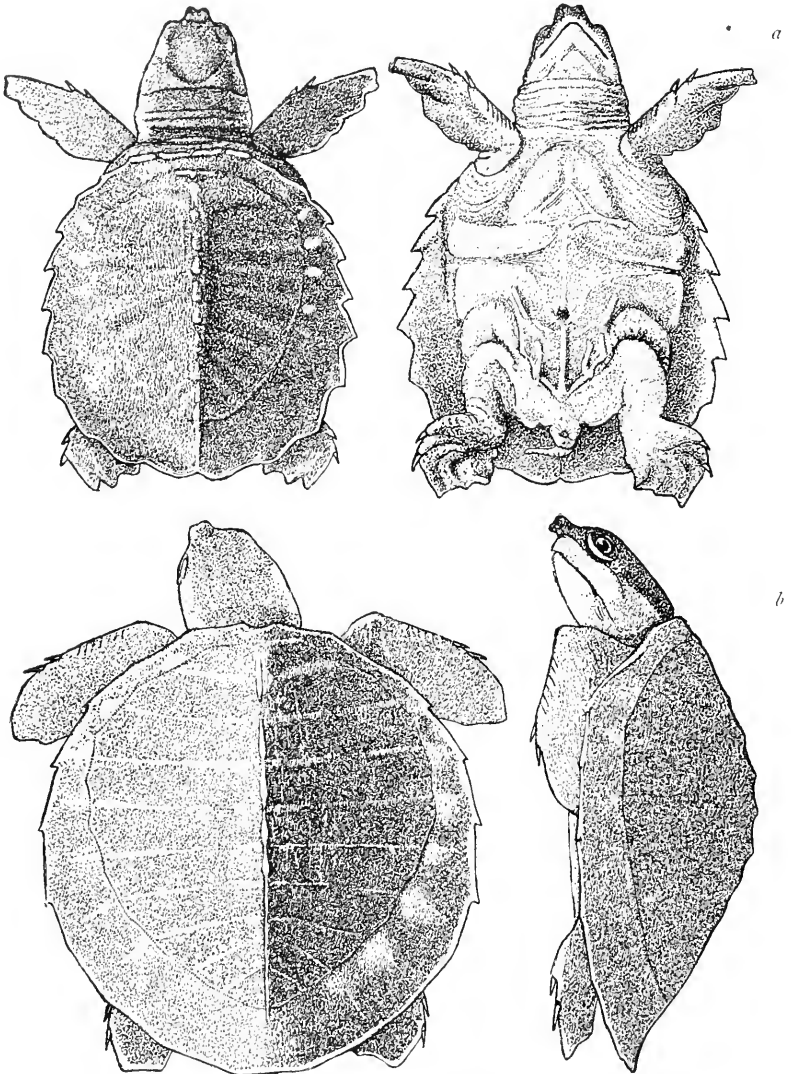


Fig. 124. *Carettochelys insculpta* Ramsay.  
*a.* New-born specimen of 55 mm.  
*b.* Specimen of 94 mm. Margin still serrated.

specimens; nuchal large; 21 marginals, the pygo-marginal being single. Plastron solid, formed of nine shields. All the plates



of the shell with irregular wavy raised lines (fig. 125). Head large, covered with undivided skin, snout prominent, ending in a fleshy, thick proboscis, bent downwards; nostrils situated superiorly; eyes lateral; neck short. Limbs flat, webbed to the tips of the digits, with two claws; fore limb longer than hind limb, with 7—9 broad transverse band-like scales anteriorly and three to four transversely enlarged scales at the posterior margin. Tail short, with 14—16 curved shields above.

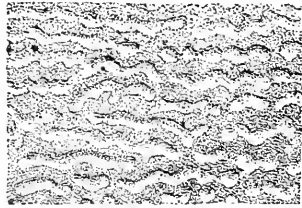


Fig. 125.  
*Carettochelys insculpta* Ramsay.  
Fragment of costal plate, nat. size.

Brown above and below. Length of shell 495 mm.

Habitat: New Guinea (Strickland river, Dameracura and Kiwai Island at the mouth of the Fly river, Morehead river, Merauke!, Lorentz river!, Stekwa river!, Lake Jamur!).

The female deposits 17—27 round eggs (fig. 102 *b*).

#### 7. Fam. TRIONYCHIDAE.

No epidermal shields on the carapace and plastron, but skin covering them. Head and neck completely retractile; ear hidden; jaws covered by fleshy lips; snout ending in a proboscis. Plastron small, connected with the carapace by skin. Tail very short. Limbs with distinct digits, with three claws.

Aquatic turtles, living in rivers and ponds; *Pelochelys* enters the sea. Carnivorous.

Nom. indig. Labi labi.

#### Key to the Indo-Australian genera.

A. Plastron without cutaneous valves.

I. Orbit nearer the temporal than the nasal fossa;  
proboscis long.

a. The 8 pair of costals separated in the middle by  
the neurals; postorbital arch keeled exteriorly . . . 1. *Dogania* p. 326.

b. Last pair of costals in contact in the median line;  
postorbital arch flat exteriorly . . . . . 2. *Trionyx* p. 327.

II. Orbit nearer the nasal than the temporal fossa;  
proboscis short. . . . . 3. *Pelochelys* p. 331.

B. Plastron with a cutaneous valve, which may cover the

hind limb. . . . . 4. *Emyda* p. 332.

1. *Dogania* Gray.

(GRAY, Cat. Tort. p. 49, 1844).

Orbits nearer the temporal than the nasal fossa; postorbital arch narrow, forming a keel exteriorly; bony choanae between the orbits; jaws strong. Eight neurals, separating all the 8 pair of costal shields. Plastral callosities absent or feebly developed; no median continuation of the hypoplastron.

Distribution. Malay Peninsula; Sumatra; Natuna Islands; Borneo; Java; Philippines.

A single species.

1. *Dogania subplana* (Geoffr.).

*Trionyx subplanus*, Geoffroy, Ann. Mus. Paris XIV 1809, p. 11, pl. V fig. 2.

*Trionyx subplanus*, Boulenger, Cat. Chel. 1889, p. 246 (s. syn.).

*Trionyx pecki*, Bartlett, Sarawak Gazette 1 Febr. 1895, p. 30.

*Dogania subplana*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 606.

*Dogania subplana*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 154.

Dorsal disk flat, oval; a large fontanelle between the nuchal

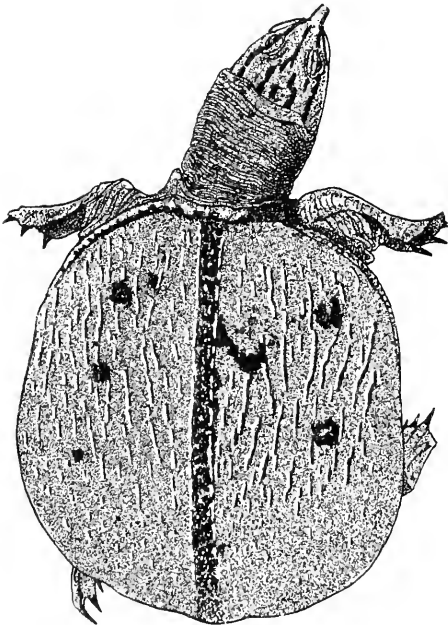


Fig. 126. *Dogania subplana* (Geoffr.).  
Young specimen,  $\times \frac{5}{6}$ .

and dorsal plates; eight costals on each side, separated from one another by the neurals; a single neural between the first pair of costals; the plates finely granulate and vermiculate. Dorsal skin in young specimens with interrupted longitudinal lines. Epiplastra long, separated in the middle; entoplastron forming a straight or an obtuse angle; callosities usually present on the hyo-, hypo- and xiphiplastra. Head very large; proboscis long; mandibular symphysis narrower than the diameter of the orbit, without median ridge.

Tail very short. Limbs with three claws.

Olive-brown or yellowish above, sometimes dotted with dark brown. Young specimens with a black vertebral band and about 6 small ocelli; a black line from snout to temples, passing through the eye; an  $\Lambda$ -shaped black line on the occiput, with a median line in the posterior part. Lower parts yellowish. Length of disk 250 mm.

Nom. indig. Kuja (W. Java).

Habitat: Sumatra (Deli!, Gunung Sugei, Padang 1500—3000 feet, Taluk!, Gunung Sahilan!, Tandjong river in Batu Bahra); Singkep Island; Gr. Natuna Island; Borneo! (Kapuas river, Baram river, Kuching, Bongon, Saiap on Kina Balu); Java (Batavia, Buitenzorg, Sukabumi!, Malang!). — Malay Peninsula; Penang; Singapore; Tenasserim; Mergui Archipelago; Philippines.

## 2. *Trionyx* Geoffroy.

(GEOFFROY, Ann. Mus. Paris XIV p. 1, 1809).

Orbits nearer the temporal than the nasal fossa; postorbital arch flat exteriorly, narrower than the diameter of the orbit; bony choanae between the orbits; jaws strong. Seven or eight neurals in an uninterrupted series; last pair of costals forming a suture. Plastral callosities well developed, 2—7; a median continuation of the hypoplastron present. Eggs round, hard-shelled.

Distribution. Africa; Asia; N. America.

### Key to the Indo-Australian species.

- A. Two neural plates between the first pair of costals; plastral callosities very large. . . . . 1. *T. hurum* p. 328.
- B. A single neural plate between the first pair of costals.
- I. A strong longitudinal ridge on the alveolar surface of the mandibular symphysis.
- a. Plastral callosities feebly developed, finely sculptured. . . . . 2. *T. phayrei* p. 328.
- b. Plastral callosities well developed, deeply sculptured. . . . . 3. *T. cartilagineus* p. 329.
- II. No longitudinal ridge on the mandibular symphysis; plastral callosities well developed. . . . 4. *T. sinensis* p. 330.

1. *Trionyx hurum* Gray.

*Trionyx hurum*, Gray, Syn. Rept. 1831, p. 47, pl. X.

*Trionyx hurum*, Boulenger, Cat. Chel. 1889, p. 249 (s. syn.).

*Trionyx hurum*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 597.

*Trionyx hurum*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 160.

Disk as long as broad or a little more long than broad; two neurals between the first pair of costals; last pair of costals forming a suture; eight pair of costals; plates vermiculate. Young specimens with numerous longitudinal ridges of tubercles on the dorsal skin. Epiplastra narrowly separated; entoplastron forming an obtuse or a straight angle; callosities coarsely pitted and vermiculate, large, hyo- and hypoplastral, xiphiplastral and entoplastral in old specimens. Head moderate; snout a little longer than the diameter of the orbit; interorbital space broader than the nasal fossa; postorbital arch a little more than half the diameter of the orbit; mandibular symphysis flat or with a longitudinal groove, no ridge. Tail very short. Limbs with three claws.

