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## A Review of the Lizards of Ceylon

BY

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ABSTRACT.—The paper deals with the lizard fauna of Ceylon exclusive of the family Scincidae. The material studied is that in the United States National Museum, and that in the Edward H. Taylor—Hobart M. Smith collection (Lawrence, Kansas). Since the species of skinks were treated recently, keys, but not descriptions are included for this Family.

In the total lizard fauna six families, twenty-four genera and sixty-two species and subspecies are represented.

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## INTRODUCTION

This paper concludes my study of the Ceylonese Squamata\* contained in the United States National Museum and those in the Edward H. Taylor-Hobart M. Smith collection. A study of the amphibians is being pursued at the present time.

The material in these collections (approximately 1367 specimens) has recently been augmented by a collection presented by Mr. W. W. A. Phillips, Esq., noted mammalogist of Tonacombe Estates, Namunukula, Ceylon. The lizards from the latter collection are reported in this paper. The snakes from the collection are being reported under another title\*\* in this journal.

While this paper treats of the lizards, exclusive of the family Scincidae, I have, however, listed the genera and species of the scincs, reprinting also keys published in a previous paper (*loc. cit.*).

The recent papers of Mr. P. E. P. Deraniyagala and the recent monograph of Malcolm Smith, (The Fauna of British India, including Ceylon and Burma. Reptilia and Amphibia vol. II, Sauria), have been of great help in this study.

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\* Papers previously published are: Taylor, Comments on Ceylonese snakes of the genus *Typhlops*, with descriptions of new species. Univ. Kansas Sci. Bull., vol. 31, pt. 2, Nov. 1, 1947, pp. 283-298, text-figs. 1-3. Taylor, Ceylonese lizards of the family Scincidae. Univ. Kansas Sci. Bull., vol. 33, pt. 2, March 20, 1950, pp. 481-518, text figs. 1-8.

Taylor, A brief review of Ceylonese snakes. Univ. Kansas Sci. Bull., vol. 33, pt. 2, March 20, 1950, pp. 519-603, pls. 12-25, text-figs. 1-3.

\*\* Report on a small collection of snakes from Uva Province, Ceylon.



## DISTRIBUTION OF ASIATIC LIZARD GENERA

Table of Lizard genera for South Asia.

	Africa	West Asia	India	Ceylon	East Asia	East Ind. Arch.
Teratoscincus.....		x	x		x	
Stenodactylus.....	x	x	x			
Alsophylax.....	x	x	x		x (Tibet)	
Gymnodactylus.....	x	x	x	x	x	x (Aust.)
Agamura.....		x	x			
Pristurus.....	x	x	x			
Cnemaspis.....			x	x	x	x
Calodactylodes.....			x			
Ptyodactylus.....	x	x	x			
Phyllodactylus.....					x	
Dravidogecko.....			x			
Hemidactylus.....	x	x	x	x	x	x (Aust.)
Cosymbotus.....			x	x	x	x
Peropus.....				x	x	x
Hemiphyllodactylus..			x	x	x	x
Gekko.....			x		x	x
Lepidodactylus.....				x		x
Ptychozoon.....					x	x
Phelsuma.....					Andaman Is.	
Teratolepis.....			x			
Lophopholis.....			x	x		
Eublepharis.....		x	x		x	
Draco.....			x		x	x
Sitana.....			x	x		
Otocryptis.....			x	x		
Ptyctolaemus.....			x			
Cophotis.....				x		x
Ceratophora.....				x		
Lyriocephalus.....				x		
Goniocephalus.....					x	x
Mictopholis.....			x			
Oriocalotes.....			x			
Japalura.....					x	x
Salea.....			x			
Calotes.....			x	x	x	x
Psammophilus.....			x			
Agama.....	x	x	x			
Phrynocephalus.....		x	x			
Physignathus.....					x	x (Papuasia) x (Aust.)
Leiolepis.....					x	x
Uromastix.....		x	x			
Mabuya.....	x	x	x	x	x	x
Dasia.....			x	x	x	x
Lygosoma.....					x	x
Sphenomorphus.....			x	x	x	x
Ateuchosaurus.....					x	
Leiopisma.....	x	x	x		x	x
Ablepharus.....		x	x			
Riopa.....	x		x	x	x	x
Tropidophorus.....			x		x	x
Ristella.....			x			



DISTRIBUTION OF ASIATIC LIZARD GENERA—*Concluded*

	Africa	West Asia	India	Ceylon	East Asia	East Ind. Arch.
Ophioscincus.....					x	
Eumeces.....	x	x	x		x	
Scincus.....	x	x	x			
Ophiomorus.....		x	x			
Chalcides.....	x	x				
Barkudia.....			x			
Sepsophis.....			x			
Chalcidoseps.....				x		
Nessia.....				x		
Dibamus.....					x	x
Takydromus.....					x	
Acanthodactylus.....	x	x	x			
Cabrita.....			x	x		
Ophisops.....	x	x	x			
Eremias.....	x	x	x			
Ophisaurus.....	x	x	x		x	x
Varanus.....	x	x	x	x	x	x
Chamaeleon.....	x	x	x	x		

Of the 69 genera appearing in the South Asian list, some 23 have been found to occur in Ceylon and approximately 41 are known to occur in territory formerly regarded as India. However when one considers that *Lyriocephalus*, *Ceratophora* and *Chalcidoseps* are presumably endemic in Ceylon, and *Peropus* and *Cophotes* presumably do not occur in India, only 18 genera (less than one-half) of the 41 known in India occur in Ceylon.

There is a large number of genera largely confined to Africa and southwest Asia which enter India in the drier regions in the northwest, and their further distribution eastward is seemingly limited by their adaptation to relatively low rainfall. In this group are *Teratoscincus*, *Stenodactylus*, *Alsophylax*, *Agamura*, *Pristurus*, *Ptyodactylus*, *Eublepharis*, *Agama*, *Phrynocephalus*, *Uromystax*, *Eumeces*, *Scincus*, *Ophiomorus*, *Chalcides*, *Acanthodactylus*, *Ophisops*, *Eremias* and *Chamaeleon*.

A few genera seem to have entered the Indian territory from the east, among which *Calotes*, *Dasia*, and *Tropidophorus* may be mentioned.

A few genera bespeak a considerable age, and such groups as *Varanus*, *Ophisaurus*, *Leiopisma*, and *Mabuya*, widespread as they are, seemingly have obliterated the evidence of their route of movement in Asia.



## TAXONOMIC TREATMENT

## KEY TO SUBORDERS OF REPTILIA (treated in this work)

- Tongue terminally club-shaped, greatly extensile; skin covered with flattened or rounded tubercles; fingers and toes webbed together in groups of two and three, the groups opposed; eye except pupil covered by a thick granular single lid, each eye independently movable . . . . . Rhyptoglossa
- Tongue not club-shaped, fingers and toes maintain freedom of individual movement; when present not webbed together into groups; eye usually with an upper and lower lid . . . . . Sauria

Of the groups of reptiles treated in this paper a total of six families are represented. The Gekkonidae and Scincidae are widespread cosmopolitan families; the Agamidae, Lacertidae and Varanidae are old world; the Chamaeleonidae occur in Africa and Madagascar with one species entering southwestern Asia and Ceylon.

The Varanidae have formerly been represented in the new world by the Genera *Saniwa*, *Palaeosaniwa*, and *Parasaniwa*. The past history extends from the Upper Cretaceous to the Oligocene. The Chamaeleonidae likewise appear to have been present formerly in the new world based on the Genus *Chamaeleo* in the Upper Cretaceous.

There is no evidence of the presence of the Lacertidae or the Agamidae, the latter being replaced in the Western Hemisphere by the Iguanidae.

Two other Asiatic families are the Anguidae and Dibamidae, neither of which are known to enter Ceylon. The former is represented by the same genus in North America. The Dibamidae have presumably never reached the Western Hemisphere.

## SUBORDER SAURIA

## KEY TO CEYLONESE FAMILIES OF SAURIA

1. Scales on top of head large, arranged symmetrically . . . . . 2  
    No large symmetrical scales on top of head . . . . . 3
2. Scales on entire body cycloid, imbricate, smooth or keeled, with osteodermal plates; no femoral or preanal pores; pleurodont; tongue feebly nicked, covered with imbricate scalelike papilla, . . . . . *Scincidae*  
    Imbricating dorsal and lateral scales on body, strongly differentiated from ventral scales; no osteodermal plates; pleurodont; femoral pores; tongue forked, anteriorly covered with imbricate papillae, or plicae . . . . . *Lacertidae*
3. Body scales imbricate; tongue rather broad and short, smooth or with villose papillae; eyes with movable lids; acrodon . . . . . *Agamidae*  
    Body skin tubercular or granular, rarely with some imbricating dorsal scales; eyes without or with movable lids; pleurodont . . . . . 4



4. Tongue broad, short, covered with villose papillae, eyes without movable lids; femoral and preanal pores usually present; scales granular or tubercular, rarely imbricating . . . . . *Gekkonidae*  
 Tongue long and slender, deeply forked, retractile into a sheath; back with rounded scales, nonimbricate . . . . . *Varanidae*

## FAMILY GEKKONIDAE

Eight genera of the Gekkonidae are represented in the fauna of Ceylon. Some fourteen other genera occur in Asia, a few of which are known in India. In most cases the genera known to occur in Ceylon also occur in India and often the same species is found in both areas. The genera *Lepidodactylus* and *Peropus* are exceptions, neither being known in India. I suspect that India received *Hemiphyllodactylus* from the same outside source, as did Ceylon.

