

# Amphibians and Reptiles from the Cameron Highlands, Malay Peninsula

By N. SMEDLEY, M. A.

(Plate II and 5 text-figures)

In defining the locality from which the present collections are derived, I can do no better than follow the example of the late H. C. Robinson (The Birds of the Malay Peninsula, Vol. II: The Birds of the Hill Stations, p. xvi), who quotes an official report as follows:—

“The area known as ‘Cameron’s Highlands’, from the explorer who first called attention to it in the early eighties, which will become, in time, the most important Hill Station in the Federated Malay States, is situated in Pahang, close to the Perak boundary, in lat.  $4^{\circ} 30' N.$ , and long  $101^{\circ} 24' E.$  The area of the Highlands proper is 9 square miles, but between that area and the Perak boundary there is a further area, capable of development, of 17 square miles. The altitude of this larger area varies from 3,750 to 5,500 ft., with peaks running up to nearly 7,000 ft.”

The material described in this paper is from two main sources; Prof. K. B. Williamson, in the course of entomological researches, has found an opportunity to collect a number of herpetological specimens, and a native collector from the Raffles Museum was stationed at Tanah Rata for a fortnight for the express purpose of making a systematic collection. In addition a few isolated specimens are included, noteworthy amongst them being the acquisition by Mr. N. C. E. Miller, of the Department of Agriculture, of the second example of *Lygosoma miodactylum*. The period of development of the Cameron Highlands area provides a favourable opportunity for collecting; clearing of thick jungle has brought to light much larger numbers of specimens than might have been the case had collecting taken place in an undisturbed area. The Raffles Museum is indebted to Prof. Williamson, who has presented his collections to augment the study series in that institution.

My most sincere thanks are due to Dr. Malcolm Smith for making comparisons with material in the British Museum, and for much generous assistance and advice which I have gratefully accepted.

A special interest attaches to collections from the Highlands. Hitherto many species have been recorded only from the mountains of the Peninsula, and even so as rare; this may be due to the fact that the peaks explored were isolated, whereas in the Highlands there is a considerable area of uninterrupted hill-country without deep intervening valleys. Undoubtedly it appears to be a favourable locality for the development of the reptilian fauna; not only

are many species previously regarded as rare relatively abundant, but the maximum of size is greatly increased in many cases. The girth of some of the viperine snakes is very great, and dissection reveals masses of fat.

Melanism is also common in material from this locality. In this as in the greater limits of size, there is a marked affinity with island forms.

Burrowing reptiles flourish, the small snakes and particularly the short-limbed skinks being very common. The Museum collector obtained practically all his specimens of snakes and frogs by night, with the aid of an electric torch.

No earlier list of species from the Cameron Highlands has been published, but where I have seen a previous record of a species from this locality, the fact is mentioned.

Three species and one genus are described as new. Where more than one specimen was available the description has been made as complete as possible with the material available, and is not restricted to the type, details of which are given where it does not coincide with the series as a whole. The following are described as new:—

#### AMPHIBIA

*Rana nitida*, sp. n.

#### REPTILIA

*Natrix sanguinea*, sp. n.

*Collorhabdium williamsoni*, gen. et sp. n.

#### THE COLLECTIONS

Where a species is previously recorded from the Peninsula only references to local provenance are given, usually beginning with Boulenger's "Fauna of the Malay Peninsula". Where not otherwise stated specimens were taken by a Museum collector. Prof. Williamson's contributions are labelled "(K. B. W.)". All are from the Cameron Highlands area; a more precise locality is given where known.

#### AMPHIBIA

*Rana laticeps* Blgr.

Boulenger, Fauna Mal. Pen., 1912, p. 230 and Rec. Ind. Mus., XX, 1920, p. 67; M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 271 and Bull. Raffles Mus., 3, 1930, p. 98.

Four young specimens.

The smallest example has a dark line from the snout along the canthus rostralis above the eye to the tympanic ridge; cheeks spotted with black and white; a light-edged dark cross-band between

the eyes; dorso-lateral fold with a black line, below which the sides are darker than the back with light spots; a  $\Lambda$ -shaped black mark on the back; limbs with dark cross-bars; undersurface whitish with obscure spotting.

A second specimen has the  $\Lambda$ -shaped mark on the back interrupted and continued posteriorly by dark dorso-lateral lines; a few spots on the back.

The two largest specimens have the cheeks and back freely covered with blotches in addition to the usual markings; under-surface of throat, sides of belly, and hind limbs spotted.

*Rana nitida* sp. n. (Plate II).

Tanah Rata, 4; Brinchang Rd., 1.

Vomerine teeth in strong oblique series between but separated from choanae, extending behind their hinder borders; lower jaw with two bony prominences, more powerfully developed in the male. Head distinctly broader than long, depressed; snout rounded, projecting beyond the mouth, much longer than the eye; canthus rostralis obtuse, loreal region slightly concave; nostril slightly nearer the tip of the snout than the eye; distance between the nostrils equal to the interorbital width, which is about twice that of the upper eyelid; tympanum not distinct, about  $1\frac{1}{2}$  times in eye.

Tips of fingers obtusely swollen, first finger a little longer than second; sub-articular tubercles strong.

Toes long, with very small discs; the web extends from the tip of the first to about half-way up the second toe, from the tip of the second to two-thirds of third, from tip of third to two-thirds of fourth, from two-thirds of fourth to tip of fifth. A long and narrow inner metatarsal tubercle; no outer metatarsal tubercle; sub-articular tubercles moderately prominent. Tibio-tarsal articulation reaches well beyond tip of snout; heels slightly overlapping.

Skin smooth; upper eyelid with a few (usually white) tubercles posteriorly. A fold above the tympanum and a narrow but prominent dorso-lateral fold; smooth below.