Olive-brown above and beneath; head, neck, limbs and border of disk with light dots; some large yellow spots on the head: one across the snout, behind the eye, at the corner of the mouth and on the chin, becoming indistinct with age. Young specimens have four to six large ocelli on the disk, which is marbled with dark. Length of disk 409 mm. (Not seen by me).

Habitat: Borneo (Santubong on Sarawak river<sup>1</sup>). — Malay Peninsula?; Penang?; Bengal; Indo-China.

2. *Trionyx phayrei* Theob.

*Trionyx phayrei*, Theobald, Journ. Linn. Soc. X 1868, p. 18.

*Trionyx phayrii*, Boulenger, Cat. Chel. 1889, p. 251 (s. syn.).

*Trionyx phayrei*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 598.

*Trionyx phayrei*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 165.

A single neural between the first pair of costals; eight pair of costals, the last forming a suture; plates coarse and vermiculate. Epiplastra in contact in front of the entoplastron, which forms an obtuse or straight angle; callosities feebly developed, slightly sculptured. Head moderate; snout a little longer than the diameter of the orbit; postorbital arch not quite one third the diameter of the orbit; mandibular symphysis

1) See Shelford, J. Straits Br. Asiat. Soc. XXXV 1901, p. 46.

with a longitudinal ridge. Tail very short. Limbs with three claws.

Brown above; white below; head spotted or vermiculated above with black. Length of disk 500 mm.

Habitat: Sumatra (Deli, Muara Bukit Tinggi); Java (Buitenzorg!); Borneo (Akar river, Tandjong). — Malay Peninsula; Penang?; Tenasserim; Pegu; Burma.

### 3. *Trionyx cartilagineus* (Bodd.).

*Testudo cartilaginea*, Boddaert, Epistola ad W. Roëll, 1770.

*Trionyx cartilagineus*, Boulenger, Cat. Chel. 1889, p. 253 (s. syn.).

*Trionyx cartilagineus*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 599.

*Trionyx cartilagineus*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 168.

*Amyda cartilaginea*, Barbour, Mem. Mus. Comp. Zool. Harv. Coll. XLIV 1912, p. 144.

Disk as long as broad or a little more long than broad; a single neural between the first pair of costals; eight pair of costals, last forming a suture; plates coarse. Young specimens with longi-

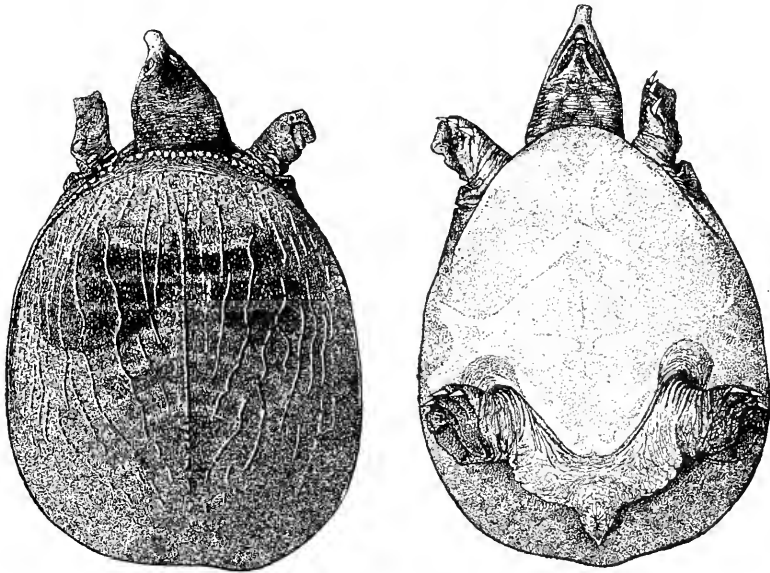


Fig. 127. *Trionyx cartilagineus* (Bodd.).

tudinal ridges of small tubercles on the dorsal skin. Epiplastra in contact or narrowly separated; entoplastron forming an obtuse or a straight angle; callosities well developed, coarsely sculptured, hyo-hyoplastral and xiphiplastral. Head moderate; snout much longer than the diameter of the orbit; postorbital

arch very narrow, one third to one fourth the diameter of the orbit; interorbital space as broad as or narrower than the nasal fossa; mandibular symphysis with a strong longitudinal ridge. Tail very short. Limbs with three claws.

Olive-brown above; head and chin with yellow spots, largest below the temple. Young specimens light-dotted above, some large black spots or a black transverse band on the back. Length of disk 720 mm.

Nom. indig. Kuja (W. Java).

Habitat: Sumatra (Labuan, Medan!, Gambir!, Bringin!, Wampu river in Langkat, Batu Bahra, Padang Bedagei, Serdang, Indragiri, Siboga, Gunung Sugei, Bangko river near Muara Labu, Sumanik river!, Singkarah!, Kaju tanam!, Taluk!, Djambi!, Padang!); Riou!; Java! (Buitenzorg, Djocjakarta, Ngawi); Borneo (Pata river, Kuching, Bau, Limbang, Baram, Sebruang Valley, Gunung Kalawat, Merabah, Selimbau!, Tandjong, Bandjermassin); Moluccas?. — Malay Peninsula; Burma; Cochin China

Lives in muddy rivers, ponds, swamps and estuaries; chiefly carnivorous.

#### 4. *Trionyx sinensis* Wiegman.

*Trionyx (Aspidonectes) sinensis*, Wiegmann, Nov. Act. Ac. Leop. Carol. XVII 1834, p. 189.

*Trionyx sinensis*, Boulenger, Cat. Chel. 1889, p. 256 (s. syn.).

*Trionyx cartilagineus* var. *newtoni*, Bethencourt Ferreira, J. Sc. Lisboa (2) V 1897, p. 114.

*Trionyx sinensis* var. *newtoni*, idem, p. 151.

*Trionyx sinensis*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 601 (s. syn.).

A single neural between the first pair of costals; eight pair of costals; plates pitted and vermiculate. Young specimens with longitudinal ridges of small tubercles on the dorsal skin. Epiplastra separated; entoplastron broad, forming an obtuse angle; callosities well developed, finely sculptured, hyo-hyoplastral, xiphiplastral and sometimes entoplastral. Head moderate; snout longer than the diameter of the orbit; interorbital space narrower than the nasal fossa; postorbital arch at least half the diameter of the orbit; mandibular symphysis without a ridge; no large tubercles on the neck. Tail very short. Limbs with three claws.

Olive above, uniform or dotted with light; below whitish; often a few black spots on the back; head with small spots; dark streaks radiating from the eye: a rostral, a temporal and

an interorbital; chin and throat dark, marbled with white. Young specimens usually with symmetrical black spots on the plastron; a pair of black spots in front of the tail and a black band on the posterior side of the thighs. Length of disk 200 mm.

**Habitat:** Timor. — Annam; Batanes Islands; Formosa; Japan; China.

### 3. *Pelochelys* Gray.

(GRAY, Proc. Zool. Soc. London p. 89, 1864).

Orbits nearer the nasal than the temporal fossa; postorbital arch as broad as the diameter of the orbit; bony choanae between the orbits; jaws weak; proboscis short. Eight neural plates; last pair of costals forming a suture. Four plastral callosities developed; median continuation of the hypoplastron present.

**Distribution.** India; Archipelago; Philippines.

A single species.

#### 1. *Pelochelys cantori* Gray.

*Pelochelys cantorii*, Gray, Proc. Zool. Soc. London 1864, p. 90.

*Pelochelys cantoris*, Boulenger, Cat. Chel. 1889, p. 263 (s. syn.).

*Pelochelys cantorii*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 607 (s. syn.).

*Pelochelys cantorii*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 168.

Dorsal disk flat, oval; eight pair of costal shields, the last pair forming a suture; a single neural between the first pair of costals; the plates coarse and vermiculate. Dorsal skin in young specimens tuberculate. Epiplastra small, widely separated; entoplastron forming a straight or an acute angle; four callosities well developed. Head moderate; proboscis short; snout short and broad; interorbital space broader than the greatest diameter of the orbit; lower jaw narrowest at the symphysis; neck with a few fringes of the skin on each side. Tail very short. Limbs with three claws.

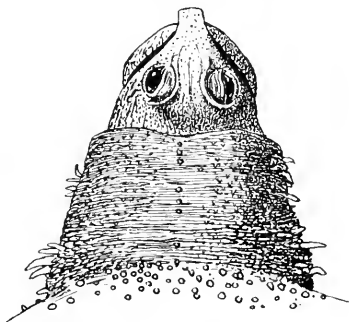


Fig. 128. *Pelochelys cantori* Gray.  
Head and neck,  $\times \frac{5}{6}$ .

Olive or brown above, uniform or spotted with dark brown; yellowish below. Young specimens with lips and throat speckled with white. Length of disk 1290 mm.; breadth 740 mm.

**Habitat:** Sumatra (Upper Langkat, Wampu river near

Sukaranda); Java (Tandjong Priok); Borneo! (Koelei, Koti); New Guinea (Lorentz river!, Stekwa river, Laloki river). — Malay Peninsula; Penang; Burma; Ganges; Bengal; Siam; Annam; China; Philippines.

This turtle is often caught on the sea-coast.

#### 4. *Emyda* Gray.

(GRAY, Syn. Rept. p. 49, 1831).

Postorbital arch narrower than the diameter of the orbit; bony choanae between the orbits; jaws strong. Seven or eight neurals in an uninterrupted series; eighth pair of costals large, forming a suture like the seventh; a praenuchal present; marginal bones only in the posterior part of the margin, not in connection with the discus. Seven plastral callosities present; the hind limb may be concealed under a cutaneous valve.

Distribution. The East-Indies.

A single species.

##### 1. *Emyda granosa* (Schoepff).

*Testudo granosa*, Schoepff, Test. 1792, p. 127, pl. XXX.

*Emyda granosa*, Boulenger, Cat. Chel. 1889, p. 269.

*Emyda vittata*, idem, p. 269.

*Emyda scutata*, idem, p. 270.

*Emyda granosa*, Siebenrock, Zool. Jahrb. Suppl. X 1909, p. 591 (s. syn.).

*Emyda granosa*, Annandale, Rec. Ind. Mus. VII part II 1912, p. 171.