## KEY TO THE CEYLONESE GENERA OF GEKKONIDAE

1. Digits bent at an angle, and not or but little dilated . . . . . 2  
 Digits not bent at an angle, and more or less dilated . . . . . 3
2. Pupil round; small adult lizards under 40 mm. . . . . *Cnemaspis*  
 Pupil vertical; larger, adult lizards more than 40 mm. . . *Gymnodactylus*
3. Dorsal scales imbricate . . . . . *Lophopholis*  
 Dorsal scales not imbricate . . . . . 4
4. A lateral cutaneous flap or expansion on sides of body; claws on all digits . . . . . *Cosymbotus*  
 No lateral cutaneous flap; digits variable . . . . . 5
5. Terminal phalanges of four outer digits joined to the dilated terminal portion and not arising angularly . . . . . *Lepidodactylus*  
 Terminal phalanges of four outer digits free, rising angularly from the dilated portion . . . . . 6
6. Inner digit well developed, with terminal phalanx clawed; lamellae under toes distinctly divided . . . . . *Hemidactylus*  
 Inner digit variable without or with only a very small claw . . . . . 7
7. Inner digit well developed, lacking a free terminal phalanx, the claw small and often concealed; lamellae divided . . . . . *Peropus*  
 Inner digit represented by a vestige without a free terminal phalanx, clawless or with a minute claw; lamellae, part divided, part single . . . . . *Hemiphyllodactylus*

## Genus GYMNODACTYLUS Spix

*Gymnodactylus* Spix, Specimen novum Lacerta Brasil., 1825, p. 17, pl. 17, fig. 1 (type of genus *Gymnodactylus geckoides*).

This genus which has its greatest development in South Asia, the East Indies and the Philippines has four representatives known in Ceylon, two of which *Gymnodactylus triedrus* and *Gymnodactylus frenatus* are endemic. The latter species is the largest of the genus in Asia, perhaps in the entire range. *Gymnodactylus collegalensis* on the other hand is one of the smallest species of the genus.



Deraniyagala has recently described a species, *Gymnodactylus yakhuna* from the Island.

KEY TO CEYLONESE SPECIES OF GYMNOACTYLUS

1. Body above with small equal granules; no femoral pores . . . . . 2  
Granules on back intermixed with numerous larger keeled or rounded tubercles; femoral pores present . . . . . 3
2. Smaller, 40 mm.; the dark bands on body equal to or shorter than the light interspaces; dark spots subrectangular, in two transverse rows on body; a large, curving, dark, occipital spot; black dots abundant on light interspaces; a few feebly enlarged subcaudals . . . . . *yakhuna*  
Larger, adults, 50-53 mm.; head flecked or dimly spotted; a pair of occipital spots; neck and body with seven pairs of black spots, bordered by lighter brown, or tan; tail, dorsally with a few dark, transverse flecks, ventrally with seven or eight black bars, separated by cream spots . . . . . *collegalensis*
3. Granules of back intermixed with larger, keeled, trihedral tubercles; three or four femoral pores; length, snout to vent, to 65 mm. . . . . *triedrus*  
Granules of back intermixed with large, rounded tubercles; males with four to six preanal pores . . . . . *frenatus*

*Gymnodactylus collegalensis* Beddome

*Gymnodactylus collegalensis* Beddome, Madras Month. Journ. Med. Sci., vol. 2, 1870, p. 173 (type locality, Balarangams, near Yelandur, Mysore, India); Smith, The fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 56-57, pl. 1, figs. B1, B2.

*Gymnodactylus nebulosus* (part.) Boulenger, the Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1895, pp. 64-65; Annandale, Spolia Zeylanica, 1906, p. 189 (18 mi. N. Kandy) Deraniyagala, Ceylon Journ. Sci., B., vol. 16, 1932, p. 293, pl. 59.

**Diagnosis:** A small species, snout-to-vent length 54 mm.; tail 36; limbs short, the leg not reaching axilla; scales on dorsum small uniform except for a few on distal part of flanks and on back between hind legs; no preanal or femoral pores; more than 50 rows of subcircular ventral scales, not or but scarcely imbricating; whorls on tail scarcely discernible, each with six rows of small scales and without larger spiny scales.

**Description of species:** (From E.H.T.-N.M.S. No. 30483, 12-16 mi. N Trincomalee, Ceylon.) Rostral 2.2 mm. wide, 1.5 mm. high; nostril surrounded by rostral, internasal, and three or four postnasals, the first labial excluded; scales on snout rather irregular, much larger than on occiput, distinctly larger than dorsal granules; rostral bordered by four nearly equal-sized scales; the internasals widely separated; ten supralabials, six to a point below middle of



orbit; infralabials, 9, 8; forty granules across head between the edges of eyelids; granules uniform on dorsum and sides except for about 20 scattered, larger, conical tubercles on flanks and between hind limbs; mental relatively small, its labial border equal or a little less than the labial border of rostral; a median pair of postmentals, their common suture longer than the suture of one with the mental, each touching one labial; second pair of postmentals small, touching first and second labials; two or three rows of scales nearest labial series somewhat enlarged; scales on chin granular, subconical; scales on venter granular, subconical, not imbricating, about 58 rows on ventral surface, not differentiated from adjoining lateral scales; scales of preanal region larger, flattened, somewhat imbricating, lacking trace of femoral or preanal pores; tail showing whorls, each with about six transverse rows of flattened scales, all more or less imbricating, their surfaces finely striated or corrugated; on under surface of tail scales slightly larger, the median row not distinguishable from adjoining scales; no larger tubercles on tail; fingers slightly angular, the distal half scarcely narrower than proximal; scales on basal portion enlarged at least one half to two thirds of width of digit and extending onto palm; the formula of scales from claw to base of fingers one to five is: 7, 11, 12, 12, 11; one or more scales may be divided; scale formula for toes: 8, 12, 16, 14, 14, with certain ones divided; hind leg reaches to within one millimeter of axilla.

*Color:* Rich brown, with head flecked or dimly spotted with darker color and a pair of distinct spots on occiput; neck and body with seven pairs of small irregular black spots, bordered with much lighter brown; upper and lower labials cream, with blackish brown spots; chin cream with a series of brown, vermiform flecks or spots; belly dirty white, with some scattered pigment; tail with a few dark, transverse flecks; under surface of tail with seven or eight black bars separated by cream spots; sides nearly uniform brown.

*Measurements in mm.:* Snout to vent, 45; tail, 37; arm, 16; leg, 20.2; axilla to groin, 22.5; width of head, 10.6; length of head, 13.

*Remarks:* All specimens of this species in the collections were found along the beach north of Trincomalee (12-16 mi.) under masses of coral and about a plant, *Zanzeveria zeylanica*, growing in sand and coral along the beach. Here they are very inconspicuous. They are seemingly confined to regions of low elevation in Ceylon. The species is known to occur also in southern India.



DATA ON *GYMNODACTYLUS COLLEGALENSIS*, FROM CEYLON\*

Number.....	30466	30484	30475	30454	30471	30470	30467	30482	30483	30470
Sex.....	♂	♀	♀	♀	♀	♂	♂	♂	♂	♂
Length.....	53	52.3	52	51	50	46	45	44	44	41.5
Tail.....				35.5	32.5				38	
Head, long.....	15.3	16	15	16	16	14.2	15	14.3	14.4	14
Head, wide.....	11	11	10.5	10.3	10	10	9.2	10	10	9
Axilla to groin.....	29.2	27	27	27	25	23	22.5	19	22	20
Arm.....	17.5	17.5	17	16	17.6	16	15.2	16	16	16
Leg.....	22	21.5	21.5	21.5	21.5	20	20	20.3	21.4	18.5
Supralabials.....	9-9	11-11	10-10	9-9	9-9	10-9	10-11	10-10	9-9	11-12
Infralabials.....	8-9	8-9	9-10	9-9	9-9	8-8	9-8	8-7	8-9	9-9

\* All specimens from 12 m. N Trincomalee, Ceylon, in E. H. Taylor-H. M. Smith collection.