Greyish or greyish-brown above; a dark band bordered anteriorly with yellow between the eyes; cheeks mottled with white and brown, the white predominating in the angle of the tympanic fold, which is outlined in black from eye to shoulder; dorso-lateral fold sharply delineated in black; a black mark on the back which may take any of the following forms:—  $\perp$   $\dot{\perp}$   $\Lambda$ , the last in young specimens. Sides below the fold bluish-grey mottled with brown. Hind-limbs with dark cross-bars. Under-surface uniform sulphur-yellow.

Length 71 mm.

The type is a female; the male is without secondary sexual characters except for the slightly broader head and smaller size, an apparently fully-grown male measuring 51 mm. from snout to vent.

Allied to *R. laticeps* from which it differs in the greater size, longer hind-limb, smooth skin, presence of a narrow but very distinct dorso-lateral fold. and in coloration.

***Rana signata* (Gthr.).**

*Rana signata*, Boulenger, Fauna Mal. Pen., 1912, p. 237; van Kampen, Amphib. Indo-Austr. Arch., 1923, p. 227; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 103.

*Rana picturata*, M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 272.

Tanah Rata, 5; Sungei Brinchang, 1.

One specimen has the dorso-lateral chain of large warts mentioned by van Kampen; in the remainder the dorso-lateral fold is present in varying degrees of prominence.

Previously recorded in the Peninsula from the foot of Gunong Inas and Tasan, Isthmus of Kra, its presence is confirmed by the present series and by a young individual recently taken by Mr. G. Hope Sworder at Kota Tinggi, Johore, and presented to the Raffles Museum.

***Rana livida* (Blyth).**

Boulenger, Fauna Mal. Pen., 1912, p. 245 and Rec. Ind. Mus., XX, 1920, p. 214; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 110.

A single specimen, 84 mm. in length, appears to be referable to this species. The colour of the dorsal surface, in spirit, is a uniform dark grey.

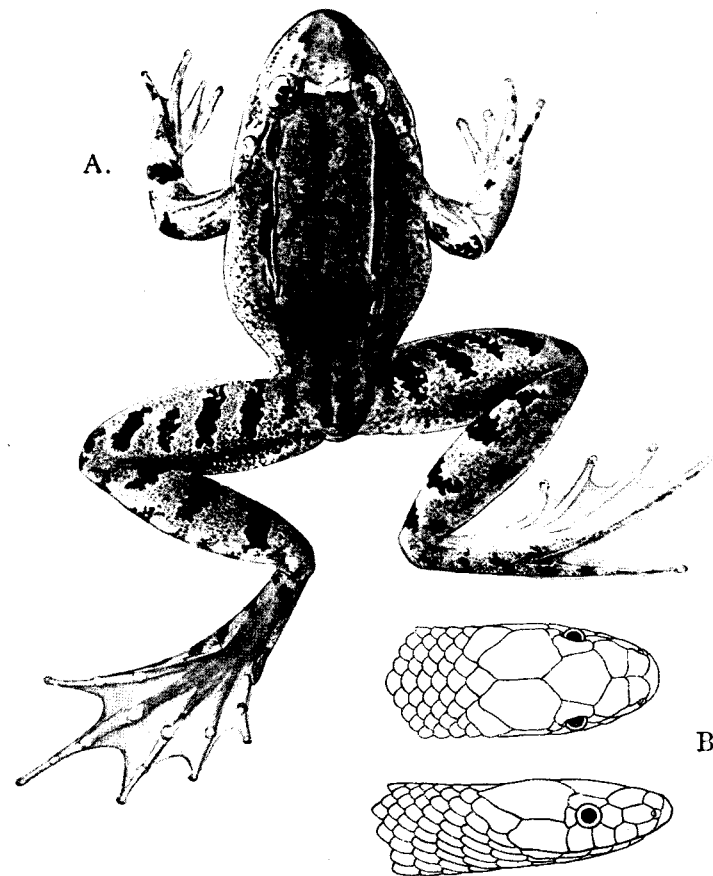
***Rana larutensis* Blgr.**

*Rana larutensis*, Boulenger, Fauna Mal. Pen., 1912, p. 245; M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 277 and Bull. Raffles Mus., 3, 1930, p. 110.

*Stauroids larutensis*, Boulenger, Ann. Mag. Nat. Hist. (9), I, 1918, p. 374.

Tanah Rata, 1 ♂; Sungei Brinchang, 2 ♀♀.

All agree well with the specimens described by Smith (1922) in being extensively blotched with black. The total length of the male is 40 mm., of the females 75 mm. and 70 mm. The range of size is extended to 80 mm. by a female from Lubok Tamang, Lipis District, Pahang (3,500'), now in the collection of the Raffles Museum. This specimen has the ventral surface of the head, chest and hind-limbs heavily spotted. The specimens from the Cameron Highlands are only faintly marked beneath; the web between the toes is grey, streaked and spotted with lighter.



A. *Rana nitida* Smedley. Slightly reduced.

B. *Collorhabdium williamsoni* Smedley. × 3.

**Philautus petersi** (Blgr.).

*Ixalus petersi*,<sup>1</sup> Boulenger, P. Z. S., 1900, p. 185, fig. (Borneo).

*Ixalus larutensis*, Boulenger, Fauna Mal. Pen., 1912, p. 253.

*Ixalus castanomerus*, Boulenger, Fauna Mal. Pen., 1912, p. 254;  
M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 280.

*Philautus petersi*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 116.

A single specimen, in which the tibio-tarsal articulation surpasses the tip of the snout, a condition also observed in other material from the Malay Peninsula and Borneo. The description should be modified accordingly.

Under-surface covered with prominent warts, which are absent on the throat in some of the specimens available for comparison.

Colouring very dark, markings obscure.