Carapace uniformly granulate; two neurals between the first pair of costals; anterior marginal larger than the others. Dorsal skin in young specimens longitudinally plaited. Plastral callosities varying in size, the entoplastral smallest; epiplastra short and straight. Head moderate, snout short. Tail short. Limbs with three claws. Length of disk 250 mm.

This species may be divided into a number of local races. One of these: *Emyda granosa vittata* Ptrs., is distinguished from the others by being uniformly brown on carapace and head; head and neck usually have black streaks, becoming indistinct with age.

Habitat: Celebes?. — In a footnote on p. 591, Siebenrock states that a specimen of this form is preserved in the Vienna Museum, which apparently came from Celebes. This locality seems very doubtful; it occurs naturally in India (Madras Presidency, Mysore plateau up to 3000 feet, Bombay Presidency), living in ponds and lakes, where it undergoes a period of hibernation.



### III. Order EMYDOSAURIA.

Quadrate bone united to the skull, not movable; temporal region with two horizontal bony arches. Teeth present, implanted in alveoli of the jaws. Cervical and dorsal ribs mostly two-headed; sternum and interclavicle present; seven or eight transverse series of abdominal ribs, free from the vertebral ribs. Anal opening longitudinal; copulatory organ present, single.

A single family, with a wide distribution, occurring in tropical America, Africa, S. Asia, N. Australia.

#### 1. Fam. CROCODILIDAE.

Nostrils anterior; pupil vertical; ear with movable opercles; chænae far back between the pterygoids, which form a median suture like the palatines and maxillaries; orbit communicating with the infratemporal fossa. Back armed with bony plates. Fore limb with five digits, hind limb with four; the three inner digits clawed. Tail strong.

Carnivorous, aquatic reptiles, laying elongate eggs (fig. 130, 132) with a hard shell on the banks of the rivers in a hollow, covered up with sand. Two genera of six recent ones are represented in the Indo-Australian region.

- A. Snout long and very narrow;  $\frac{20-21}{18-19}$  teeth on each side . . . . . 1. *Tomistoma*, p. 333.  
B. Snout broad, tapering;  $\frac{16-19}{14-15}$  teeth on each side. . . . . 2. *Crocodilus*, p. 336.

#### 1. *Tomistoma* S. Müller.

(S. MÜLLER, Arch. F. Nat. p. 122, 1846).

Snout very long and narrow; 20 or 21 upper and 18 or 19 lower teeth on each side, the lateral mandibular received into pits; fifth maxillary tooth largest; first and fourth mandibular teeth fitting into notches of the upper jaw. Nasal bones not extending to the nasal opening, in contact with the prae-

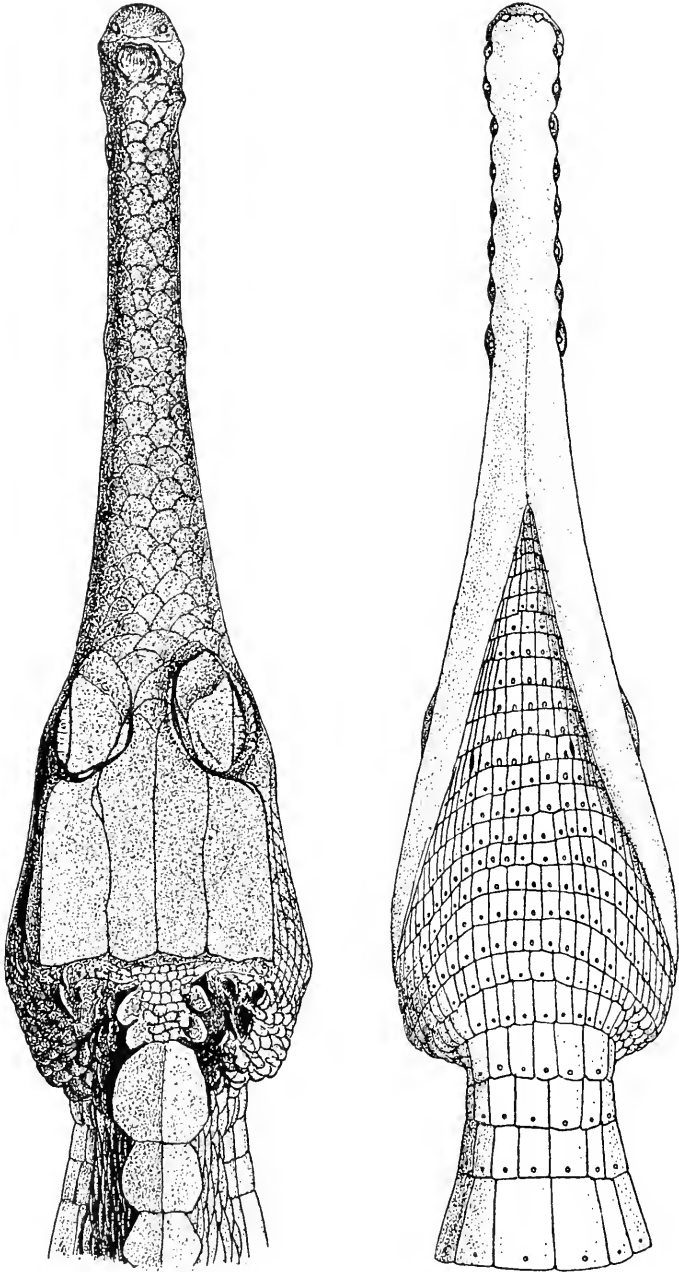


Fig. 129. *Tomistoma schlegeli* (S. Müll.). Head of young specimen,  $\times \frac{5}{6}$ .

maxillaries; nasal opening smaller than the supratemporal fossae; a small bony plate in the upper eyelid. Mandibular symphysis very long (fig. 129), extending to the 14<sup>th</sup> or 15<sup>th</sup> tooth. A dorsal shield of four longitudinal series of juxtaposed, keeled, bony scutes.

Distribution. Borneo; Sumatra; Malay Peninsula.

A single species.

1. *Tomistoma schlegeli* (S. Müll.).

*Crocodilus (Gavialis) Schlegelii*, S. Müller, Tydschr. v. Nat. & Physiol. V 1838, p. 77, pl. III.

*Tomistoma schlegelii*, Boulenger, Cat. Chel. 1889, p. 276 (s. syn.).

Snout three times to three times and a half as long as broad at the base; 20 or 21 upper teeth on each side; mandibular symphysis extending to the 14<sup>th</sup> or 15<sup>th</sup> tooth. Nuchal and dorsal scutes forming a continuous shield of 22 transverse series, the broadest dorsals containing 6 scutes, the four anterior, nuchals, composed of two, all keeled; two small postoccipital scutes. Fingers webbed at the base; outer toes broadly webbed; scales on the limbs keeled; a strong crest on the outer edge of the hind limb. Tail long, crested above.

Olive-green above, spotted with dark brown; back sometimes

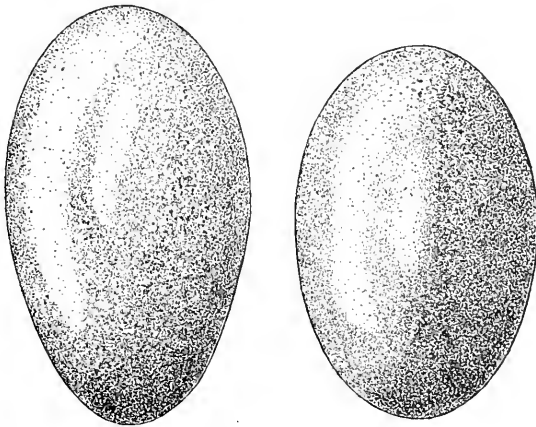


Fig. 130. Two eggs of *Tomistoma schlegeli* (S. Müll.),  $\times \frac{1}{2}$ .

with dark transverse bands; tail banded. Lower parts white. Iris yellowish-brown. Total length 4.70 Meter.

N o m. i n d i g. Buaia senjulong (mal.), Buaia sapit (S. Borneo), Bediai sampit (Dajak-name).

Habitat: Sumatra (Medan!, Ramolina!, Serdang! in Deli, Danau Kotta & Danau Baru in Indragiri, Blindahan river, Padang Bedagei, Laut Tador, Gunung Sahilan!, Djambi!); Borneo! (Sadong river in Sarawak!, Muka, Sinkawang, Pontianak, Bandjermassin, lake Lamuda, Kapuas river!, Muara Tebeh!). — Malay Peninsula.

Note. The Malay Charial, at first known from Borneo only, was discovered in Sumatra and the Malay Peninsula at about the same time (See Nelly de Rooy, in A. Maass: *Durch Zentral Sumatra*, Rept. 1912, p. 5). It is a freshwater crocodile, feeding on fish and not rare in the Sumatran rivers. Strauch mentions its occurrence in Java (*Synopsis Crocodil.* 1866, p. 62), but it has never been recorded from there again. This author did not see a Javanese specimen himself, but he says: "Ferner scheint diese Art auch auf Java einheimisch zu sein, zum Mindesten findet sich im Stuttgarter Museum ein Exemplar von dieser Art."

## 2. *Crocodilus Laurenti*.

(LAURENTI, *Syn. Rept.* p. 53, 1768).

Snout broad and long; 16 to 19 upper and 14 or 15 lower teeth on each side; fourth or fifth maxillary tooth largest; fourth mandibular tooth usually fitting in a notch of the upper jaw. Nasal bones extending to the nasal opening, which is larger than the supratemporal fossae; a very small bony plate in the upper eyelid. Mandibular symphysis usually extending to the fourth or fifth tooth (fig. 131), not beyond the eighth. A dorsal shield of four or more longitudinal series of juxtaposed, keeled bony scutes.

Distribution. S. Asia; N. Australia; Africa; tropical America.

### Key to the Indo-Australian species.

- A. Snout from one time and a half to two times and one fourth as long as broad at the base.
- I. A longitudinal ridge on the snout, beginning at the eyes; postoccipitals usually absent. . . . . 1. *C. porosus* p. 337.
  - II. A longitudinal ridge between the orbits, not extending on the snout; two pair of postoccipitals present. . . . . 2. *C. siamensis* p. 338.
- B. Snout not more than one time and a half as long as broad; no ridges on the snout. . . . . 3. *C. palustris* p. 339.

1. *Crocodylus porosus* Schneider.

*Crocodylus porosus*, Schneider, Hist. Amph. II 1801, p. 159.

*Crocodylus porosus*, Boulenger, Cat. Chel. 1889, p. 284 (s. syn.).