*Gymnodactylus yakhuna* Deraniyagala

*Gymnodactylus yakhuna* Deraniyagala, Proc., 32dn. Indian Science Congress, III, (Abstracts) 1945, p. 114; Spolia Zeylanica, vol. 24, part 2, Dec. 22, 1945, pp. 100-102 (type locality, Kalivila, Northwestern Province, Ceylon) ("forma typica").

?*Gymnodactylus yakhuna* variety *zonatus* Deraniyagala, Spolia Zeylanica, vol. 24, pt. 2, Dec. 22, 1945, p. 101 (type locality, Manampitiya, Ceylon).

I am somewhat confused by the recent treatment of a small species of *Gymnodactylus* by Deraniyagala. It is described as *G. yakhuna*. Concerning it, Deraniyagala states: "—The Ceylon gecko also exists as two color varieties, and it is possible that further examination might reveal them to be subspecifically distinct. To be in keeping with the procedure adapted for *Gymnodactylus collegalensis* [by Smith 1935, pp. 56-57, pl. 1, figs. B1, B2] it is now proposed to designate the spotted variety as the 'forma typica' and confer the name of *zonatus* upon the banded one."

I presume that the form previously recorded as *G. collegalensis* occurring in Ceylon is regarded as a synonym of *G. yakhuna*. Unfortunately I have not been able to examine specimens of this latter species (or the color varieties) and cannot judge the merit of distinguishing these from *collegalensis* by name. Nevertheless, it would appear that a species differing from *yakhuna* occurs on the east coast, and this is recognized in this paper as *G. collegalensis*.

*Diagnosis:* Head rather heavy; snout slightly longer than distance between eye and ear; body and tail subcylindrical; no lateral fold; middle of tail as thick as neck; limb short; supralabials, 10-9, infralabials, 9-7; rostral subrectangular touching two supranasals that are separated by a single median scale; dorsal granules rounded,



sometimes two or three enlarged ones on each side near the hips; mental subpentagonal followed by two enlarged postmentals that are broadly in contact with one another mesially; ventrals subimbricate, some apt to be subhexagonal in shape; caudals and subcaudals imbricate, a few may be somewhat enlarged; subdigital lamellae equal to half width of basal part of digit; head with an arrow-shaped, dark, median band which is interrupted in many specimens, and there are three or four supraocular dark blotches. A dark band runs laterally from snout to nape, and is confluent with its fellow; ventrally dusky gray; throat with a number of wavy dark lines running from lips to the midgular region. (Data from Deraniyagala.)

*Remarks:* That *Gymnodactylus yakhuna* differs materially from specimens at hand that I have designated *Gymnodactylus collegalis*, is obvious. The specimens of the latter are larger, fully-grown adults, ranging from 45 to 53 mm., snout to vent, and none in my series displays the type of coloration recorded for *yakhuna*. Specimens referred by me to *collegalis* are all from 12-16 miles north of Trincomalee along the shore in Eastern Province, but at a point probably as far north as the type locality of the variety *zonatus*.

The differences in the two color varieties are: *Forma typica*—there are two crossrows of dark blotches on the body, each row consisting of two subrectangular markings. *Zonatus*—there are two crossbands on the body, which are equal to or shorter than the light interspaces.

### *Gymnodactylus triedrus* Günther

*Gymnodactylus triedrus* Günther, Reptiles of British India, 1864, p. 113, (type locality, Ceylon); Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, p. 38; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 67-68; Annandale, Jour. Asiat. Soc. Bengal, vol. 73, 1904, Suppl. p. 13; Rec. Ind. Mus., vol. 9, 1913, p. 320; Deraniyagala, Ceylon Journ. Sci., B, Vol. 16, 1932, p. 295-296, pl. 61; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 55-56.

*Geckoella punctata* Gray, Proc. Zool. Soc. London, 1867, p. 99, pl. 9, (type locality, Ceylon).

*Diagnosis:* A large *Gymnodactylus*, the snout-to-vent measurement 62 mm.; tail 56 mm.; 12-13 supralabials, 10-11 infralabials; venter with 35 rows of cycloid, imbricating scales; body with small granular scales mixed with larger, rounded, keeled, or trihedral tubercles; toes short, the lamella on basal part scalelike, half as wide as the digit; tail with small rounded imbricate scales, those on under surface somewhat larger; three or four femoral pores.



Brown on dorsum; numerous white spots with darker edges usually present; light brown on venter.

I have not examined this species. It is endemic in Ceylon, and has not been taken elsewhere.

*Gymnodactylus frenatus* Günther

*Gymnodactylus frenatus* Günther, Reptiles of British India, 1864, p. 113, pl. 12, fig. D. (type locality, Ceylon). Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 1, 1885, p. 42; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 68; Annandale, Spolia Zeylanica, vol. 3, Jan. 1906, p. 190 (Kandy); Henry, Ceylon Journ. Sci., B, vol. 16, 1928, p. 339; Deraniyagala, Ceylon Journ. Sci., B, 1932, pp. 294-295, pl. 41; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, p. 49; Bhatt, Animal Life (Colombo Ceylon) 1942, pp. 122.

*Diagnosis:* A large lizard (head-body length 100 mm., tail 120 mm.) with dorsal scales granular, intermixed with large rounded tubercles; tail with flat scales, the basal whorls with four somewhat enlarged rounded tubercles, quickly becoming smaller on succeeding whorls; male with four to six preanal pores; 33-35 scales across belly; four or five large dark bands whose anterior and posterior borders form angles.

*Description of species:* (From K.U.M.N.H. No. 31258, Tonacombe Estate, Namunukula, Ceylon). A large species, the head (20 mm.) nearly as wide as long (21.5 mm.); snout-to-vent length 85 mm., tail, broken from body, the tip regenerated, 87 mm.; rostral large, its width (4.7 mm.) greater than its height (2.3 mm.), a median entrant suture more than half height of scale, the upper edges curving toward middle; internasals large, separated by a median scale and followed by one somewhat enlarged; nostril surrounded by rostral, first labial, two or three postnasals and the internasal, the latter almost excluded; scales on snout variable in size in several areas; fifty scales across snout between the fourth labials; a depression somewhat behind nostrils and a well-defined median depression beginning at about posterior level of orbits and extending onto frontal region, narrowing between orbits; approximately 48 scales between outer edges of eyelids at middle of orbit, small, irregular with a few larger flat rounded tubercles intermixed; supralabials, 9-10; infralabials, 8-8; scales adjoining labials somewhat enlarged, at least anteriorly; mental border on lip greater than rostral border, the sides of mental being nearly straight, forming approximately a right angle posteriorly. A pair of postmentals forming a median suture as long as their sutures with mental, bordering first labial for about half its length; on each side a small outer postmental touching two labials; two or three scales follow-



ing somewhat enlarged; chin scales small, circular, rather regular; ear diameter less than half eye diameter; distance from ear to eye a little greater than distance from eye to nostril; ventrolateral folds more or less distinct; scales of occiput and dorsum small, with about 14 irregular, longitudinal rows of larger rounded, flat, rarely slightly keeled, tubercles; the three or four basal whorls of tail may have as many as six tubercles, but reduce posteriorly to scales that are not or scarcely differentiated; 6 transverse rows of small scales on each whorl; on ventral surface two widened scales to each whorl; abdominal scale rows, 30-33, cycloid, imbricate; an enlarged row of femoro-preanal scales the inner two of the series bearing preanal pores in the male, separated by three scales mesially; males with three enlarged flattened tubercular scales on each side of tail base; bases of angular digits widened, bearing single, transverse lamellae, 7 to 9 in number; on both hands and feet lamellae continue below metacarpals and metatarsals for some distance; all digits clawed; hind leg long, reaching axilla when adpressed.

*Color:* Above gray, the top of head with small spots or marbling of brown; a light-edged, brown band from behind each eye unites with a dorsal brown spot on beginning of neck; three brown W-shaped blotches on back of body which are separated by gray bands with some indefinite brown flecks; arms and legs banded or mottled; tail with regular broad bands of brown or black; grayish below on chin and venter, everywhere peppered with black pigment.

*Remarks:* The single specimen at hand is from an elevation of 4000 ft. on the Tonacombe Estate, Namunukula, Ceylon (Uva Hills), W. W. A. Philipps, collector.

The species is endemic in Ceylon and has not been taken elsewhere.

#### Genus CNEMASPIS Strauch

*Cnemaspis* Strauch, Mem. Acad. St. Petersburg, vol. 35 (7), 1887, p. 41 (type of genus, *Cnemaspis boulengeri*).

This genus is represented by at least four forms in Ceylon. Certain of these are regarded as variable and Malcolm Smith (1930) throws some doubt on the validity of certain forms recognized by Deraniyagala and Boulenger. Probably the last word cannot be said on the matter until rather large series are available from various parts of Ceylon and south India. Only then can one properly evaluate the differences in populations. It seems likely that size of the animals may be a specific character. Measurements offered by Smith for *kandiana* are considerably greater than any specimens in my series of thirteen. Whether the forms here con-



sidered are to be regarded as species or subspecies will depend on more material than has been collected. I have regarded them as of specific rank, but without conviction.