**Rhacophorus bimaculatus** (Blgr.).

Boulenger, Fauna Mal. Pen., 1912, p. 250; M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 278 and Bull. Raffles Mus., 3, 1930, p. 114.

Two specimens of this handsome frog were taken; they agree with a specimen from Fraser's Hill. An individual from Peninsular Siam agrees in the main, but has in addition a sprinkling of fine black spots dorsally.

Violet-brown above obscurely blotched with darker; dark cross-bars on the limbs; no yellowish-white blotches on the upper lip; lower surface bright sulphur yellow. A large black blotch in the axilla (usually hidden by the arm); one or two smaller black spots on the side and on the under-side of the fore-arm.

The specimens measure 35 mm. and 25 mm. respectively.

**Microhyla annectens** Blgr.

Boulenger, Fauna Mal. Pen., 1912, p. 262; Parker, Ann. Mag. Nat. Hist. (10), II, 1928, p. 482; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 127.

Two specimens, 16 mm. and 17 mm. in length.

The general body colour has a grey basis with a rosy tinge on back and limbs.

Specimens from the Larut Hills are in the Raffles Museum and the Selangor Museum; *M. annectens* would appear to be a hill species, but for the fact that Boulenger (1912) records examples from the entrance to the Batu Caves, Selangor: I have not seen them. It is probable that the Batu Caves specimens are amongst those referred by Parker (1928) to *M. palmipes*, which is known from the same locality.

<sup>1</sup> The reference given by Smith (1930) under this heading in the synonymy of *Ph. petersi* to "Boulenger, p. 252" is a slip.

**Megophrys longipes** Blgr.

*Megalophrys longipes*, Boulenger, Fauna Mal. Pen., 1912, p. 280;  
M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 282.

*Megophrys longipes*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 132.  
Tanah Rata, 4, 1 (K. B. W.); Brinchang, 1; Rhododendron Hill, 1.

The degree of melanism varies considerably. The markings on the belly disappear with age, those on the throat become less well-defined.

The specimen taken by Prof. Williamson was found in the gut of a snake, *Pseudoxenodon macrops*.

**REPTILIA****Sauria****Peropus larutensis** (Blgr.).

*Gehyra larutensis*, Boulenger, Fauna Mal. Pen., 1912, p. 48.

*Peropus larutensis*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 17.

2 ♀ ♀, both measuring 50 mm. from snout to vent; tail, 40 mm.

These specimens, both gravid, are of much greater size than any previously recorded.

The symphyial shield in both cases is not truncate, and is considerably larger than the median chin-shields. The labial shields vary in number from 9 to 10. Four or five digital lamellae.

The upper surface is grey, and the markings on the back take the form of somewhat obscure wavy cross-bands. Under-surface whitish, the anterior half of the tail conspicuously orange-red in one specimen, less distinctly so in the other.

These specimens agree well with one recently added to the Selangor Museum collection, from Bukit Kutu in Selangor, 3,500 ft.

**Gonocephalus robinsonii** Blgr.

*Gonocephalus robinsonii*, Boulenger, Fauna Mal. Pen., 1912, p. 67;  
M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 269.

*Gonocephalus robinsonii*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 24.

Tanah Rata, 2 ♂ ♂ 1 ♀ : 1 ♀ (K. B. W.); Padang Road, 1 ♂, 1 ♀.

Boulenger considers that this species connects the genera *Gonocephalus* and *Calotes*. I am in some doubt as to which genus should properly include it; the gular fold is hardly recognisable, if at all, but the skull rather tends toward that of *Gonocephalus*.

Boulenger's description, based on one adult and one young specimen, is somewhat inadequate; the following is a description based on the material before me.

Tympanum small, about one-third the diameter of the eye-opening; upper head scales rather small, keeled; a few enlarged scales on the snout; a row of enlarged scales from the snout spreading behind to a **A** shape before the eyes; upper edge of orbital fossa marked by a row of large scales and a transverse row in front of the parietal region; a tubercle behind the supraciliary edge, a group of tubercles on occiput and others on the nape. Nine or ten upper and eight to ten lower labials. A large gular sac; scales on the throat smooth or obtusely keeled. An oblique fold in front of the shoulder; gular fold feebly distinct only on the sides.

Nuchal crest of stout flat spines, height less than the diameter of the orbit; the dorsal crest continuous with the nuchal and lower, gradually decreasing posteriorly.

Body compressed, covered with small scales, obtusely-keeled above. of which there may be more than 100 round mid-body, the upper ones pointing upwards, the lower ones downwards; a few obliquely transverse rows of enlarged scales on the sides. Ventral scales larger than dorsals, sharply keeled.

Limbs above with large, equal, keeled scales; third and fourth fingers sub-equal, fifth toe much shorter than third; adpressed hind-limb almost reaching nostril. Tail round, compressed and slightly keeled at base.

Greenish above, with obliquely transverse dark bands; lips white, the scales outlined in black; eye-lids black; a blackish streak from eye to tympanum; the fold in front of the shoulder black; gular pouch of male with a fleshy tinge, of female greenish-yellow with fine white striae. Throat of male uniform whitish-grey or with brown blotches, of female greenish with white striations. A young male has the markings more pronounced, and the tail with alternate black and yellow bands.

The eggs are oval, slightly more elongate than those of *G. kuhli* as illustrated by Kopstein's photograph (Treubia, XI, 1929-30, p. 301, pl. VIII).

**Mabuya multifasciata** (Kuhl).

*Mabuia multifasciata*, Boulenger, Fauna Mal. Pen., 1912, p. 84;  
Sworder, S'pore. Nat., I, No. 5, p. 67.

*Mabuya multifasciata*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 31.

Cameron's Highlands, c. 5,000', 1 (K. B. W.); Sungei Olung, 2; Tanah Rata, 1 imm.