Snout one time and two thirds to two times and one fourth as long as broad at the base, with a strong ridge on each side in front of the eye, converging towards its fellow; 17—19

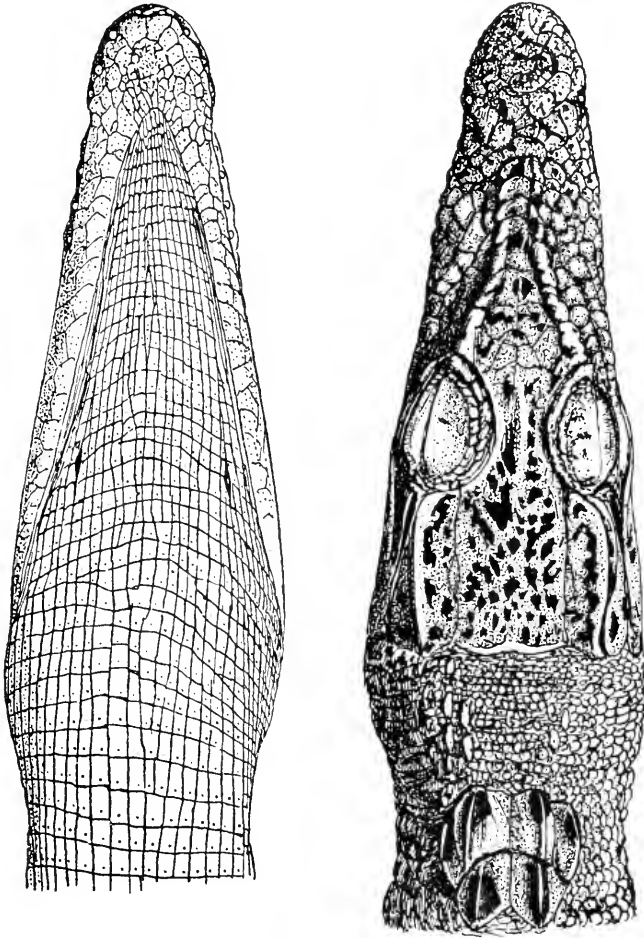


Fig. 131. *Crocodylus porosus* Schn. Head of young specimen, nat. size.

upper teeth on each side, four teeth in each premaxillary; mandibular symphysis extending to the fifth tooth. Postoccipital scutes usually absent, sometimes small and irregular; four large nuchals in a square, with one or two smaller ones on

each side. Dorsal shield separated from the nuchal, formed by 16 or 17 transverse and 4 to 8 longitudinal series of bony scutes, which are separated from each other in a transverse series by the skin. Scales on sides and limbs smooth or feebly keeled. Fingers webbed at the base; outer toes broadly webbed; a serrated fringe on the outer side of the hind limb. Tail strong, crested.

Dark olive above; yellow below. Young specimens pale olive, black-dotted on the head and with large black spots on body and tail. Total length reaches about 10 M.

Nom. indig. Buaia (mal.), Rawing (Dajak-name).

Habitat: Simalur!; Sumatra (Deli!, Langkat, Padang Bedagei, Indragiri, Batu Bahra, Palembang!, Padang, Bangkinang!); Riou; Java! (Buitenzorg!, Indramaju!, Pekalongan!); Timor; Borneo! (Labuan, Sebruang Valley, Baram river, Sarawak river, Bandjermassin); Celebes! (Gorontalo, Manado, Kema, Tjenrana near Pampanua!, lake Tondana!, Lapa lupa river near Tempe!, Maros, Tello!, Macassar); Ambon!; Batjan; Ternate; Halmahera!; Aru Islands; New Guinea! (Sekä!, Moaif!, Tawarin!, lake Sentani!, Ramoi, Utumbuwe river!, Digul river!, Fly river, St. Joseph's river, Gerekanumu). — N. Australia; Solomon Islands; Fiji Islands; Philippines; Malay Peninsula; Singapore; Burma; India; Ceylon; Siam; S. China.

A common crocodile in the lower part of large rivers, sometimes caught at sea; dangerous to men.

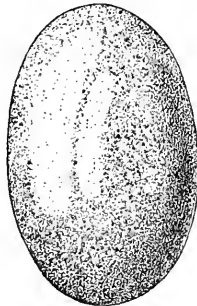


Fig. 132. Egg of *Crocodilus porosus* Schn.,  $\times \frac{1}{2}$ .

## 2. *Crocodilus siamensis* Schneider.

*Crocodilus siamensis*, Schneider, Hist. Amph. II 1801, p. 157.

*Crocodilus siamensis*, Boulenger, Cat. Chel. 1889, p. 282 (s. syn.).

Snout one time and three fourths as long as broad at the

base, without distinct ridges; 18 upper and 15 lower teeth on each side; mandibular symphysis extending to the fourth tooth; interorbital region broad, with a median longitudinal ridge. Two pair of postoccipital scutes in a transverse series; four large nuchals in a square, with a smaller one on each side. Dorsal shield separated from nuchal, formed by 16 transverse and 4 or 6 longitudinal series of bony scutes, strongly keeled; one or two longitudinal series of small scutes on each side. Fingers with a short web, outer toes broadly webbed; a serrated fringe on the outer side of the hind limb; scales on the limbs strongly keeled. Tail strong, crested.

Dark olive above, spotted with black. Total length 1.38 M. and more.

Habitat: Java!. — Siam; Cambodja.

Rare.

### 3. *Crocodylus palustris* Lesson.

*Crocodylus palustris*, Lesson, in Bélanger, Voyage Ind. Or. Zool. 1834, p. 305.

*Crocodylus palustris*, Boulenger, Cat. Chel. 1889, p. 285 (s. syn.).

Snout one time and one third to one time and a half as long as broad at the base, without ridges; 19 upper teeth on each side, five teeth in each praemaxillary; mandibular symphysis extending to the fourth or fifth tooth. Two pair of postoccipital scutes in a transverse series; four large nuchals in a square, with a smaller one on each side. Dorsal shield separated from the nuchal, formed by 16 or 17 transverse and 4, rarely 6, longitudinal series of bony scutes, which are united by suture to one another in a transverse series. Fingers webbed at the base; outer toes broadly webbed; a serrated fringe on the outer side of the hind limb; scales on the limbs keeled.

Dark olive or blackish above. Young specimens pale olive, spotted with black. Total length 5 M. or more.

Habitat: Java!. — Malay Peninsula; Burma; India; Ceylon.

The Mugger is a rare crocodile in the Indo-Australian region.

DISTRIBUTION  
OF SPECIES ON THE ISLANDS OF THE  
INDO-AUSTRALIAN ARCHIPELAGO.

**Simalur.**

Gymnodactylus marmoratus (Kuhl)  
Gonatodes kandianus (Kel.)  
Hemidactylus frenatus D.B.  
Hemiphyllodactylus typus Blkr.  
Gecko monarchus (D.B.)  
Pychozoon homalocephalum (Crev.)  
Draco volans L.  
Aphaniotis acutirostris Modigl.  
Aphaniotis fusca (Ptrs.)  
Calotes cristatellus (Kuhl)  
Varanus salvator (Laur.)  
Mabuia quinquecarinata Werner  
Mabuia multifasciata (Kuhl)  
Lygosoma olivaceum (Gray)  
Lygosoma atrocostatum (Less.)  
Lygosoma relictum Vincig.  
Dibamus novae-guineae D.B.  
Cyclemys amboinensis (Daud.)  
Crocodylus porosus Schn.

**Pulu Babi.**

Gonatodes kandianus (Kel.)  
Draco volans L.  
Mabuia multifasciata (Kuhl)

**Nias.**

Gymnodactylus marmoratus (Kuhl)  
Gonatodes kandianus (Kel.)  
Hemidactylus frenatus D.B.



*Hemidactylus garnoti* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Hemiphyllodactylus typus* Blkr.  
*Gecko monarchus* (D.B.)  
*Gecko stentor* (Cant.)  
*Ptychozoon homalocephalum* (Crev.)  
*Draco volans* L.  
*Aphaniotis acutirostris* Modigl.  
*Aphaniotis fusca* (Ptrs.)  
*Harpesaurus ensicauda* Wern.  
*Gonyocephalus grandis* (Gray)  
*Calotes cristatellus* (Kuhl)  
*Varanus salvator* (Laur.)  
*Mabuia rugifera* (Stol.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma anomalopus* Blgr.  
*Lygosoma olivaceum* (Gray)  
*Lygosoma relictum* Vincig.  
*Dibamus novae-guineae* D.B.  
*Cyclemys dhor* (Gray)  
*Cyclemys amboinensis* (Daud.)

#### **Pulu Nako.**

*Aphaniotis acutirostris* Modigl.  
*Calotes cristatellus* (Kuhl)

#### **Batu Islands.**

*Varanus dumerili* (Schleg.)  
*Geoemyda spengleri* (Gmel.)  
*Geoemyda spinosa* (Gray)

#### **Mentawai Islands.**

*Gonatodes kandianus* (Kel.)  
*Hemidactylus frenatus* D.B.  
*Gecko monarchus* (D.B.)  
*Ptychozoon homalocephalum* (Crev.)  
*Draco volans* L.  
*Draco haematopogon* Gray  
*Aphaniotis acutirostris* Modigl.  
*Gonyocephalus chamaeleontinus* (Laur.)  
*Gonyocephalus grandis* (Gray)  
*Calotes cristatellus* (Kuhl)  
*Mabuia rugifera* (Stol.)  
*Mabuia rudis* Blgr.

*Lygosoma modiglianii* Blgr.  
*Lygosoma vittigerum* Blgr.  
*Lygosoma relictum* Vincig.  
*Cyclemys dhor* (Gray)

#### Engano.

*Gymnodactylus marmoratus* (Kuhl)  
*Gonatodes kandianus* (Kel.)  
*Gehyra mutilata* (Wieg.)  
*Lepidodactylus ceylonensis* Blgr.  
*Ptychozoon homalocephalum* (Crev.)  
*Draco modiglianii* Vincig.  
*Varanus salvator* (Laur.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma relictum* Vincig.  
*Cyclemys amboinensis* (Daud.)