#### KEY TO FORMS OF CNEMASPIS IN CEYLON

1. Femoral pores less than five (rarely five) median subcaudals not strongly enlarged . . . . . 3  
     Femoral pores five or more; median subcaudals much enlarged . . . . . 2
2. Femoral pores eight to fifteen . . . . . *jerdoni*  
     Femoral pores eight or less . . . . . *podihuna*
3. No keeled scales on ventral neck region or abdomen; femoral pores three or four; preanal pores two to four . . . . . *gracilis*  
     Keeled scales on ventral neck region or on both neck and abdomen . . . . . 4
4. Ventral nuchal scales keeled over a greater or lesser area; abdominal and subcaudal scales smooth; femoral pores, three to five; preanal pores, two to four . . . . . *kandiana*  
     Keeled scales on entire nuchal, ventral and ventrolateral areas, as well as under tail; femoral pores 3; preanal pores absent (in specimen examined) . . . . . *tropidogaster*

#### *Cnemaspis podihuna* Deraniyagala

*Cnemaspis podihuna* Deraniyagala, Journ. Royal Asiat. Soc. (Ceylon branch) no. 97, 1944, pp. 226-227, 1 fig. (type locality).

? *Gymnodactylus scalpensis* Ferguson, Reptile Fauna of Ceylon, Colombo, 1877, pp. 1-30.

**Diagnosis:** Femoral pores five; preanal pores four; subcaudal scales strongly enlarged; tail with small lateral spines; some enlarged lateral spinelike scales on the sides; nine supralabials; six or seven infralabials.

I have not examined specimens of this species. It appears to be closest to *Cnemaspis jerdoni*. The type locality of the latter is unknown. Ferguson has described a form from Ceylon (without specific locality) which he named *scalpensis*. Unfortunately the type is lost. There is a possibility that *podihuna* is a synonym of *scalpensis*.

#### *Cnemaspis jerdoni* (Theobald)

*Gymnodactylus jerdoni* Theobald, Catalogue of the Reptiles in the Asiatic Society Museum, 1868, p. 31 (type locality not stated, India by inference).

*Gonatodes jerdoni* Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, p. 71; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 78. Deraniyagala, Ceylon Journ. Sci. B, vol. 16, pt. 3, 1932, pp. 298-299.

*Cnemaspis jerdoni* Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 74-75.

**Diagnosis:** This species is similar to *gracilis* in general scale characters: the postmentals two or three; tail cylindrical; median subcau-



dal scales larger than others. A series of five to fifteen femoral pores on each side; ventral scales cycloid, smooth. Gray brown clouded with darker. Small lateral spines white, sometimes a black spot on back of occiput; "Snout to vent, 40 mm., tail 44 mm."

*Cnemaspis gracilis* (Beddome)

*Gymnodactylus gracilis* Beddome, Madras Month. Journ. Med. Sci., vol. 1, 1870, p. 32 (type locality, Palghat Hills, Madras, India).

*Gonatodes gracilis* Boulenger, Catalogue of the Snakes of the British Museum, vol. 1, 1885, p. 70, pl. 6, fig. 5; The Fauna of British India, including Ceylon and Burma, 1890, p. 78; Hora, Rec. Indian Mus., vol. 28, part 3, 1926, pp. 191-192, pl. 7, fig. 7, test fig. 3 a. (Indian Records only).

*Gonatodes kandianus gracilis* Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1932, p. 297.

*Cnemaspis gracilis* Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia vol. 2, Sauria, 1935, p. 74. (Hills of Ceylon) ("Doubtfully distinct from *kandianus* perhaps only a varietal form not correlated with geographical distribution").

**Diagnosis:** This form differs from the species *kandiana* in having two instead of three scales bordering the mental. Scales on the neck are larger, smooth, lacking keels; scales under basal part of foot smaller; grayish or brownish above, the back of occiput with darker spots; sometimes a series of light vertebral spots present. A forest form.

*Cnemaspis kandiana* (Kelaart)

*Gymnodactylus Kandianus* Kelaart, Prod. Fauna Zeylanicae 1852 (1853), p. 186 (type locality, "Kandian-hills", [hills about Kandy, Ceylon]); Günther, Reptiles of British India, 1864, p. 114.

*Gymnodactylus humei* Theobald, Cat. of the Reptiles of British India, 1865, p. 89, (type locality, Kandy, Ceylon).

*Gonatodes kandianus* Boulenger, Catalogue of the Lizards of the British Museum, vol. 1, 1885, p. 68; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 77-78; Hora, Rec. Indian Mus. vol. 28, pt. 3, 1926, pp. 191-193 (Kandy and Peradeniya, Ceylon). "*G. kandianus* possesses a relatively longer and more pointed snout and three chinshields behind the mental".

**Diagnosis:** Small geckoes, the maximum snout-to-vent length approximately 40 mm.; tail, 45 mm.; fingers slender, the basal portion of digits with a few enlarged, flat plates; femoral pores few, widely separated from a small series of two or three preanal pores; scales on back small, somewhat keeled granules, with some scattered larger ones; on flanks, scales prominent, spinelike; belly scales imbricate; those on neck with fine keels.

**Description of species:** (from E.H.T.-H.M.S. No. 30517). Rostral (1.5 mm. x 9 mm.) reaches above level of nostril, which is surrounded by rostral, two postnasals and an internasal (the first labial being excluded), and the internasal forming a very small contact; latter scales separated mesially by a scale nearly as large



as internasals but extending somewhat farther forward (in this specimen, partially fused to rostral); seven or (eight) supralabials, the fourth extending under front of orbit; between front part of fourth labials across snout, 28 relatively large scales; scales bordering labials not larger than snout scales; infralabials, 8-8; mental very large, its labial border considerably greater than labial border of rostral; a pair of chinshields separated mesially by a much smaller scale; second chinshields smaller, separated by three intervening scales all larger than other chin scales which are keeled on side of jaws; scales on sides of neck larger, with keels, the keeled extending on sides of neck to arm insertion; scales of venter somewhat cycloid, imbricate, smooth, in 24 rows; scales on sides keeled, while on back they are smaller, almost trihedral, with a few larger pointed scales often elevated to resemble small spines; tail with small scales arranged in eight rows to a whorl, each whorl bearing two small pairs of dorsal spines and one lateral pair; a very heavy pyramidal scale at base of tail on each side; tail regenerated (ventrally, on original tails, three scales to a whorl, every third scale being somewhat enlarged); four femoral pores placed ventroposteriorly; two preanal pores separated from femoral pores by seven or eight scales; digits with a long slender distal part and a widened basal part except on first inner finger and toe where the free basal part is missing; on basal part of four outer fingers, there are four or five widened flat scales; on toes five or six; a single large scale at base of first finger and toe; ear about one third of eye diameter; the distance between ear and eye more than a third less than distance from eye to nostril.

*Color:* Above dark, gray-brown with some blackish flecks tending to form a transverse band; pigment on ventral surface often arranged in half-moon groupings on posterior edges of scales; chin and throat dark (at least in males); tail indistinctly barred (when complete, the dark marks narrow).

*Measurements in mm.:* Snout-to-vent length, 31; tail regenerated; width of head, 5.45; length of head, 9.

*Remarks:* The following specimens have been examined: E.H.T.-H.M.S. Nos. 30514 Kandy; 30515-30518 Badulla; K.U.M.N.H. Nos. 31265-31275 Tonacombe Estate, Namunukula, 4000 ft. elevation, in Uva Hills.

The largest of this series of specimens measures only 31 mm. snout to vent; tails for the most part are incomplete or reproduced. No. 30514 measures 25 mm., the tail being 32 mm.

One of the specimens has only a single preanal pore, and four



femoral pores. Those from Tonacombe Estate have a curving, light gray line from eye around occiput to eye, bordered anteriorly by a darker mark; mesially on occiput there is a lighter spot; behind this there is a curving darker spot; some specimens show eight or nine transverse bars on body, the dark bars being somewhat angulate or W-shaped.

*Cnemaspis tropidogaster* (Boulenger)

*Gonatades kandiamus tropidogaster* Boulenger, Catalogue of the lizards in the British Museum, vol. 1, 1885, p. 70 (type locality, Ceylon); The Fauna of British India including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 78.

*Diagnosis:* Entire ventral surface of throat, venter and under side of tail strongly keeled; ventral scales under tail all relatively small, more or less equal in size; three femoral pores; no preanal pores (?).