Common in the Peninsula at all altitudes.

**Tiliqua praesigne** (Blgr.).

*Lygosoma praesigne*, Boulenger, Fauna Mal. Pen., 1912, p. 88.

*Mabuia praesigne*, M. A. Smith, Journ. N. H. S. Siam, II, 1916, pp. 55 and 156

*Mabuya praesigne*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 31. Tanah Rata, I.

The prefrontals are separated, the frontal forming a short suture with the fronto-nasal; four supra-oculars; parietals forming a well-defined suture behind the interparietal. No auricular lobules, but the scales bordering the anterior margin of the ear-opening prominent.

Twenty-six smooth scales round the body; twenty-five lamellae beneath the fourth toe.

Coloration as given in Boulenger's description, but ventral surface pale blue shading to white on the limbs.

From snout to vent 94 mm.; tail, 155 mm.

Smith has pointed out that this lizard must be removed from the genus *Lygosoma* on account of the extent of the palatal notch. The absence of internasals, however, indicates that its affinities are with *Tiliqua* rather than *Mabuya*.

**Lygosoma larutense** Blgr.

Boulenger, Fauna Mal. Pen., 1912, p. 91; M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 271 and Bull. Raffles Mus., 3, 1930, p. 38.

Prof. K. B. Williamson has forwarded two specimens taken during 1930 at the Cameron Highlands (c. 5,000'), one by himself and one by Mr. Drewitt.

Mr. Drewitt's specimen has a snout-vent length of 175 mm.; tail, 80 mm. (regrown). It has 30 scales round the middle of the body, agreeing in this detail with the specimen recorded by Smith (1922) from Gunong Tahan. It has also the three narrow transverse yellowish bars on the neck, the last interrupted; no longitudinal lines on the body.

The other example has a snout-vent length of 160 mm.; tail, 65 mm. (regrown). Twenty-eight scales round the middle of the body. Markings as in the foregoing.

In the Selangor Museum there are two specimens from the Larut Hills. Perak; they have 26 scale-rows at mid-body. Both are lighter ventrally but lack the markings on neck and body. The larger has a snout-vent length of 115 mm.; tail, 150 mm., and is therefore larger than Boulenger's previously recorded maximum, though not so well-grown as those from the Cameron Highlands.

A specimen in the Raffles Museum, from Maxwell's Hill, Perak, collected in 1908, has 26 scale-rows.

From a longer series it might be possible to differentiate two varieties, the typical form with 26 scale rows and without the banded neck, and a variety with 28-30 scale rows, banded neck and attaining a larger size.

Prof. Williamson found *L. larutense* common at the Cameron Highlands during the process of clearing when cutting and burning of the jungle drove it out into the open. Many were to be seen lying dead on the roads during July, 1930.

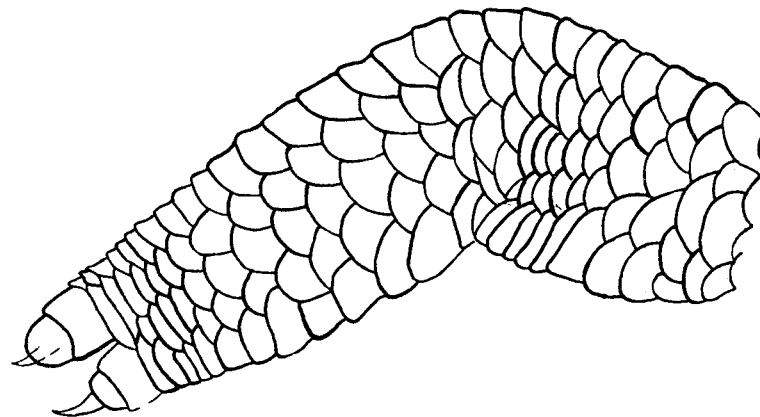


Fig. 1. *Lygosoma larutense*. Fore-limb  $\times 11$ .

A figure of the fore-limb (fig. 1) is given for comparison with those of the following species; there is a distinct elbow-joint; the digits though small are readily distinguishable and the sheathing scale of the claws is retractile.

**Lygosoma miodactylum** Blgr.

Boulenger, Fauna Mal. Pen., 1912, p. 98; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 38.

Tanah Rata, 6; I, (K. B. W.); I, (N. C. E. Miller); I, (Selangor Museum collector).

Mr. Miller's specimen, taken in March, 1930, is the second to be collected and Prof. Williamson's the third. The remainder were taken by collectors of the Raffles and Selangor Museums.

One specimen (K. B. W.) agrees well with the description given by Boulenger; it has the fourth labial below the eye, but this appears to be an aberration and the description should be amended accordingly. Snout to vent, 90 mm.; tail, 100 mm.

In the Selangor Museum specimen the third labial is below the eye on one side, the fourth on the other.

All the others have the third labial below the eye. The normal number of scale-rows is 22; one specimen (N. C. E. M.) has only 20.

So great is the variation in the form of the limbs in this species that I was at first inclined to regard some of the specimens as distinct. Dr. Malcolm Smith kindly compared material with the type in the British Museum, in which he finds evidence of greater degeneration in the digits of one side than of the other. A closer examination of the material reveals that the limbs may bear two well-defined claws or none at all and intermediates are present in which the two limbs of a pair may differ. The type has "two minute toes on one side and two larger ones on the other" (M. A. S.). Another specimen has two minute digits on one side and none on the other, and yet another has only one digit, exceedingly minute, on one fore-limb.



Fig. 2. *Lygosoma miodactylum*.—Variations in development of fore-limb  $\times 11$ .

The extremes to be found are shown in Fig. 2, *a* and *b*. The Cameron Highlands material is clearly divisible into a stable two-clawed form with a comparatively long fore-limb, and a variable and degenerate short-limbed form, generally without claws, but showing traces of one or two minute claws in some specimens. The latter may yet prove a separate species.