#### Sumatra.

*Gymnodactylus lateralis* Wern.  
*Gymnodactylus marmoratus* (Kuhl)  
*Gymnodactylus consobrinus* Ptrs.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus garnoti* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
 ? *Gehyra oceanica* (Less.)  
*Hemiphyllodactylus typus* Blkr.  
*Lepidodactylus ceylonensis* Blgr.  
*Gecko monarchus* (D.B.)  
*Gecko verticillatus* Laur.  
*Gecko stentor* (Cant.)  
*Ptychozoon homalocephalum* (Crev.)  
*Draco volans* L.  
*Draco cornutus* Gthr.  
*Draco fimbriatus* Kuhl  
*Draco maximus* Blgr.  
*Draco quinquefasciatus* Gray  
*Draco formosus* Blgr.  
*Draco haematopogon* Gray  
*Draco melanopogon* Blgr.  
*Draco intermedius* Werner  
*Aphaniotis acutirostris* Modigl.  
*Aphaniotis fusca* (Ptrs.)  
*Cophotis sumatrana* Hubr.  
*Phoxophrys tuberculata* Hubr.

*Harpesaurus beccarii* Doria  
*Gonyocephalus chamaeleontinus* (Laur.)  
*Gonyocephalus sumatranus* (Schleg.)  
*Gonyocephalus liogaster* (Gthr.)  
*Gonyocephalus beyschlagi* Bttgr.  
*Gonyocephalus borneensis* (Schleg.)  
*Gonyocephalus megalepis* (Blkr.)  
*Gonyocephalus grandis* (Gray)  
*Lophocalotes ludekingi* (Blkr.)  
*Dendragama boulengeri* Doria  
*Calotes cristatellus* (Kuhl)  
*Calotes tympanistriga* (Gray)  
*Calotes versicolor* (Daud.)  
*Acanthosaura armata* (Gray)  
*Liolepis belliana* (Gray)  
*Varanus dumerili* (Schleg.)  
*Varanus rudicollis* (Gray)  
*Varanus salvator* (Laur.)  
 ? *Varanus indicus* (Daud.)  
*Tachydromus sexlineatus* Daud.  
 ? *Tiliqua gigas* (Schn.)  
*Mabuia quinquecarinata* Werner  
*Mabuia rudis* Blgr.  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma malayanum* Doria  
*Lygosoma sanctum* D.B.  
*Lygosoma anomalopus* Blgr.  
*Lygosoma olivaceum* (Gray)  
*Lygosoma temmincki* D.B.  
*Lygosoma chalcides* (L.)  
*Lygosoma sumatrense* (Blkr.)  
 ? *Lygosoma noctua* (Less.)  
*Lygosoma bampfyldei* Bartl.  
*Lygosoma opisthorhodum* Werner  
*Dibamus novae-guineae* D.B.  
*Orlitia borneensis* Gray  
*Batagur baska* (Gray)  
*Bellia crassicollis* (Gray)  
*Geoemyda spengleri* (Gmel.)  
*Geoemyda spinosa* (Gray)  
*Cyclemys dhor* (Gray)  
*Cyclemys amboinensis* (Daud.)  
*Notochelys platynota* (Gray)  
*Testudo emys* Schleg. & Müll.  
*Chelonia mydas* (L.)

*Chelonia imbricata* (L.)  
*Dermochelys coriacea* (L.)  
*Dogania subplana* (Geoffr.)  
*Trionyx phayrei* Theob.  
*Trionyx cartilagineus* (Bodd.)  
*Pelochelys cantori* Gray  
*Tomistoma schlegeli* (S. Müll.)  
*Crocodylus porosus* Schn.

#### Riou.

*Hemidactylus platyurus* (Schn.)  
*Lepidodactylus lugubris* (D.B.)  
*Calotes cristatellus* (Kuhl)  
*Mabuia multifasciata* (Kuhl)  
*Trionyx cartilagineus* (Bodd.)  
*Crocodylus porosus* Schn.

#### Singkep.

*Gymnodactylus consobrinus* Ptrs.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Draco quinquefasciatus* Gray  
*Aphanotis fusca* (Ptrs.)  
*Calotes jubatus* (D.B.)  
*Lygosoma olivaceum* (Gray)  
*Lygosoma atrocostatum* (Less.)  
*Dogania subplana* (Geoffr.)

#### Banka.

*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Gecko verticillatus* Laur.  
*Draco volans* L.  
*Gonyocephalus chamaeleontinus* (Laur.)  
*Liolepis belliana* (Gray)  
*Varanus dumerili* Schleg.  
*Tachydromus sexlineatus* Daud.  
*Mabuia multifasciata* (Kuhl)  
*Geoemyda spinosa* (Gray)  
*Cyclemys dhor* (Gray)  
*Cyclemys amboinensis* (Daud.)

#### Biliton.

*Hemidactylus platyurus* (Schn.)

Gecko verticillatus Laur.  
 Draco volans L.  
 Varanus dumerili (Schleg.)  
 Chelonia mydas (L.)

#### Natuna Islands.

Gonatodes kendalli (Gray)  
 Draco volans L.  
 Draco fimbriatus Kuhl  
 Draco maximus Blgr.  
 Draco melanopogon Blgr.  
 Aphanotis fusca (Ptrs.)  
 Japalura nigrilabris (Ptrs.)  
 Gonyocephalus chamaeleontinus (Laur.)  
 Gonyocephalus herveyi Blgr.  
 Calotes cristatellus (Kuhl)  
 Tachydromus sexlineatus Daud.  
 Mabuia multifasciata (Kuhl)  
 Lygosoma olivaceum (Gray)  
 Geoemyda spinosa (Gray)  
 Cyclemys dhor (Gray)  
 Cyclemys amboinensis (Daud.)  
 Chelonia imbricata (L.)  
 Dogania subplana (Geoffr.)

#### Borneo.

Gymnodactylus marmoratus (Kuhl)  
 Gymnodactylus baluensis Mocq.  
 Gymnodactylus consobrinus Ptrs.  
 Gonatodes affinis (Stol.)  
 Gonatodes kendalli (Gray)  
 Aeluroscalabotes felinus (Gthr.)  
 Aeluroscalabotes dorsalis (Ptrs.)  
 Hemidactylus frenatus D.B.  
 Hemidactylus karenorum (Theob.)  
 Hemidactylus nigriventris Lidth  
 Hemidactylus brooki Gray  
 Hemidactylus garnoti D.B.  
 Hemidactylus platyurus (Schn.)  
 Mimetozone craspedotus (Mocq.)  
 Gehyra beebei Annand.  
 Gehyra mutilata (Wiegman)  
 Hemiphyllodactylus typus Blkr.  
 Lepidodactylus ceylonensis Blgr.  
 Lepidodactylus lugubris (D.B.)

Gecko monarchus (D.B.)  
 Gecko rhacophorus Blgr.  
 Gecko verticillatus Laur.  
 Gecko stentor (Cant.)  
 Ptychozoon homalocephalum (Crev.)  
 Ptychozoon horsfieldi (Gray)  
 Draco volans L.  
 Draco cornutus Gthr.  
 Draco gracilis Barbour  
 Draco punctatus Blgr.  
 Draco lineatus Daud.  
 Draco fimbriatus Kuhl  
 Draco cristatellus Gthr.  
 Draco maximus Blgr.  
 Draco quinquefasciatus Gray  
 Draco formosus Blgr.  
 Draco haematopogon Gray  
 Draco melanopogon Blgr.  
 Draco taeniopterus Gthr.  
 Draco obscurus Blgr.  
 Draco microlepis Blgr.  
 ? Draco rostratus Gthr.  
 ? Draco affinis Bartl.  
 Aphaniotis acutirostris Modigl.  
 Aphaniotis fusca (Ptrs.)  
 Japalura ornata Lidth  
 Japalura nigrilabris (Ptrs.)  
 Gonyocephalus doriae Ptrs.  
 Gonyocephalus liogaster (Gthr.)  
 Gonyocephalus borneensis (Schleg.)  
 Gonyocephalus miotyimpanum (Gthr.)  
 Gonyocephalus megalepis (Blkr.)  
 Gonyocephalus grandis (Gray)  
 Calotes cristatellus (Kuhl)  
 Lanthanotus borneensis Steind.  
 Ophisaurus büttikoferi Lidth  
 Varanus heteropholis Blgr.  
 Varanus dumerili (Schleg.)  
 Varanus rudicollis (Gray)  
 Varanus salvator (Laur.)  
 Tachydromus sexlineatus Daud.  
 ? Mabuia quinquecarinata Werner  
 Mabuia rugifera (Stol.)  
 Mabuia multicarinata (Gray)  
 Mabuia rudis Blgr.

*Mabuia multifasciata* (Kuhl)  
*Lygosoma büttikoferi* Lidth  
*Lygosoma shelfordi* Blgr.  
*Lygosoma tenuiculum* Mocq.  
*Lygosoma variegatum* Ptrs.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma vyneri* Shelford  
*Lygosoma nieuwenhuisi* Lidth  
*Lygosoma olivaceum* (Gray)  
*Lygosoma vittatum* (Edel.)  
*Lygosoma alfredi* Blgr.  
*Lygosoma hallieri* Lidth  
*Lygosoma vittigerum* Blgr.  
*Lygosoma nitens* Ptrs.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma atrocostatum* (Less.)  
 ? *Lygosoma nigrum* Homb. & Jacq.  
*Lygosoma parietale* (Ptrs.)  
*Lygosoma bampfyldei* Bartl.  
*Lygosoma bowringi* (Gthr.)  
*Lygosoma quadrivittatum* Ptrs.  
*Tropidophorus beccarii* (Ptrs.)  
*Tropidophorus mocquardi* Blgr.  
*Tropidophorus brookei* (Gray)  
*Tropidophorus micropus* Lidth  
*Tropidophorus iniquus* Lidth  
*Dibamus novae-guineae* D.B.  
*Callagur borneensis* (Schleg. & Müll.)  
*Orlitia borneensis* Gray  
*Bellia crassicollis* (Gray)  
*Geoemyda spengleri* (Gmel.)  
*Geoemyda spinosa* (Gray)  
*Cyclemys dhor* (Gray)  
*Cyclemys amboinensis* (Daud.)  
*Notochelys platynota* (Gray)  
*Testudo emys* Schleg. & Müll.  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)  
*Caretta caretta* (L.)  
*Dogania subplana* (Geoffr.)  
*Trionyx hurum* Gray  
*Trionyx phayrei* Theob.  
*Trionyx cartilagineus* (Bodd.)  
*Pelochelys cantori* Gray  
*Tomistoma schlegeli* (S. Müll.)

*Crocodylus porosus* Schn.

**Sibutu Island.**

*Calotes cristatellus* (Kuhl)

**Pulu Miang.**

*Lygosoma miangense* Wern.

**Java.**

*Gymnodactylus marmoratus* (Kuhl)

*Gymnodactylus fumosus* F. Müll.

*Hemidactylus frenatus* D.B.

*Hemidactylus garnoti* D.B.