*Description of species:* (From E.H.T.-H.M.S., No. 30246 Galle, Ceylon.) The form agrees in certain characters with *kandiana* but differs in the character of the squamation; 24 mm. snout-to-vent (tail broken and posterior part missing); nostril surrounded by rostral, an internasal and two postnasals; pair of internasals separated mesially by one scale; 29 scales across snout between fourth labials; supralabials, 7-7; infralabials, 7-8; approximately 42 scales across head between edges of eyelids at middle of orbit; scales on snout larger than on occiput, rather equal and regular; granules much finer on occiput; on body, scales nearly as large as those on snout, but keeled or trihedral with a few larger, scattered, irregularly placed tubercles; scales on arms and legs, as well as on sides and ventral surfaces, keeled, except for a few in preanal region; median scales under tail pointed, keeled and subequal, but little larger than other subcaudals, which are all strongly keeled; scales above arranged in whorls, each whorl with eight or nine rows of keeled scales and a transverse series of large pointed spines, six at least on basal whorls; a very heavy, spiny tubercle on each side at base of tail; a few lateral spines present.

Distal part of fingers compressed, the basal part wider, bearing three or four flat scales on four outer fingers; one at base of the compressed part of first finger; four or five scales under four outer toes, one under first toe; hind leg brought forward, the toes touch axilla (skin damaged so no count of abdominal scales can be made); three femoral pores; I cannot discern preanal pores.

*Color:* Brown or gray-brown above; a pair of irregular occipital dark spots with a lighter cream spot between them; some darker clouding on back and sides, the median region a little lighter.

*Remarks:* Most records of *Cnemaspis tropidogaster* are from low-







*Hemidactylus brookii* Gray

*Hemidactylus brookii* Gray, Catalogue of the Specimens of Lizards in the collection of the British Museum, 1845, p. 153 (type locality, Borneo); Boulenger, Catalogue of the Lizards of the British Museum, vol. 1, 1885, p. 128; Deraniyagala, Ceylon Journ. Sci., B, 16, 1932, p. 300.

*Hemidactylus gleadowii* Boulenger, The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 86, 87, fig. 27.

*Hemidactylus maculatus*? Kelaart, Prod. Fauna Zeylanica, 1852 (1853) p. 158 (Ceylon, widely distributed) (not of Duméril and Bibron).

**Diagnosis:** A small, widespread species with a maximum snout-to-vent length of 60 mm., the tail approximately 78 mm.; femoro-preanal pores, 11-15; scales of tail in whorls, each bearing eight or six sharp, spiny tubercles; back with 18-22 rows of trihedral tubercles; scales across abdomen cycloid, imbricate, 36-40 in number.

**Description of species:** (From E.H.T.-H.M.S. No. 30417.) A rather small species, the head-width in head-length, 1.5 times; diameter of ear distinctly less than half of eye-opening, its distance from eye a little less than distance between eye and nostril; width of rostral, 2.1 mm., height, 1.45 mm.; a median, entrant suture less than half height of scale; a pair of internasals separated by a pair of median scales; nostril surrounded by rostral, first labial, three postnasals and an internasal; scales on snout regular, with some variation in size, all scales larger than elsewhere on head and dorsum (exclusive of tubercles); 37 scales across snout between the fourth supralabials; approximately 43 scales between edges of upper eyelids; scales on head minute, the small intermixed tubercles reaching forward to anterior level of eye; scales of sides and dorsum small, juxtaposed, intermixed with trihedral tubercles, forming approximately 20 irregular, longitudinal rows, but diagonally the rows are relatively regular; nine or ten rows between hind legs; scales on tail arranged in whorls, seven or eight scale-rows basally to a whorl, with a transverse series of eight large spiny scales (at base) and reduced to six and later to four farther back; ventral scales on the base of the tail divided, becoming single on the fifth whorl, two scales to a whorl; the regenerated tail has very wide, ventral scales, while the scales of side and dorsal part of tail are nearly uniform and more or less keeled; a number of large tubercles on dorsal surface and hind limb; supralabials, 11-10, infralabials, 9-9; mental with a wider labial border than rostral, its sides straight, forming an acute angle behind; two pairs of chinshields, the inner, larger pair with a suture much less than half that bordering the mental, the scales touching two labial scales; outer pair smaller, touching only one labial; chin scales small, regular, cycloid, a little larger on sides; venter with larger cycloid, imbricate scales, in 38



rows at widest part of belly; a rather large tubercular scale on each side of base of tail; preano-femoral pores, 13-13, separated mesially by three scales; ventrolateral folds scarcely discernible. All digits with claws, and lamellae under basal part; terminal lamellae, fore and aft, are single, others double, arranged slightly diagonally, seven or eight on outer four toes, five on inner toe; six or seven on four outer fingers, five on inner finger, the proximal lamellae on all somewhat scalelike.

*Color:* Above fawn with a series of brown flecks or spots on head and a curving mark from back of eye around to back of eye on opposite side; a dark line directly back from eye to behind ear; dorsum with three moderately distinct series of spots, one series medial, the others dorsolateral; venter yellowish white; tail indistinctly barred.

*Remarks:* A series of specimens of this species (E.H.T.-H.M.S. Nos 30401-30417) was acquired at a point 12 to 14 miles north of Trincomalee. Most of these were collected in human habitations. One other specimen, No. 30486, E.H.T.-H.M.S. from "Ceylon," is in the collection.

There is considerable variation in color and markings, dependent on the amount of pigment. Specimens taken and preserved at night are light in color.

### *Hemidactylus depressus* Gray

*Hemidactylus depressus* Gray, Zoological Miscellany, 1842, p. 58 (type locality unknown: here restricted to Ceylon); Catalogue of the Specimens of Lizards in the collection of the British Museum, 1845, p. 153; Günther, Zoology of the Erebus and Terror, vol. 2, 1874-75, p. 16, pl. 15, fig. 1 (figure of type) [not seen by me]; Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed. vol. 1, 1885, p. 134; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 76; Boulenger, The Fauna of British India, including Ceylon and India; Reptilia and Batrachia, 1890, p. 90-91; Haly, First Report on the Collection of Lizards in the Colombo Museum, 1886, p. 4, (Colombo, Ceylon); Méhely, Termes Füzet., vol. 20, 1897, p. 57; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1932, p. 302, pl. 58.

*Nubilia argentii* Gray, Catalogue of the specimens of Lizards in the collection of the British Museum, 1845, p. 273 (type locality "Singapore", *ex errore*, corrected to and restricted to Ceylon).

*Hemidactylus pieresii* Kelaart, Prod. Fauna Zeylanica, vol. 1, 1852 (1853), p. 159 (type locality, Kandy, Ceylon ["The Kandian Gecko"]).

*Diagnosis:* Head moderately wide the maximum snout-vent length reaching 80 mm., the tail 90; scales across belly, 35; 15 to 17 femoral pores on each side, almost continuous; back with fine granules and 16 (14-18) irregular rows of trihedral tubercles; scales of tail in whorls, each whorl bearing 8 spinelike tubercles; a cream line from eye to nostril.



*Description of species:* (from E.H.T.-H.M.S. No. 30399). Head one and one-half times as long as wide; rostral nearly twice as wide as high, reaching distinctly higher than upper level of nostril; a pair of internasals separated mesially by two small scales (tandem); two, small, indistinct postnasals, one supralabial, the rostral and internasal complete the border of nostril; 38 small granular scales from eyelid edge across to eyelid edge at middle of eye; 48 scales from fifth labial across snout to fifth labial; scales on snout larger on interorbital area and occiput, but in latter area larger scattered scales are present; ear large, diagonal, its greatest diameter a little more than half eye diameter; ear a little closer to eye than nostril; supralabials 13-13, infralabials 10-10; scales bordering labials scarcely larger than other scales; width of mental about equal to that of rostral, the sides of mental forming an angle; first pair of postmentals touch two labials, forming a common suture as long as their sutures with the mental, the scales nearly pointed behind; outer pair of postmentals touch one labial and are very narrowly separated posteriorly, the third scale on each side being separated from the third labial by another small scale; scales on chin and throat small, nearly uniform; on belly, scales cycloid, imbricate, about thirty-six rows between indistinct dorsolateral folds; femoro-preanal pores, 17-17, separated mesially by three scales; terminal (anterior and posterior) lamellae single; other lamellae paired, arranged slightly diagonally; outer fingers with eight or nine lamellae; inner finger with six; four outer toes with nine or ten lamellae, the inner toes with six lamellae; tail with numerous whorls, bearing at base eight spiny tubercles and seven or eight rows of tiny scales; ventrally each whorl with two enlarged scales.

*Color:* Above light gray or brownish gray; a silvery or cream line from eye to nostril, dark bordered above and below; a black stripe from eye to near point of arm insertion and a short upward projection from it behind ear; back gray-brown with four narrow transverse markings.

*Measurements in mm.:* Snout-to-vent length, 69; tail length, 73 (tip regenerated); width of head, 15; length of head, 21; axilla to groin, 36; arm, 19; leg, 26.

*Remarks:* A series of eleven specimens have been examined: E.H.T.-H.M.S. Nos. 30393-30400 from 12 miles north of Trincomalee Ceylon; Nos. 31255-31257, 31287 Tonacombe Estate, Uva Hills, Namunukula Ceylon, W. W. A. Phillips, collector.