### Serpentes

#### *Xenopeltis unicolor* Reinw.

Boulenger, Fauna Mal. Pen., 1912, p. 113; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 39.

Prof. Williamson took a specimen of this common burrowing snake at 4,600'. The headless skin was preserved. Usually regarded as a lowland form, the only other records from hills appear to be Penang Hill, and the Tengger Mts. in Java (de Rooij, Rept. Indo-Austr. Arch., II, 1917, p. 39).

#### *Sibynophis collaris* Blgr.

*Polyodontophis collaris*, M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 265.

*Sibynophis collaris*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 40. Tanah Rata, I (K. B. W.).

The only previous record of this snake in the Malay Peninsula is that of Smith (1922).

The present specimen agrees with that from Gunong Tahan, Pahang, in its dark coloration. The ventral shields, for more than half the length of the snake bear pairs of median dots.

Ventrals, 170; sub-caudals, 89. Total length, 600 mm.; tail, 180 mm.

#### *Natrix inas* Laidlaw.

*Tropidonotus inas*, Boulenger, Fauna Mal. Pen., 1912, p. 125; M. A. Smith, Journ. N. H. S. Siam, II, 1916, p. 159.

*Natrix inas*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 43.

A very large specimen, collected by Prof. K. B. Williamson, agrees well with the description given by Smith (1916).

The following is a description of the specimen:—

Eye moderate. Internasals slightly narrowed in front, shorter than the prefrontals; frontal about  $1\frac{1}{2}$  times as long as broad, longer than its distance from the end of the snout, shorter than the parietals; loreal slightly longer than deep; two pre- and three post-oculars; temporals 1 + 2; 9 upper labials, fourth, fifth and sixth entering the eye; 5 lower labials in contact with the anterior chin-shields, which are shorter than the posterior.

Scales keeled, of outer row feebly, in 19 rows. Ventrals, 144; anal divided; sub-caudals, 73, rather angulate laterally. Maxillary teeth 30, the last two somewhat enlarged.

Blackish-olive above, with indistinct black spots; a feebly-marked series of yellowish spots on the sides, forming transverse bars anteriorly. Labials whitish with black spots, the last three upper labials black with white spots, which merge into a whitish streak from the gape running backwards and confluent with the first few transverse bars. Below white with a squarish black spot at the outer margin of each ventral shield, these spots confluent with one another and with the body colour posteriorly. Head above brownish, variegated with black; chin and throat black-spotted.

Total length, 615 mm.; tail, 173 mm.

*Natrix inas* and the closely allied *N. conspicillata* appear to vary as to the degree of development of the posterior teeth; they might apparently be placed in either division of the genus. *N. inas* must be regarded as normally having three labials in contact with the eye, and probably the internasals somewhat narrowed anteriorly. It is separable from *N. conspicillata* on the greater number of sub-caudals, and on colour.

**Natrix sarawacensis** (Gthr.).

*Tropidonotus saravakensis*, Kloss, Journ. F. M. S. Mus., VI, 1915, p. 42.

*Natrix sarawacensis*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 45. Tanah Rata, 1 (K. B. W.).

A very young specimen. Head and upper surface almost black.

Temporals 1 + 1 and 1 + 2, in which it somewhat resembles the specimen, also from the Cameron Highlands, recorded by Smith (1930). The anal scale is entire, which is unusual in the species.

**Natrix sanguinea** sp. n.

The Museum collector obtained a single specimen of a snake which appears to me to be undescribed. It seems to be most nearly allied to *N. conspicillata*.

Maxillary teeth 26, the last two somewhat larger and stouter than those preceding. Head distinct from neck; eye moderate; body rather slender. Rostral broader than high; internasals narrowed anteriorly, shorter than the pre-frontals; frontal much longer than broad, about as long as its distance from the tip of the snout, much shorter than the parietals; loreal longer than high; two pre- and three post-oculars; temporals 1 + 1; 9 supra-labials, fourth, fifth and sixth entering the eye; 5 lower labials in contact with the anterior sub-linguals, which are shorter than the posterior pair.

Scales in 19 rows at the middle of the body, reduced to 17 posteriorly, all strongly keeled. Ventrals, 155; anal divided; sub-caudals, 42 (tail incomplete).

Crimson above, four or five vertebral rows of scales olive with diamond-shaped black markings; two alternating rows of black spots laterally; head dark olive, a black-edged white line starting behind the eye, interrupted above the angle of the jaw and continued on to the nape, labials whitish with black sutures. Lower surface crimson, with a faint black spot at the outer edge of each ventral; chin and throat whitish, the anterior sub-linguals marked with black.

Total length 475 mm.; tail (incomplete), 82 mm.

**Pseudoxenodon macrops** (Blyth).

*Tropidonotus macrops*, Blyth, Journ. Asiat. Soc. Bengal, XXIII, 1855, p. 296.

*Pseudoxenodon macrops*, Boulenger, Fauna Brit. India, Rept. and Batr., 1890, p. 340 (with synonymy); Smedley, Bull. Raffles Mus., 5, 1931, p. 51.

Tanah Rata, 3 (K. B. W.).

In recording this snake for the first time from the Peninsula, I omitted to include a description of the species. Blyth's original description cannot be profitably employed as it is not drawn up in modern herpetological terms; the following is that given by Boulenger (loc. cit. supra).