*Hemidactylus platyurus* (Schn.)

*Gehyra mutilata* (Wieg.)

*Hemiphyllodactylus typus* Blkr.

*Lepidodactylus ceylonensis* Blgr.

? *Gecko vittatus* Houtt.

*Gecko monarchus* (D.B.)

*Gecko verticillatus* Laur.

*Gecko stentor* (Cant.)

*Ptychozoon homalocephalum* (Crev.)

*Draco volans* L.

*Draco lineatus* Daud.

*Draco fimbriatus* Kuhl

*Draco cryptotis* Despax

*Draco haematopogon* Gray

*Harpesaurus tricinctus* (A. Dum.)

*Gonyocephalus kuhli* (Schleg.)

*Gonyocephalus chamaeleontinus* (Laur.)

*Calotes cristatellus* (Kuhl)

*Calotes jubatus* (D.B.)

*Calotes tympanistriga* (Gray)

*Varanus dumerili* (Schleg.)

*Varanus nebulosus* (Gray)

*Varanus salvator* (Laur.)

*Tachydromus sexlineatus* Daud.

*Tiliqua gigas* (Schn.)

? *Mabuia quinquecarinata* Werner

*Mabuia rugifera* (Stol.)

*Mabuia rudis* Blgr.

*Mabuia multifasciata* (Kuhl)

*Lygosoma sanctum* D.B.

*Lygosoma smaragdinum* (Less.)

*Lygosoma olivaceum* (Gray)



*Lygosoma temmincki* D.B.  
*Lygosoma chalcides* (L.)  
 ? *Lygosoma noctua* (Less.)  
*Lygosoma cyanurum* (Less.)  
*Lygosoma atrocostatum* (Less.)  
*Lygosoma bowringi* (Gthr.)  
*Ablepharus boutoni* (Desj.)  
*Damonia subtrijuga* (Schleg. & Müll.)  
*Bellia crassicollis* (Gray)  
*Cyclemys dhor* (Gray)  
*Cyclemys amboinensis* (Daud.)  
 ? *Testudo emys* Schleg. & Müll.  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)  
*Caretta caretta* (L.)  
*Dogania subplana* (Geoffr.)  
*Trionyx phayrei* Theob.  
*Trionyx cartilagineus* (Bodd.)  
*Pelochelys cantori* Gray  
*Crocodylus porosus* Schn.  
*Crocodylus siamensis* Schn.  
*Crocodylus palustris* Less.

#### **Madura.**

*Gecko verticillatus* Laur.  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)

#### **Bali.**

*Hemidactylus frenatus* D.B.  
*Draco volans* L.  
*Calotes jubatus* (D.B.)  
*Varanus salvator* (Laur.)  
*Ablepharus boutoni* (Desj.)

#### **Lombok.**

*Gymnodactylus marmoratus* (Kuhl)  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gecko verticillatus* Laur.  
*Draco volans* L.  
*Draco reticulatus* Gthr.  
*Varanus salvator* (Laur.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma smaragdinum* (Less.)

Ablepharus boutoni (Desj.)  
 Dibamus novae-guineae D.B.

**Paternoster Islands.**

Ablepharus boutoni (Desj.)

**Sumbawa.**

Hemidactylus frenatus D.B.  
 Varanus salvator (Laur.)  
 Mabuia multifasciata Kuhl

**Sumba.**

Hemidactylus frenatus D.B.  
 Hemidactylus platyurus (Schn.)  
 Gehyra mutilata (Wieg.)  
 Gecko verticillatus Laur.  
 Draco reticulatus Gthr.  
 Varanus salvator (Laur.)  
 Lygosoma emigrans Lidth  
 Lygosoma smaragdinum (Less.)  
 Ablepharus boutoni (Desj.)  
 Chelonia imbricata (L.)

**Savu.**

Hemidactylus frenatus D.B.  
 Hemidactylus platyurus (Schn.)  
 Gecko verticillatus Laur.  
 Varanus timorensis (Gray)  
 Lygosoma smaragdinum (Less.)

**Rotti.**

Hemidactylus frenatus D.B.  
 Hemidactylus brooki Gray  
 Gehyra mutilata (Wieg.)  
 Gecko verticillatus Laur.  
 Draco timorensis Kuhl  
 Varanus timorensis (Gray)  
 Lygosoma smaragdinum (Less.)  
 Chelodina novae-guineae Blgr.

**Samao Island.**

Gecko verticillatus Laur.  
 Draco timorensis Kuhl  
 Varanus timorensis (Gray)  
 Mabuia multifasciata (Kuhl)

*Lygosoma florense* M. Web.  
*Lygosoma emigrans* Lidth  
*Lygosoma temmincki* D.B.  
*Lygosoma cyanurum* (Less.)  
*Ablepharus boutoni* (Desj.)

#### Timor.

*Gonatodes timorensis* (D.B.)  
*Hemidactylus frenatus* D.B.  
*Gehyra mutilata* (Wieg.)  
*Gecko vittatus* Houtt.  
*Gecko verticillatus* Laur.  
*Draco volans* L.  
*Draco timorensis* Kuhl  
*Draco walkeri* Blgr.  
*Varanus timorensis* (Gray)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma florense* M. Web.  
*Lygosoma variegatum* Ptrs.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma cyanurum* (Less.)  
*Ablepharus boutoni* (Desj.)  
*Trionyx sinensis* Wieg.  
*Crocodylus porosus* Schn.

#### Komodo Island.

*Varanus komodoensis* Ouwens

#### Pulu Sukur.

*Lygosoma emigrans* Lidth  
*Lygosoma fuscum* (D.B.)

#### Flores.

*Gymnodactylus d'armandvillei* M. Web.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus brooki* Gray  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Gecko verticillatus* Laur.  
*Draco volans* L.  
*Draco reticulatus* Gthr.  
*Draco timorensis* Kuhl  
*Varanus salvator* (Laur.)  
*Varanus komodoensis* Ouwens  
*Mabuia multifasciata* (Kuhl)

*Lygosoma florense* M. Web.  
*Lygosoma striolatum* M. Web.  
*Lygosoma smaragdinum* (Less.)  
*Ablepharus boutoni* (Desj.)  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)

**Solor Island.**

*Caretta caretta* (L.)  
*Dermochelys coriacea* (L.)

**Gr. Bastard.**

*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Lygosoma florense* M. Web.  
*Lygosoma emigrans* Lidth  
*Lygosoma cyanurum* (Less.)

**Lomblem.**

*Hemidactylus frenatus* D.B.  
*Ablepharus boutoni* (Desj.)

**Adonara.**

*Hemidactylus frenatus* D.B.  
*Gecko verticillatus* Laur.  
*Lygosoma florense* M. Web.

**Alor (Ombai).**

*Hemidactylus frenatus* D.B.  
*Hemidactylus brooki* Gray  
*Gehyra mutilata* (Wieg.)  
*Gecko verticillatus* Laur.  
*Draco timorensis* Kuhl  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma florense* M. Web.  
*Lygosoma smaragdinum* (Less.)  
*Ablepharus boutoni* (Desj.)

**Wetar.**

*Hemidactylus frenatus* D.B.  
*Draco timorensis* Kuhl  
*Varanus salvator* (Laur.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma florense* M. Web.  
*Lygosoma smaragdinum* (Less.)

**Damma.**

*Gecko verticillatus* Laur.  
*Calotes cristatellus* (Kuhl)  
*Physignathus temporalis* (Gthr.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma florense* M. Web.  
*Lygosoma striolatum* M. Web.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Ablepharus boutoni* (Desj.)

**Babber.**

*Physignathus temporalis* (Gthr.)

**Timor Laut.**

*Gehyra mutilata* (Wiegman.)  
*Gecko verticillatus* Laur.  
*Calotes cristatellus* (Kuhl)  
*Physignathus temporalis* (Gthr.)  
*Physignathus maculilabris* Blgr.  
*Varanus indicus* (Daud.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma cyanurum* (Less.)  
*Lygosoma rufescens* (Shaw)  
*Ablepharus boutoni* (Desj.)

**Djampea Island.**

*Gecko verticillatus* Laur.

**Kalao Island.**

*Gymnodactylus d'armandvillei* M. Web.  
*Varanus salvator* (Laur.)

**Saleyser.**

*Hemidactylus frenatus* D.B.  
*Varanus togianus* (Ptrs.)  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma chalcides* (L.)

**Buton.**

*Hemidactylus frenatus* D.B.  
*Lophura amboinensis* (Schloss.)  
*Lygosoma tropidonotus* Blgr.

*Lygosoma temmincki* D.B.  
*Lygosoma bowringi* (Gthr.)

### Celebes.

*Gymnodactylus jellesmae* Blgr.  
*Gymnodactylus marmoratus* (Kuhl)  
*Gymnodactylus fumosus* F. Müll.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Lepidodactylus lugubris* (D.B.)  
*Gecko monarchus* (D.B.)  
*Gecko verticillatus* Laur.  
*Draco volans* L.  
*Draco reticulatus* Gthr.  
*Draco lineatus* Daud.  
*Draco beccarii* P.D.  
*Draco spilonotus* Gthr.  
*Calotes cristatellus* (Kuhl)  
*Calotes celebensis* (Gray)  
 ? *Calotes jubatus* (D.B.)  
*Lophura amboinensis* (Schloss.)  
*Varanus salvator* (Laur.)  
*Varanus togianus* (Ptrs.)  
*Varanus indicus* (Daud.)  
*Mabuia rudis* Blgr.  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma celebense* F. Müll.  
*Lygosoma melanopogon* D.B.  
*Lygosoma nigrilabre* Gthr.  
*Lygosoma tropidonotus* Blgr.  
*Lygosoma variegatum* Ptrs.  
*Lygosoma sarasinorum* Blgr.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma temmincki* D.B.  
*Lygosoma parvum* Blgr.  
*Lygosoma textum* F. Müll.  
*Lygosoma inconspicuum* F. Müll.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma atrocostatum* (Less.)  
*Lygosoma bowringi* (Gthr.)  
*Lygosoma infralineolatum* (Gthr.)  
*Lygosoma quadrivittatum* Ptrs.  
*Tropidophorus grayi* Gthr.  
*Dibamus novae-guineae* D.B.

*Cyclemys amboinensis* (Daud.)  
*Testudo forsteni* Schleg. & Müll.  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)  
*Caretta caretta* (L.)  
 ? *Emyda granosa* (Schoepff)  
*Crocodilus porosus* Schn.