*Hemidactylus triedrus* (Daudin)

*Gecko triedrus* Daudin, Histoire Naturelle générale et particulière des Reptiles, vol. 4, year X (1802) pp. 155-157 (unknown locality; here fixed and restricted to Trincomalee, Ceylon).

*Hemidactylus triedrus* Kelaart, Prod. Faun. Zeylanica, 1852, p. 157; Günther, Reptiles of British India, p. 107; Boulenger, Catalogue of the Lizards of the British Museum (Natural History, 2nd ed., vol. 1, 1885, p. 133; Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 89-90; Méhely, Termes Füzet., vol. 20, 1897, p. 57. (Kala-Wewa; tubercular scales in 18 rows; femoral pores 7-7); Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1932, p. 303, pl. 44; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 88-89.

*Hemidactylus trihedrus* Kelaart, Prod. Faun. Zeylanicae, 1852 (1853), p. 157, (rare in Ceylon; found in ant hills at Trincomalee; it lays 3 to 6 eggs.)

*Diagnosis:* Large, snout-to-vent length, 80 mm., tail 90 mm.; trihedral tubercles arranged in 16 to 18 longitudinal rows; femoral pores, 8-8, separated by a single scale, mesially.

*Description of species:* (from E.H.T.-H.M.S. No. 30418.) Head moderate, its length, 1.6 times the width; height of rostral, reaching upper level of nostril slightly more than half its transverse width; internasals separated mesially; nostril surrounded by rostral, internasal, first labial and three postnasals; supralabials, 10-10; infra-labials, 8-8; 37 scales across snout between the fourth supralabials; scales between edges of eyelids, 47, extremely minute but with a few larger tubercles scattered in this region and on occiput; scales on dorsum and sides distinctly larger than those on occiput, but smaller than those on snout; trihedral tubercles especially large, measuring 1.5 mm. in length and width, and .5 mm. high, these separated from each other by from one or two rows of small scales; approximately 24 longitudinal rows of scales on venter, the ventro-lateral folds being nearly obsolete; scales on chin subequal, very small; mental large its labial border much larger than labial border of rostral; first pair of postmentals touching one labial, forming a median suture much shorter than their suture with mental; outer (second) pair of postmentals small, widely separated, touching two labials; third outer postmentals touching second and third labials; auricular opening distinctly more than half length of eyes; preanal pores, 8-8, separated mesially by a single scale, and scarcely extending onto femora. All fingers with claws; second joint of fingers and toes with lamella, the distal and sometimes proximal lamellae of series single, others double, arranged diagonally; four outer fingers with eight, inner finger with six lamellae; four outer toes with eight, inner toe with seven lamellae; terminal joint arising back from edge of lamella, the joint long; scales of tail in whorls, bearing either six (on basal whorls) or four, large trihedral tubercles; about nine rows



of small scales to each whorl; a pair of broad scales on ventral surface of each whorl.

*Color:* Above rather light, brownish-fawn, with six or seven very indistinct, transverse, darker spots, the posterior ones scarcely discernible; on edges of these spots several cream-colored trihedral tubercles; behind eye a dark stripe, bordered by three or four cream tubercles above, and below, behind this, a single row of cream tubercles extending along neck and on side, with others on back; tail nearly uniform brown (banded in young).

*Remarks:* I have three specimens, E.H.T.-H.M.S. Nos. 30418-30420 taken 12-15 miles north of Trincomalee, in forest. The largest specimen measures 72 mm. snout to vent; tail, 85 mm. Two specimens in the U.S.N.M., Nos. 120311 ♀ to 120313 ♂ are from Rattota, Matale District.

The two latter specimens differ but little in the characters recorded for the preceding. The male pores are 7-8, separated mesially by two scales.

### *Hemidactylus leschenaulti* Duméril and Bibron

*Hemidactylus leschenaulti* Duméril and Bibron, *Erpétologie générale* vol. 3, 1836, p. 364 (type locality, Ceylon); Boulenger, *Catalogue of the Lizards in the British Museum*, 2nd ed. 1884, pp. 136-137; *Fauna British India including Ceylon and Burma*, Reptilia and Batrachia, 1890, pp. 91-92; Deraniyagala, *Ceylon Journ. Sci.*, B, vol. 16, 1932, p. 301, pl. 43; Smith, the *Fauna of British India*. . . . Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 97-98.

*Hemidactylus coctaei* Kelaart, *Prod. Faun, Zeylanica*, 1853, p. 160, (*nec* Duméril and Bibron).

*Hemidactylus pustulosus* Lichtenstein and von Martens, *Nomenclator Reptilium et Amphibiorum musei zoologici Berolinensis*, 1856, p. 5. (type locality, Ceylon).

*Hemidactylus kelaartii* Theobald, *Journ. Asiat. Soc. Bengal*, extra number 88, 1868, p. 29 (type locality, Ceylon).

This large Indian gecko was found to be common in the lowland forests eastward and northward of Trincomalee. One smooth-barked tree species common in this vicinity, was almost certain to have a family of these lizards, the mottled gray bark rendering the lizard almost invisible. I have found no individuals of this species in human habitations.

*Diagnosis:* Head and body relatively broad for the length; 50 granules across head between eyelids; whorls on tail with 12-14 rows of small scales and two pairs of small flat tubercles; granules on back small with flat rounded inconspicuous tubercles; 17-18 femoral pores.

*Description of species:* (from E.H.T.-H.M.S. No. 30430). A large-headed, large-bodied species, reaching 92 mm. snout-vent



length; tail length, 86 mm. (which is, I believe, the largest recorded specimen); rostral much wider than high, reaching up to level of middle of nostrils; a short groove enters rostral from above; internasals (separated by a minute scale, or often by two or three), a pair of postnasals and one labial helping form nostril rim; upper labials, 9-9, followed by three or four tiny scales; infralabials, 9-8; rows of scales bordering the labials both upper and lower, somewhat larger than other head scales; granules between edges of upper eyelids approximately 50; ear opening large, its diameter about  $2\frac{1}{2}$  times in diameter of eye; its distance from eye a little less than distance from eye to nostril; head, dorsum and sides covered with small, nearly uniform granules although those on front of head larger, irregular; median scales on back somewhat smaller than those on sides, the granules juxtaposed rather than imbricating; a few (two or four), large, rounded, flat tubercles on back between hind limbs; venter covered with cycloid, imbricating scales, approximately 50 between edges of the two slight ventrolateral folds; mental large, its labial border distinctly larger than that of rostral; a pair of median postmentals touching first labials and forming a median suture a little more than half their length; second, outer pair, smaller, touching first and second labials; femoral pores 17-18, separated mesially by six scale rows; tail with whorls, each bearing 12-14 rows of fine, juxtaposed or partially imbricating granules, and dorsally with two pairs of flat rounded tubercles, and dorsolaterally with one flattened spinelike scale; ventral scales widened, two to each whorl; posteriorly the flat rounded tubercles become more pointed and scalelike (tail partly regenerated, this without whorls or tubercles); toes widened with a double series of slightly diagonal lamellae; four outer fingers with eight or nine lamella, first toe with six, the terminal joint arising back from anterior lamella; all fingers with claws; four outer toes with eight or nine paired lamella (the terminal one always single on all digits); inner toe with six or seven lamellae.

*Color:* Grayish or grayish black, with dark indistinct markings forming wavy, crossbars, each lighter anteriorly, darker posteriorly and mesially; tail dark with lighter bands of cream or yellow-white; under side of tail, pigmented; a dark line from eye more or less traceable to groin on the side.

*Measurements in mm.:* Length, snout to vent, 92 mm.; tail length, 86; width of head, 21; length of head, 26; axilla to groin, 39; arm, 29; leg, 36.



*Hemidactylus frenatus* Schlegel

*Hemidactylus frenatus* Schlegel, in Duméril and Bibron *Erpétologie Générale* . . . vol. 3, 1836, p. 366 (type locality, "Java," here restricted to Batavia, Java); Kelaart, *Prod. Faun. Zeylanicae*, 1853, p. 161 ("found in all parts of the Island except in Newera Ellia"); Deraniyagala, *Ceylon Journ. Sci.*, B, vol. 16, 1932, p. 299, pl. 42; Smith, *The Fauna of British India*, including Ceylon and Burma; *Reptilia and Amphibia*, vol. 2, Sauria, 1935, pp. 95-96, fig. 29.

*Diagnosis:* A relatively small species, snout-to-vent length 62 mm.; tail, 70 mm.; preano-femoral pores in a continuous series of 29-33 on each side; two postmentals, the second outer pair nearly as large as inner pair; body with few, scattered, rounded or feebly keeled tubercles chiefly confined to posterior part of body. Tail with whorls, each bearing a series of spinelike scales.