"Eye large, its diameter more than its distance from the nostril; rostral just visible from above; suture between the inter-nasals shorter than that between the præfrontals; frontal slightly shorter than its distance from the end of the snout, shorter than the parietals; loreal as long as deep or deeper than long; one præocular; three postoculars; temporals 2 + 2; 8 upper labials, fourth and fifth entering the eye; 4 or 5 lower labials in contact with the anterior chin-shields, which are a little shorter than the posterior. Scales more or less strongly keeled, in 19 rows anteriorly, in 17 on the middle of the body. Ventrals, 160-173; anal divided; sub-caudals 60-75. Brown or olive above, with or without a dorsal series of reddish-brown or orange spots, and a dorso-lateral series of black spots; a more or less distinct chevron-shaped dark marking, pointing forwards, may be present on the nape; anterior part of belly with large quadrangular blackish-brown spots, posterior part and lower side of the tail clouded with brown.

Total length 39 inches; tail 7."

All three specimens differ from the description in having four post-oculars, but another specimen from the same locality has only three.

A specimen of 650 mm. in length has the upper lip and neck suffused with bright yellow; in others this region is yellowish or white. This specimen had swallowed a frog, *Megophrys longipes*.

A 500 mm. specimen has a dorsal series of spots, very distinct posteriorly.

**Lycodon butleri** Blgr.

Boulenger, Fauna Mal. Pen., 1912, p. 133; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 46.

Tanah Rata, 3 (K. B. W.).

One specimen consists of head and neck only, and agrees with the description with the exception of the temporal shields which are 2 + 3 and 2 + 4.

The second example has a total length of 750 mm., tail, 150 mm. [The previously recorded maxima are 540 mm. and 115 mm. respectively]. Temporals, 2 + 2 and 1 + 2; ventrals, 227, the upper few rows feebly keeled. Forty-eight light annuli.



A third young specimen has a total length of 560 mm.; tail, 120 mm. Ventrals, 222; sub-caudals, 83. Forty-seven black, white-edged annuli.

Hitherto the species was known only from the Larut Hills, Perak, 5,000 ft. The Raffles Museum possesses a specimen from "The Box", Maxwell's Hill, 4,000' (13.4.1903), in which the loreal is fused with the prefrontal on both sides of the head.

### *Elaphe porphyracea* (Cant.).

*Coluber porphyraceus*, Boulenger, Fauna Mal. Pen., 1912, p. 140.

*Elaphe porphyracea*, Smith, Bull. Raffles Mus., 3, 1930, p. 48.

Tanah Rata, 2; 3 (K. B. W.).

The record of this snake from Singapore being discounted, the only locality in which it has appeared in Malaya is the Cameron Highlands area. Smith (1930) records a specimen taken by Surgeon-Commander Buddle in 1928. This is a juvenile, 435 mm. in total length, tail incomplete. The colour of the cross-bands is much the same as that of the rest of the body, yellowish-brown, but the black lines stand out in strong relief. The two longitudinal black lines posteriorly are much broken up and anastomosing with the cross-bands.

The juvenile of the present series is about 255 mm. in length, and has the dark and light bands very strongly marked in tones of brown.

The remaining three are of a handsome deep crimson colour, whitish below, with the black lines as described for the other specimens. The largest snake measures 960 mm.; tail, 190 mm. It is therefore the largest yet put on record. Another specimen of 800 mm. with a tail of 148 mm. in length has nine upper labials on the right side, the fifth and sixth entering the eye; the left side is normal. A gravid female has a total length of 765 mm.; tail, 143 mm. The egg is 48 mm. in length.

### *Macrocalamus lateralis* Günth.

Boulenger, Fauna Mal. Pen., 1912, p. 153; M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 266 and Bull. Raffles Mus., 3, 1930, p. 57; Smedley, Bull. Raffles Mus., 5, 1931, p. 50.

Tanah Rata, 1 ♂, 2 ♀ ♀; 3 ♂ ♂, 1 ♀ (K. B. W.); Telom Valley, 1 ♂ (K. B. W.).

I have recorded a very large specimen from the Cameron Highlands (1931). The present series includes a specimen, from the Telom Valley, of even greater size (385 mm.).

Examination of a series reveals a difference between the sexes in scale counts and length of tail; the list of measurements herewith includes all the specimens in the Raffles Museum.

| Locality                            | Sex | Total Length | Tail   | Ventrals  | Sub-caudals |
|-------------------------------------|-----|--------------|--------|-----------|-------------|
| Larut Hill, Perak ...               | ♂   | 213 mm.      | 32 mm. | 109       | 26          |
| do. ...                             | ♂   | 220 "        | 31 "   | 109       | 25          |
| Cameron Highlands ...               | ♂   | 380 "        | 57 "   | 119       | 27          |
| do. ...                             | ♂   | 370 "        | 45 "   | 132       | 26          |
| do. ...                             | ♂   | 340 "        | 50 "   | 121       | 28          |
| do. ...                             | ♂   | 113 "        | 16 "   | 114       | 25          |
| do. ...                             | ♂   | 125 "        | 12 "   | 125       | 26          |
| Telom Valley, Cameron Highlands ... | ♂   | 385 "        | 58 "   | 119       | 28          |
| Maxwell's Hill Perak ...            | ♀   | 242 "        | 25 "   | 121       | 19          |
| do. ...                             | ♀   | 200 "        | 19 "   | 112       | 18          |
| Larut Hills, Perak ...              | ♀   | 220 "        | 22 "   | 118       | 20          |
| Cameron Highlands ...               | ♀   | 195 "        | 20 "   | 119       | 20          |
| do. ...                             | ♀   | 175 "        | 17 "   | 131       | 21          |
| do. ...                             | ♀   | 113 "        | 10 "   | 114       | 20          |
|                                     |     | ♂ ♂          |        | ♀ ♀       |             |
| Ventrals ...                        |     | 109 - 132    |        | 112 - 131 |             |
| Sub-caudals ...                     |     | 25 - 28      |        | 18 - 21   |             |

The ventral count is not affected by the sex, as is the case in the allied *Pseudorabdion longiceps*.