#### **Togian Islands.**

*Lophura amboinensis* (Schloss.)  
*Varanus togianus* (Ptrs.)  
*Lygosoma cyanurum* (Less.)

#### **Sanghir Islands.**

*Draco reticulatus* Gthr.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma infralineolatum* (Gthr.)

#### **Salibabu Islands.**

*Calotes jubatus* (D.B.)  
*Varanus indicus* (Daud.)  
*Lygosoma cyanurum* (Less.)  
*Lygosoma rufescens* (Shaw)

#### **Karakelang Islands.**

*Calotes jubatus* (D.B.)  
*Mabuia multicarinata* (Gray)  
*Lygosoma cyanurum* (Less.)

#### **Kabaëna.**

*Gymnodactylus jellesmae* Blgr.

#### **Buru.**

*Gecko vittatus* Houtt.  
*Draco lineatus* Daud.  
*Calotes cristatellus* (Kuhl!)  
*Varanus indicus* (Daud.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma cyanurum* (Less.)  
*Lygosoma baudini* (D.B.)  
*Ablepharus boutoni* (Desj.)  
*Cyclemys amboinensis* (Daud.)

#### **Ambon.**

*Hemidactylus frenatus* D.B.

Hemidactylus garnoti D.B. <sup>1)</sup>  
 Gehyra mutilata (Wiegman.)  
 Lepidodactylus lugubris (D.B.)  
 Gecko vittatus Houtt.  
 Gecko monarchus (D.B.)  
 Gecko verticillatus L aur. <sup>1)</sup>  
 Draco lineatus Daud.  
 Calotes cristatellus (Kuhl)  
 Lophura amboinensis (Schloss.)  
 Varanus indicus (Daud.)  
 Tiliqua gigas (Schn.)  
 Mabuia multifasciata (Kuhl)  
 Lygosoma smaragdinum (Less.)  
 Lygosoma fuscum (D.B.)  
 Lygosoma novae-guineae Meyer  
 Lygosoma cyanogaster (Less.)  
 Lygosoma kuekenthali Boettger  
 Lygosoma cyanurum (Less.)  
 Lygosoma atrocostatum (Less.)  
 Lygosoma rufescens (Shaw)  
 Ablepharus boutoni (Desj.)  
 Cyclernys amboinensis (Daud.)  
 Chelonia mydas (L.)  
 Chelonia imbricata (L.)  
 Caretta caretta (L.)  
 Crocodilus porosus Schn.

### Saparua.

Mabuia multifasciata (Kuhl)  
 Lygosoma fuscum (D.B.)

### Ceram.

Gymnodactylus marmoratus (Kuhl)  
 Hemidactylus frenatus D.B.  
 Gecko vittatus Houtt.  
 Gecko monarchus (D.B.)  
 Draco lineatus Daud.  
 Calotes cristatellus (Kuhl)  
 Lophura amboinensis (Schloss.)  
 Varanus indicus (Daud.)  
 Tiliqua gigas (Schn.)  
 Mabuia multifasciata (Kuhl)

1) Not mentioned from Ambon in the systematical part.



*Lygosoma undulatum* P.D.  
*Lygosoma smaragdinum* (Less.)  
 ? *Lygosoma vittatum* (Edel.)  
*Lygosoma mülleri* (Schleg.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma cyanurum* (Less.)  
*Lygosoma rufescens* (Shaw)  
*Ablepharus boutoni* (Desj.)  
*Dibamus novae-guineae* D.B.  
*Cyclemys amboinensis* (Daud.)

#### **Uliassers.**

*Calotes cristatellus* (Kuhl)  
*Mabuia multifasciata* (Kuhl)

#### **Banda.**

*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)

#### **Goram.**

*Gehyra mutilata* (Wiegm.)  
*Gecko vittatus* Houtt.  
*Calotes cristatellus* (Kuhl)  
*Varanus indicus* (Daud.)  
*Lygosoma melanopogon* (D.B.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma cyanurum* (Less.)

#### **Nusa Laut.**

*Gecko vittatus* Houtt.  
*Lygosoma cyanurum* (Less.)

#### **Pulu Kelang.**

*Gecko vittatus* Houtt.  
*Lygosoma fuscum* (D.B.)

#### **Gebe.**

*Varanus indicus* (Daud.)

#### **Obi.**

*Hemidactylus frenatus* D.B.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma sorex* Boettger  
*Chelonia mydas* (L.)

**Batjan.**

*Hemidactylus frenatus* D.B.  
*Gehyra mutilata* (Wieg.)  
*Calotes cristatellus* (Kuhl)  
*Lophura amboinensis* (Schloss.)  
*Varanus salvator* (Laur.)  
*Varanus indicus* (Daud.)  
 ? *Varanus timorensis* (Gray)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma consobrinum* P.D.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma sores* Boettger  
*Lygosoma kuekenthali* Boettger  
*Cyclemys amboinensis* (Daud.)  
*Crocodylus porosus* Schn.

**Ternate.**

*Hemidactylus frenatus* D.B.  
*Gehyra mutilata* (Wieg.)  
*Gehyra oceanica* Less.  
*Gehyra marginata* Blgr.  
*Lepidodactylus lugubris* (D.B.)  
*Gecko vittatus* Houtt.  
*Calotes cristatellus* (Kuhl)  
*Lophura amboinensis* (Schloss.)  
*Lophura weberi* (Barbour)  
*Varanus indicus* (Daud.)  
*Tiliqua gigas* (Schn.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma brevipes* Boettger  
 ? *Lygosoma mülleri* (Schleg.)  
*Lygosoma noctua* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma cyanurum* (Less.)  
*Lygosoma baudini* (D.B.)  
*Lygosoma atrocostatum* (Less.)  
 ? *Lygosoma mentovarium* Boettger  
*Lygosoma rufescens* (Shaw)  
*Dibamus novae-guineae* D.B.  
*Chelonia imbricata* (L.)  
*Crocodylus porosus* Schn.

**Halmahera.**

*Gymnodactylus fumosus* F. Müll.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Gehyra oceanica* Less.  
*Gehyra marginata* Blgr.  
*Lepidodactylus lugubris* (D.B.)  
*Gecko vittatus* Houtt.  
*Calotes cristatellus* (Kuhl)  
*Lophura amboinensis* (Schloss.)  
*Lophura weberi* (Barbour)  
*Varanus salvator* (Laur.)  
*Varanus indicus* (Daud.)  
*Tiliqua gigas* (Schn.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma consobrinum* P.D.  
*Lygosoma variegatum* Ptrs.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma brevipes* Boettger  
*Lygosoma noctua* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma cyanogaster* (Less.)  
*Lygosoma sorex* Boettger  
*Lygosoma kuekenthali* Boettger  
*Lygosoma cyanurum* (Less.)  
*Lygosoma atrocostatum* (Less.)  
*Lygosoma mentovarium* Boettger  
*Dibamus novae-guineae* D.B.  
*Cyclemys amboinensis* (Daud.)  
*Testudo forsteni* Schleg. & Müll.  
*Crocodylus porosus* Schn.

**Morotai.**

*Gymnodactylus marmoratus* (Kuhl)  
*Gehyra marginata* Blgr.  
*Gecko vittatus* Houtt.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma cyanurum* (Less.)

**Rawak Island.**

*Varanus indicus* (Daud.)  
*Lygosoma fuscum* (D.B.)

**Waigeu.**

*Hemidactylus frenatus* D.B.  
*Gehyra mutilata* (Wieg.)  
*Gecko vittatus* Houtt.  
*Lophura amboinensis* (Schloss.)  
*Varanus kalabeck* (Less.)  
*Varanus indicus* (Daud.)  
*Mabuia multifasciata* (Kuhl)  
*Lygosoma elegantulum* P.D.  
*Lygosoma variegatum* Ptrs.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma cyanogaster* (Less.)  
*Lygosoma iridescens* Blgr.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma mivarti* Blgr.  
*Lygosoma baudini* (D.B.)  
*Lygosoma atrocostatum* (Less.)  
*Ablepharus boutoni* (Desj.)  
*Dibamus novae-guineae* D.B.  
*Emydura novae-guineae* (Meyer)

**Batanta.**

*Gonyocephalus dilophus* (D.B.)

**Salawatti.**

*Hemidactylus frenatus* D.B.  
*Lygosoma melanopogon* D.B.  
*Lygosoma jobiense* Meyer  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma cyanurum* (Less.)

**Misol.**

*Lepidodactylus lugubris* (D.B.)  
*Gecko vittatus* Houtt.  
*Gecko monarchus* (D.B.)  
*Draco lineatus* Daud.  
*Calotes cristatellus* (Kuhl)  
*Tiliqua gigas* (Schn.)  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma cyanurum* (Less.)

**Kei Islands.**

*Gymnodactylus marmoratus* (Kuhl)  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Gehyra oceanica* (Less.)  
*Gehyra marginata* Blgr.  
*Lepidodactylus lugubris* (D.B.)  
*Gecko vittatus* Houtt.  
*Gecko monarchus* (D.B.)  
*Draco lineatus* Daud.  
*Draco ochropterus* Wern.  
*Gonyocephalus dilophus* (D.B.)  
*Physignathus temporalis* (Gthr.)  
*Varanus indicus* (Daud.)  
*Tiliqua gigas* (Schn.)  
*Lygosoma undulatum* P.D.  
*Lygosoma kühnei* Roux  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma mülleri* (Schleg.)  
*Lygosoma beccarii* P.D.  
*Lygosoma fuscum* (D.B.)  
*Lygosoma novae-guineae* Meyer  
*Lygosoma cyanogaster* (Less.)  
*Lygosoma cyanurum* (Less.)  
*Lygosoma atrocostatum* (Less.)  
*Ablepharus boutoni* (Desj.)  
*Chelonia imbricata* (L.)

**Aru Islands.**

*Gymnodactylus marmoratus* (Kuhl)  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra mutilata* (Wieg.)  
*Gecko vittatus* Houtt.  
*Gecko monarchus* (D.B.)  
*Gecko verticillatus* Laur.  
*Lialis burtoni* Gray  
*Gonyocephalus dilophus* (D.B.)  
*Gonyocephalus binotatus* Meyer  
*Gonyocephalus modestus* Meyer  
*Varanus indicus* (Daud.)  
*Varanus kordensis* (Meyer)  
*Tiliqua gigas* (Schn.)