*Description of species:* Rostral nearly a half wider than high; nostril surrounded by rostral, first labial, an internasal and two postnasals; internasals separated mesially by a single scale; approximately 41 scales across head between edges of eyelids; occiput, neck and body covered with minute granules and with one or two scattered rows of rounded tubercles beginning on shoulders or perhaps not extending farther forward than middle of body; sometimes tubercles trihedral.

Tail with 10-12 rows of small scales arranged in whorls, each bearing a series of six larger spinelike scales, the outermost ventrolateral in position, and on ventral surface bearing two enlarged scales, the anterior the larger on each whorl; supralabials, 12-12, the last four very small; infralabials, 9-9; chin scales small, regular, a little larger on the sides; ventral scales cycloid, about 38 to 40 between the ventrolateral folds; however those along sides of venter nearly a half smaller than those in middle; digits with claws; inner digits very small, less than half length of the adjoining digit; lamella, eight to ten on four outer toes, six to eight on four outer fingers, five on inner finger and toe.

*Color:* Grayish or fawn to blackish brown, uniform or with some indistinct marking; usually a dark, light-bordered line on head; yellow or yellow-white below.

*Remarks:* Some specimens may have a pinkish tinge above. The color is changeable and while at night they may be nearly fawn, in daylight they may become blackish.

The species is widespread in South Asia and Indonesia about human habitations. I have not found individuals in forest, away from the proximity of such habitations.

The following Ceylonese specimens are at hand: E.H.T.-H.M.S., Nos. 30433-30463, from 12-14 mi. N of Trincomalee, Ceylon; K.U.



M.N.H., Nos. 31259-31264, Tonacombe Estates, Namunukula, Ceylon. The pore-counts vary from 29 to 33, usually in a continuous series (one exception has the series separated by one scale).

*Hemidactylus maculatus hunae* Deraniyagala

*Hemidactylus maculatus hunae* Deraniyagala, Ceylon Journ. Sci. B. vol. 20, pt. 2, Apr. 15, 1937, pp. 185-189, fig. 1 (type locality, Okanda, Eastern Province, Ceylon).

*Diagnosis:* A large species 105 mm. snout to vent; nineteen to twenty-five femoral pores on each side, separated mesially.

*Description:* Snout obtuse, as long as or longer than the distance from eye to ear; supralabials ten to twelve, the infralabials nine or ten; mental subtriangular, wider than the rostral; and usually as long as wide; postmentals two pairs, the inner enlarged; gular scales fine, granular; rostral subquadrangular, broader than high; nostril between rostral, first labial and several small scales; a pair of internasals; snout with convex scales, the occiput with granular scales and larger conical tubercles; back covered with small scales and about fifteen to twenty longitudinal rows of tubercles, which are smallest along the middorsal line and feebly trihedral; ventrals smooth, imbricate, rounded scales which grade imperceptibly into the laterals posterodorsally, immediately anterior to the hind legs; digits free, moderately dilated with almost straight, transverse lamellae, nine or ten under inner toe, eleven to thirteen under fourth toe; tail feebly depressed, with about sixty wide subcaudals and dorsally with six or four longitudinal series of tubercles which are usually low and subconical, rarely trihedral; males with nineteen to twenty-five femoral pores on each side, separated by from two to sixteen scales.

*Color:* Dorsally silvery gray with five broad transverse olive-brown bands from neck to rump; each band possesses a black margin and forms a rhomboid vertebral enlargement with a light center containing a black ring. Tail with about six dark rings a little wider than the interspaces; limbs with five or six irregular rings on each; two lateral bands on each side of head; ventrally white, dusted with brown especially on tail; young with dorsal crossbands without any light areas.

The type is from Okanda, Eastern Province, Ceylon. It was taken in a rock cave.

*Measurements:* Snout to ear, 28 mm.; snout to vent, 105 mm.; tail length, 115 mm.

Data from the type description.



Malcolm Smith has not included this form in his "Fauna," nor does he list *H. maculatus* from Ceylon.

### Genus COSYMBOTUS Oken

*Cosymbotus* Fitzinger, Syst. Rept. 1843, pp. 19, 104 (type of genus *Stellio platyurus* Schneider); Myers, Copeia, 1943, No. 3, Oct. 15, p. 192.

Two species are recognized. The species, which occurs in Ceylon, is widely distributed in India, Indo-China, and the East Indian Archipelago.

#### *Cosymbotus platyurus* (Schneider)

*Stellio platyurus* Schneider, Amphib. Physiol., vol. 2, 1792, p. 30 (type locality not given [*vide* M. Smith. I have not seen this paper]).

*Hemidactylus platyurus* Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, p. 143; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 95.

*Cosymbotus platyurus* Deraniyagala, Ceylon Journ. Sci., B, vol. 15, 1932, p. 306.

*Platyurus platyurus* Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 102-103.

**Diagnosis:** A medium sized gecko, the snout-vent length reaching 60 mm.; tail 65; digits webbed, broadened, with the lamellae divided below by a deep groove; all digits clawed; a narrow lateral web or fringe on each side of body; males with continuous preanal and femoral pores, 13-20 on each side; nostril between rostral, first labial, an internasal and two postnasals; back with uniform small granules; venter with smooth, cycloid scales; gray or gray-brown above, marbled or with spots, sometimes with large distinct dorsal blotches; a bar from eye onto side.

I have seen no Ceylonese specimens of this species.

### Genus PEROPUS Wiegmann

*Peropus* Wiegmann, Nova Acta Acad. Leop. Carol., vol. 17, 1835, p. 238 (type of genus [*Peropus mutilatus*]).

A single species of the genus occurs in Ceylon.

#### *Peropus mutilatus* Wiegmann

*Hemidactylus* (*Peropus*) *mutilatus* Wiegmann, Nova Acta Acad. Leop. Carol., vol. 17, 1835, p. 238 (type locality, Manila, P. I.).

*Gehyra mutilata* Boulenger, Catalogue of the Lizards of the British Museum, vol. 1, 1885, p. 48; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 96; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 105-106, fig. 30.

**Diagnosis:** A specimen (No. 41 ♀) from Tonacombe Estate, Namunukula, Ceylon, is used as the basis of the diagnosis and description.

Three pairs of chinshields, the outer small, extending but slightly farther back than inner; digits webbed at base; seven to nine strongly



oblique lamellae under fourth toe; labial border of mental equals that of rostral; head with small granules; on snout granules a little larger; dorsum with very small granular scales; scales cycloid, imbricate on venter; skin-fold on flank and on posterior margin of leg; male with 25-41 preano-femoral scales, meeting mesially.

*Description:* (from No. 41 Tonacombe Estate, Namunukula, Ceylon, a small species, snout-to-vent length, 51 mm., tail 50 mm.) Rostral not twice as wide as high; large internasals separated mesially; nostril surrounded by rostral, first labial, internasal and two postnasals; 47 scales across snout between fourth supralabials; 42 granules between edges of eyelids; scales on back distinct, rounded, imbricate or subimbricate, larger on sides than on middle of dorsum, and merging into scales of venter; no distinct ventrolateral fold; approximately 48 scales across venter, cycloid, imbricating; supralabials, 10-10, infralabials, 9-10, the last of both series small; labial border of mental smaller than that of rostral; two very large postmentals touching each other, their common suture twice that with the mental; each postmental touching a single labial; outer pair of postmentals slender, not extending behind first pair, touching two labials; a few enlarged scales follow second pair; ear nearly quadrangular, less than half diameter of eye. Digits with a narrow angular joint and a basal part with well-defined, paired, diagonally placed lamellae distally, the proximal lamellae being almost flat, scalelike, 10-13 on four outer fingers and toes, nine or ten on inner; claws present on all digits; skinfold or web on back of leg ample; tail flattened below, with fine scales arranged in indefinite whorls, about ten rows to each whorl.

*Color:* Above lavender-gray with a more or less definite series of rounded light spots on each side near middle of back and some scattered light spots on sides; scattered spots on occiput; yellowish white below.

*Remarks:* I have examined one other specimen from Ceylon, U.S.N.M. No. 59014 ♀ without exact locality. This specimen has a well-developed third pair of postmentals separated from labials by small granular scales.

### *Hemiphyllodactylus* Bleeker

*Hemiphyllodactylus* Bleeker, Nat. Tijdschr. Ned. Ind., vol. 20, 1860, p. 327 (type of the genus, *Hemiphyllodactylus typus*.) A single representative of this genus is known in Ceylon.

### *Hemiphyllodactylus typus typus* Bleeker

*Hemiphyllodactylus typus* Bleeker, Nat. Tijdschr. Ned. Ind., vol. 20, 1860, p. 327 (type locality, Gunong Paring, Java); Deraniyagala, Ceylon Journ.



Sci., B, vol. 16, 1932, p. 308; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 107-108, (part).