In young specimens there is a white lateral line above the black line and the reddish colour of the ventral surface is very pronounced. There is a series of light spots on each side of the dorsal surface about four scales above the white line. A female specimen of 195 mm. has the markings very distinct. This specimen had swallowed a large earthworm.

*M. lateralis* has hitherto been regarded as rare, but it is evidently a common snake at high altitudes.

### *Collorhabdium* gen. n.

Head not distinct from neck; eye small; pupil round; nostril between a small anterior and very large posterior nasal; prefrontal not entering the eye; preocular and temporals absent. Maxillary teeth 9, anterior slightly enlarged; posterior mandibular teeth shorter. Body round, covered with smooth scales without apical pits, in 15 rows; ventrals rounded. Tail short; sub-caudals in two rows.

Differs from *Agrophis*, a genus occurring in Celebes and Borneo in that the prefrontal does not enter the eye, and in the smaller number of maxillary teeth.

(Genotype *Collorhabdium williamsoni*).

***Collorhabdium williamsoni*** sp. n. (Plate II and fig. 3, *a.* and *b.*).

Snout obtusely pointed, projecting; rostral large, visible from above; suture between internasals equals (in *type*) or slightly exceeds in length that between the prefrontals; frontal longer than broad, longer than its distance from the tip of the snout, shorter than the parietals, more than twice as broad as the supraocular; preocular large; a single post-ocular; no temporals; five upper labials, third and fourth entering the eye; first lower labial in contact with its fellow behind the mental; anterior sub-linguals much longer than posterior, in contact with 4 (3) lower labials. Tail pointed. Scales in 15 rows; ventrals (146 in *type* ♂) 144-152 (♂), 161 (♀); anal entire, last ventral sometimes divided; sub-caudals (31 in *type* ♂) 30-32 (♂), 22 (♀).

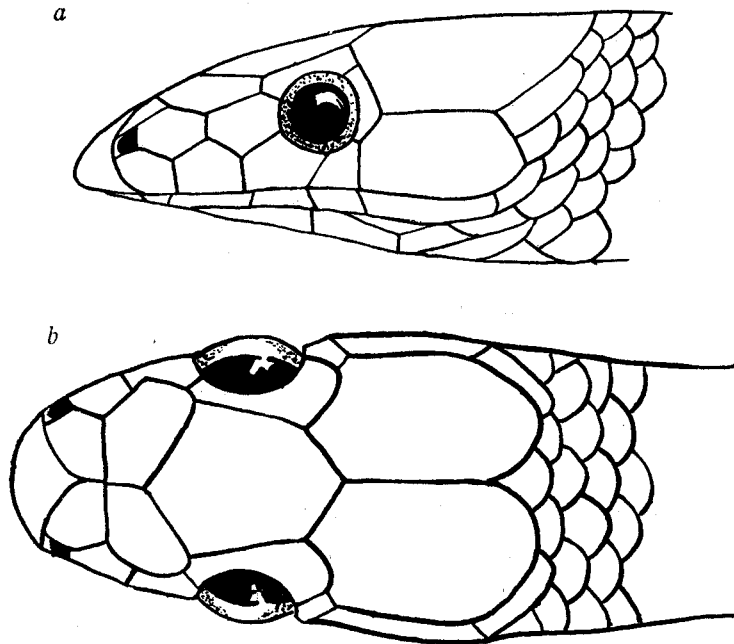


Fig. 3. *Collorhabdium williamsoni*.—Head  $\times 10$ .

*a.*—Side view.

*b.*—Dorsal surface.

Brownish or blackish above, iridescent; the head may have yellow markings; seven longitudinal black lines present or indistinct on body. Below white, the brown body-colour extending on to the outer edges of the ventrals, a little more on the anal scale. Chin and throat speckled with dark. Faint traces of a median dark line on the tail may be present or absent. Total length of *type* male, 236 mm., of female 230 mm.; tail of male, 36 mm., of female, 23 mm.

Described from a male taken by a Raffles Museum collector at Tanah Rata, Cameron Highlands, Malay Peninsula, and two males and a female from the same locality taken by Prof. K. B. Williamson. The female was gravid, the egg measuring 23 mm., elongate.

The species is named after Prof. K. B. Williamson, to whose interest a great part of the present collection is due.

***Calamaria vermiformis*** D. and B.

Boulenger, Fauna Mal. Pen., 1912, p. 155; M. A. Smith, Journ. N. H. S. Siam, II, 1916, p. 162 and Bull. Raffles Mus., 3 1930, p. 58.

Tanah Rata, 1 (K. B. W.).

Head yellowish-white, a black streak before the frontal, supra-ocular and sub-oculars blackish, a transverse yellow streak on the nape, partly confluent with the yellow colour of the head. Belly with black cross-bands. Length 165 mm.

Previously known in the Malay Peninsula from the Larut Hills and Gunong Kledang in Perak, Gunong Pulai in Johore, and Patani.

***Psammodynastes pulverulentus*** (Boie).

Boulenger, Fauna Mal. Pen., 1912, p. 173; M. A. Smith, Journ. N. H. S. Siam, II, 1916, p. 162, Journ. F. M. S. Mus., X, 1922, p. 267 and Bull. Raffles Mus., 3, 1930, p. 66.

Tanah Rata, 2 (K. B. W.).

The larger specimen, about 500 mm. in length is ochraceous in colour and the iris is golden-brown. The ventrals are yellow, finely speckled with brown, and there are in addition from two to five longitudinal series of blackish-brown spots.

The small snake measures 285 mm. in total length. The colour is light grey speckled with black and white above, with grey stripes on the head; iris silver-grey. The ventrals are spotted with grey and bear several series of longitudinal blotches. Anteriorly there are some splashes of bright yellow at the junction of costals and ventrals, round the edges of the scales. The opening of the gut revealed a partly-digested skink. Only the posterior portion from

just in front of the anal scale remained. The hind-limbs were rather short with well-developed digits and the tail, which was fine and tapering measured over 100 mm.