*Mabuia multifasciata* (Kuhl)  
*Lygosoma rufum* Blgr.  
*Lygosoma aruanum* Roux  
*Lygosoma melanopogon* D.B.  
*Lygosoma jobiense* Meyer  
*Lygosoma variegatum* Ptrs.  
*Lygosoma mülleri* (Schleg.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma cyanogaster* (Less.)  
*Lygosoma iridescens* Blgr.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma baudini* (D.B.)  
*Lygosoma atrocostatum* (Less.)  
*Lygosoma rufescens* (Shaw)  
*Ablepharus boutoni* (Desj.)  
*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)  
*Caretta caretta* (L.)  
*Crocodilus porosus* Schn.

#### New Guinea.

*Gymnodactylus pelagicus* (Gir.)  
*Gymnodactylus sermowaiensis* de Rooy  
*Gymnodactylus marmoratus* (Kuhl)  
*Gymnodactylus louisianensis* de Vis  
*Gymnodactylus loriae* Blgr.  
*Gymnodactylus mimikanus* Blgr.  
*Hemidactylus frenatus* D.B.  
*Hemidactylus platyurus* (Schn.)  
*Gehyra interstitialis* Oudem.  
*Gehyra mutilata* (Wieg.)  
*Gehyra baliola* (A. Dum.)  
*Gehyra variegata* (D.B.)  
*Gehyra oceanica* (Less.)  
*Lepidodactylus lugubris* (D.B.)  
*Lepidodactylus guppyi* Blgr.  
*Lepidodactylus woodfordi* Blgr.  
*Gecko vittatus* Houtt.  
*Gecko pumilus* Blgr.  
*Lialis burtoni* Gray  
*Lialis jicari* Blgr.  
*Gonyocephalus dilophus* (D.B.)  
*Gonyocephalus binotatus* Meyer  
*Gonyocephalus nigrigularis* Meyer  
*Gonyocephalus godeffroyi* (Ptrs.)

*Gonyocephalus papuensis* (Macl.)  
*Gonyocephalus modestus* Meyer  
*Gonyocephalus geelvinkianus* P.D.  
*Gonyocephalus auritus* Meyer  
*Gonyocephalus bruyni* P.D.  
*Chlamydosaurus kingi* Gray  
*Lophura amboinensis* (Schloss.)  
*Physignathus temporalis* (Gthr.)  
*Physignathus lesueuri* Gray  
*Diporophora bilineata* Gray  
? *Diporophora australis* (Steind.)  
*Varanus salvadorii* (P.D.)  
*Varanus kalabeck* (Less.)  
*Varanus indicus* (Daud.)  
*Varanus gouldi* (Gray)  
*Varanus prasinus* (Schleg.)  
*Varanus kordensis* (Meyer)  
*Tiliqua gigas* (Schn.)  
*Mabuia multifasciata* (Kuhl)  
? *Lygosoma cumingi* (Gray)  
*Lygosoma granulatum* Blgr.  
*Lygosoma annectens* Blgr.  
*Lygosoma mimikanum* Blgr.  
*Lygosoma lesueuri* D.B.  
*Lygosoma dorsale* Blgr.  
*Lygosoma maindroni* Sauv.  
*Lygosoma emigrans* Lidth  
*Lygosoma minutum* Meyer  
*Lygosoma nototaenia* Blgr.  
*Lygosoma elegantulum* P.D.  
*Lygosoma nigrolineatum* Blgr.  
*Lygosoma schultzei* Vogt  
*Lygosoma undulatum* P.D.  
*Lygosoma moszkowskii* Vogt  
*Lygosoma aignanum* Blgr.  
*Lygosoma melanopogon* D.B.  
*Lygosoma simum* Sauv.  
*Lygosoma jobiense* Meyer  
*Lygosoma variegatum* Ptrs.  
*Lygosoma smaragdinum* (Less.)  
*Lygosoma forbesi* Blgr.  
*Lygosoma crassicauda* A. Dum.  
*Lygosoma unilineatum* de Rooy  
*Lygosoma nigriventre* de Rooy  
*Lygosoma loriae* Blgr.

*Lygosoma wollastoni* Blgr.  
*Lygosoma pratti* Blgr.  
*Lygosoma neuhaussi* Vogt  
*Lygosoma oligolepis* Blgr.  
*Lygosoma solomonis* Blgr.  
*Lygosoma longicaudatum* de Rooy  
*Lygosoma mülieri* (Schleg.)  
*Lygosoma jeudei* Blgr.  
*Lygosoma tornieri* Vogt  
*Lygosoma schoedei* Vogt  
*Lygosoma virens* (Ptrs.)  
*Lygosoma longiceps* Blgr.  
*Lygosoma noctua* (Less.)  
*Lygosoma elegans* Blgr.  
*Lygosoma semoni* Oudem.  
*Lygosoma miotis* Blgr.  
*Lygosoma pulchrum* Blgr.  
*Lygosoma subnitens* Boettger  
*Lygosoma stanleyanum* Blgr.  
*Lygosoma bicarinatum* (Macl.)  
*Lygosoma fuscum* (D.B.)  
*Lygosoma pullum* (Barbour)  
*Lygosoma nigrigulare* Blgr.  
*Lygosoma novae-guineae* Meyer  
*Lygosoma curtum* Blgr.  
*Lygosoma cyanogaster* (Less.)  
*Lygosoma cuneiceps* (de Vis)  
*Lygosoma klossi* Blgr.  
*Lygosoma iridescens* Blgr.  
*Lygosoma cyanurum* (Less.)  
*Lygosoma mivarti* Blgr.  
*Lygosoma méhelyi* Werner  
*Lygosoma callisticum* P.D.  
*Lygosoma baudini* (D.B.)  
*Lygosoma tropidolepis* Blgr.  
*Lygosoma pallidiceps* (de Vis)  
*Lygosoma atrocostatum* (Less.)  
*Lygosoma nigrum* Hombr. & Jacq.  
*Lygosoma albofasciolatum* (Gthr.)  
*Lygosoma rufescens* (Shaw)  
*Ablepharus boutoni* (Desj.)  
*Tribolonotus novae-guineae* (Schleg.)  
*Tribolonotus gracilis* de Rooy  
*Dibamus novae-guineae* D.B.  
*Devisia mythodes* D. Ogilby



*Chelonia mydas* (L.)  
*Chelonia imbricata* (L.)  
*Caretta caretta* (L.)  
*Dermochelys coriacea* (L.)  
*Chelodina novae-guineae* Blgr.  
*Chelodina siebenrocki* Wern.  
*Chelodina oblonga* Gray  
*Emydura macquarri* (Gray)  
*Emydura krefftii* (Gray)  
*Emydura albertisi* Blgr.  
*Emydura subglobosa* (Krefft)  
*Emydura branderhorsti* Ouwens  
*Emydura schultzei* Vogt  
*Emydura novae-guineae* (Meyer)  
*Carettochelys insculpta* Ramsay  
*Pelochelys cantori* Gray  
*Crocodylus porosus* Schn.



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## ADDENDA AND CORRIGENDA.

- p. 6. *G. fumosus*, read 42—52 pores.
- p. 14. *Gymnodactylus marmoratus* (Kuhl) add to the habitat Sumatra: Rawas in Palembang!.
- p. 30. *Hemidactylus frenatus* D. B. add to the habitat Sumatra: Rawas in Palembang!.
- p. 34. *Hemidactylus garnoti* D. B. add to the habitat: Ambon.
- p. 35. *Hemidactylus platyurus* (Schn.) add to the habitat Sumatra: Rawas in Palembang!.
- p. 42. *Gehyra mutilata* (Wieg.) add to the habitat Sumatra: Rawas in Palembang!.
- p. 57. *Gecko verticillatus* Laur. add to the habitat: Ambon.
- p. 90. *Aphaniotis acutirostris* Modigl., add to the habitat Sumatra: Sabang on Pulu Weh!.
- p. 119. *Dendragama fruhstorferi* Bttgr., read the description as follows:

Head pyramidal, with angular canthus rostralis; snout pointed, more than twice the diameter of the eye; tympanum as large as orbit or a little smaller. Head-scales unequal, smooth or feebly keeled; on the snout a median series of 2—4 keeled scales; supraorbital region with strongly keeled scales. A smooth supranasal; nostril in a lateral nasal, separated from the rostral, which is three times as broad as high. Spine at the supraciliary edge small; two longitudinal series of three large, keeled<sup>1)</sup> temporal scales. Eight to ten upper and lower labials, keeled; next to the latter a series of large keeled<sup>1)</sup> chin-shields. Gular sac small, covered with keeled scales. Body compressed; nuchal crest consisting of 6—9 small scales; dorsal crest with 21—26 still smaller scales. Dorsal scales large, feebly keeled, 48—50 across the middle of the body; lateral scales rhomboidal, unequal, smooth, larger

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1) In Boettger's description: smooth.

than dorsals and strongly keeled ventrals. Tail compressed, covered with keeled scales, two times and one third the length of head and body. Limbs covered with equal, keeled scales; digits bicarinate inferiorly; fourth finger longer than third; fourth toe much longer than third; hind limb, stretched forwards, reaches the tympanum.

Grey or green above, with bluish-grey and brown spots and blackish transverse or oblique lines; on the flanks 5—6 white scales in a longitudinal series. Sides of head and lips with dark brown spots; limbs and tail with black half-rings above. Lower parts greenish-white; tail white with a black network. Length of head and body 72 mm.; tail 168 mm.

Habitat: Java! (Volcano Tjisurupan).

- p. 122. *Calotes cristatellus* (Kuhl), add to the habitat Sumatra: Sabang on Pulu Weh!.
- p. 163. *Mabuia multifasciata* (Kuhl), add to the habitat Sumatra: Sabang on Pulu Weh!.
- p. 195. *Lygosoma anomalopus* Blgr., add to the description: Tail more than twice the length of head and body; add to the habitat: Medan in Deli!.
- p. 226. *Lygosoma chalcides* (L.) add to the habitat Sumatra: Rawas in Palembang!.
- p. 265. *Lygosoma opisthorhodum* Werner, add to the description: praefrontals small; eight supraciliaries, first and last largest; no nuchals; dorsal and lateral scales quinquecarinate.

Blackish-brown above; a light dorso-lateral stripe from the frontal to the flanks, passing on the upper eyelid; a broad blackish lateral band from the nostril through the eye to the flanks, where it is lost, anteriorly white-spotted. A narrow whitish line below the eye on the upper lip to the ear; edges of lips dark brown.

Add to the habitat: Medan in Deli!. The specimen, captured there, measures 57 + 84 mm.

- p. 327. *Dogania subplana* (Geoffr.) add to the habitat: Banka!.
- p. 344. Add to the list of Banka: *Dogania subplana* (Geoff.).





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