**Maticora intestinalis** (Laur.) var. **nigrotaeniata** Ptrs.

Two specimens taken by Prof. K. B. Williamson are referred to this variety.

They agree in all particulars with specimens recently recorded by Smith (M. A. Smith, Bull. Raffles Mus., 5, 1931, p. 28) from Mt. Kina Balu in North Borneo. The dark cross-bands are much narrower than the interspaces, differing in this respect from the description given by Peters, but the series from Kina Balu includes examples similar to the above and others in which the cross-bands are wider than the interspaces. The ventral surface may be bright red or yellow, the bright colour not fading with age.

The larger of the two specimens contained near the vent an egg measuring 27 mm. x 8 mm., in front of which was another abnormal egg which measured 68 mm. x 8 mm.

The variety *nigrotaeniata* is probably purely montane in habitat.

**Pareas<sup>1</sup> vertebralis** Blgr.

*Amblycephalus vertebralis*, Boulenger, Fauna Mal. Pen., 1912, p. 210; M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 88.

Tanah Rata, 2; 3 (K. B. W.).

As all but one (juvenile) are very much bigger than the maximum measurements given by Boulenger I have thought it worth while to give particulars of all the present series.

| Total Length | Tail    | Ventrals | Sub-caudals |
|--------------|---------|----------|-------------|
| 771 mm.      | 132 mm. | 186      | 57          |
| 686 "        | 128 "   | 181      | 61          |
| 632 "        | 140 "   | 188      | 78          |
| 601 "        | 133 "   | 189      | 72          |
| 295 "        | 58 "    | 187      | 78          |

The largest specimen lacks the azygous chin-shield.

In all the adults the dorsal markings are absent, the colour being dark brown. The young specimen has well-marked cross-bands. It had swallowed a slug.

<sup>1</sup> Dr. Malcolm Smith (*in litt.*) remarks that *Pareas* antedates *Amblycephalus*.

**Trimeresurus monticola** Gthr.

*Lachesis monticola*, Boulenger, Fauna Mal. Pen., 1912, p. 215.

*Trimeresurus monticola*, M. A. Smith, Bull. Raffles Mus., 3, 1930, p. 90.

Tanah Rata, 3 (K. B. W.).

The colour of two adult specimens is very dark.

The largest, measuring 710 mm. in total length, tail 60 mm., has nine upper labials on each side; a loreal cut off from the second upper labial borders the pit. This condition is partially indicated in a somewhat smaller specimen, with eight upper labials, in which the second labial is traversed by a furrow; a juvenile has a very faint furrow on the second labial. The ventral counts for the two adult specimens are 133 and 135 respectively; sub-caudals, 23 and 25.

The largest snake, a female, contained twenty-one roundish eggs.

**Trimeresurus gramineus** (Shaw).

*Lachesis gramineus*, Boulenger, Fauna Mal. Pen., 1912, p. 217.

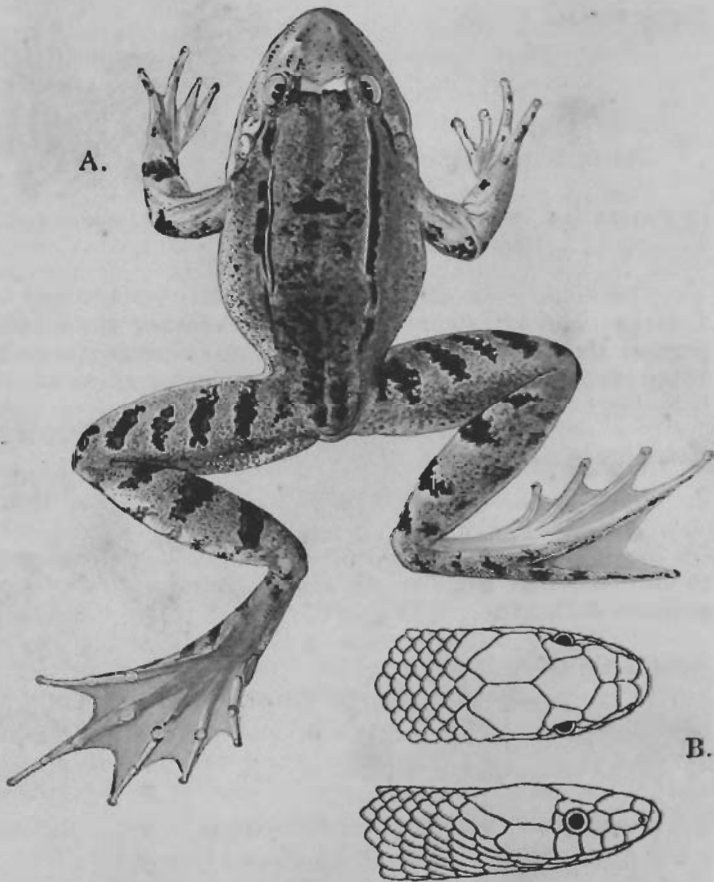
*Trimeresurus gramineus*, M. A. Smith, Journ. F. M. S. Mus., X, 1922, p. 267 and Bull. Raffles Mus., 3, 1930, p. 90.

Tanah Rata, 3 (K. B. W.).

The largest specimen greatly exceeds the previously recorded maximum with a total length of 930 mm.; tail, 150 mm. It is blue-green in colour.

A much smaller specimen is blue-black, with blue-green on the lighter edges of the ventrals.

The third is sage-green with a yellow line just above the ventrals (absent in the other two).



A. *Rana nitida* Smedley. Slightly reduced.

B. *Collorhabdium williamsoni* Smedley.  $\times 3$ .