*Lepidodactylus ceylonensis* Boulenger, Cat. Lizards of the British Museum, vol. 1, 1885, p. 164, pl. 13, fig. 3, Fauna of British India, including Burma and Ceylon, 1890, p. 98; Annandale, Journ. Asiat. Soc. Bengal, N. S., vol. 1, 1950, and Spolia Zeylanica, vol. 8, 1915, p. 239 (Ganipola near Kandy, 1,600-1,700 ft. Peradeniya.)

**Diagnosis:** A small, slender lizard reaching a snout-vent length of 60 mm.; tail 60 mm.; digits free, subcylindrical at base; four toes with lamellae of which the terminal portion is actually or partly divided, the terminal joint rising angularly from within the widened basal part; inner finger and toe without free distal phalanx but sometimes bearing a claw; an angular series of 10-11 preanal pores, separated from a series of 8-10 femoral pores; supralabials, 10-12; infralabials in like number; back and top of head covered with uniform small granules, without tubercles; no postmentals, but several polygonal scales present behind the mental.

I have no specimens at hand from Ceylon. I am not wholly certain that the Ceylon specimens are referable to the typical form.

#### Genus LEPIDODACTYLUS Fitzinger

*Lepidodactylus* Fitzinger, Systema Reptilium, 1843, pp. 19, 98 (type of genus, *Platydictylus lugubris*).

*Amydosaurus* Gray, Catalogue of the Specimens of Lizards in the collection of the British Museum, 1845, p. 162 (type, *Platydictylus lugubris*).

Whether the form of this genus occurring on Ceylon is subspecifically referable to the widespread oceanic form of *lugubris* may be doubted. I have not seen a specimen.

#### *Lepidodactylus lugubris* Duméril and Bibron

*Platydictylus lugubris* Duméril and Bibron, Erpétologie Générale, vol. 3, 1836, p. 304 (type locality, Tahiti); Deraniyagala, Ceylon Journ. Sci., B, vol. 15, 1929, p. 157, pl. 33; *ibid* vol. 16, 1932, p. 307, fig; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 115-116, fig. 33 (part).

Not having examined the Ceylonese form of this genus, I follow Deraniyagala in placing it in the species *lugubris* and take data from Smith for the diagnosis.

**Diagnosis:** A diminutive species (snout to vent 42 mm.; tail 40 mm.), with digits webbed at base, strongly dilated, bearing transverse (or distally) strongly oblique lamellae; supralabials 11-13; mental smaller than adjacent labials; no distinct postmentals, the space occupied by some rows of polygonal scales; snout granules somewhat larger than those on head and dorsum; venter with flat, cycloid imbricate scales; 12-14 lamellae under longest toe; hind leg



reaches two thirds of the distance to axilla; tail swollen at base, with a sharp denticulated edge, covered above with small subimbricate scales and below with larger imbricate scales; male with a continuous series of 25-30 preano-femoral pores which form a slight angle mesially.

Light, pinkish gray or brownish above generally with a vertebral series of paired spots, or pigment may be arranged as a sinuous marking; a dark streak from tip of snout passing through eye to ear; young may have one or more dark stripes; lower surfaces light or speckled with brown.

#### Genus *LOPHOPHOLIS* Smith and Deraniyagala

*Lophopholis* Smith and Deraniyagala, Ceylon Journ. Sci., B, vol. 18, 1934, p. 235 (type of genus, *Teratolepis scabriceps* Annandale).

This monotypic genus is known only from southern India and Ceylon.

#### *Lophopholis scabriceps* (Annandale)

*Teratolepis scabriceps* Annandale, Mem. Asiat. Soc. Bengal, vol. 1, 1906, p. 187, pl. 9, fig. 1, a-c (type locality, Ramnad, Madura District, south India).

*Lophopholis scabriceps* Smith and Deraniyagala, Ceylon Journ. Sci., B, vol. 18, 1934, pp. 235-236 (Mariccukatti, Northern Province, Ceylon); Smith, The fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 124-125, fig. 37.

*Diagnosis:* A small gecko (snout to vent 45 mm., tail 50 mm.), the dorsum covered with imbricate scales a little larger than ventral scales; caudal scales uniform with body scales; three preanal pores on each side, separated mesially by a scale; ear subcircular, its diameter about one third of the eye diameter; supralabials, seven or eight, infralabials, six or seven; two pairs of postmentals, the inner pair largest; head with small granules; body scales slightly elongated, striated, feebly keeled; digits short; hind limb reaches about half way to axilla; tail round, tapering to a point, covered with uniform, imbricate scales.

Gray-brown with brown marking above arranged as transverse bars; below dirty whitish; known in southern India and Ceylon (one locality). (Data from Smith, 1935. I have seen no specimen.)

#### Family AGAMIDAE

Six genera occur of which *Lyriocephalus* and *Ceratophora* are endemic. *Cophotis* is excluded from India but a species occurs in Java and Sumatra. *Sitana*, *Otocryptis*, and *Calotes* occur both in India and Ceylon. Twelve genera occurring in South Asia are unknown in Ceylon.



## KEY TO THE CEYLONESE GENERA OF AGAMIDAE

1. Four digits on feet, five on hands.....*Sitana*  
    Five digits on hand and feet..... 2
2. Fifth toe short, not longer than first.....*Otocryptis*  
    Fifth toe longer than first toe..... 3
3. A rostral appendage..... 4  
    No rostral appendage..... 5
4. A strong globular protuberance on tip of snout.....*Lyriocephalus*  
    A narrow pointed rostral protuberance, scaled or naked (reduced  
    in female).....*Ceratophora*
5. Dorsal scales enlarged, irregular, unequal; tail prehensile....*Cophotis*  
    Dorsal scales more or less equal-sized, regularly arranged; tail  
    greatly elongated, not prehensile.....*Calotes*

## Genus SITANA Cuvier

*Sitana* Cuvier, Règne Animal, 2nd ed., vol. 2, 1829, p. 43 (type of genus, *Sitana ponticeriana*).

Only a single species of this genus is recognized.

*Sitana ponticeriana* Cuvier

*Sitana ponticeriana* Cuvier, Règne Animal, 2nd ed., vol. 2, 1829, p. 43 (type locality Pondicherry, India); Kelaart, Prodr. Faun. Zeylanicae, 1852-1853, p. 164; Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 1, 1885, pp. 270-271; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 114-115; Deraniyagala, Ceylon Journ. Sci. B, vol. 16, 1931, pp. 141-142; Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 144-146.

*Sitana minor* Günther, Reptiles of British India, 1864, pp. 135-136, pl. 14, fig. A, (type locality, Madras, India) ("it is more probable that the Ceylonese *Sitana* is identical with the Madras species" [*i. e.* *S. minor*]).

**Diagnosis:** A small terrestrial agamid, with five fingers and four toes; body compressed, covered with regular keeled scales; no crest on back or neck; a strong gular appendage on throat, extending to abdomen; no femoral or preanal pores; tympanum present, visible.

**Description of species:** (E.H.T.-H.M.S. No. 30645 12 mi. N Trincomalee.) Rostral small, bordered laterally by a labial, and behind by five small scales; nasal large, elevated where the nostril is pierced, separated from rostral by a single scale; an elongate supranasal contiguous or imbricating with canthal scales; two median scales on anterior frontal region elevated and with a more or less continuous keel; on each side two very slight ridges may be traced back between the orbits; supraocular scales enlarged, irregular as are the occipital scales; a very fine nuchal ridge or crest; a few enlarged scales on the middle edge of upper eyelid; supralabials, 8-9; infralabials, 8-8; mental much narrower than the rostral; an



enlarged gular appendage extending onto anterior part of abdomen; no femoral or preanal pores; leg long, the fourth toe reaching beyond snout; fifth toe lost; five fingers; scales on dorsum enlarged, in ten or eleven rows; adjoining scales on sides much smaller, but with a few scattered enlarged scales; scales on gular appendage enlarged, distinctly larger than ventral scales; approximately 20 rows of large ventral scales; tail rounded, the scales keeled but not arranged in distinct whorls.

*Color:* Above brownish, with a very indistinct lighter border on the outer row of enlarged dorsal scales; six pairs of black spots on each side, divided by the median line; sides darker with fine, light, ill-defined dots; a metallic cream spot on tympanum; venter lighter, with a black line from tip of chin back and onto the front of the gular appendage; tail very indefinitely barred.

*Measurements in mm.:* Length snout to vent, 51; tail, 114; head length, 15; head width, 10; axilla to groin, 25; arm, 25; leg, 50.

*Remarks:* The following specimens were examined: E.H.T.-H.M.S. 30628-30640, 30642, 30645, 30647-30655; Nos. 30660-30670, 30671, 30672 "Ceylon"; U.S.N.M. 58508 "Ceylon."

#### Genus OTOCRYPTIS Wagler

*Otocryptis* Wagler, *Natürliches System der Amphibien*, 1830, p. 150, (type of genus, *Otocryptis wiegmanni*); Wiegmann, *Isis*, 1831, p. 291 (type of genus, *Otocryptis bivittata*).

This genus may be readily recognized by the greatly reduced outer toe which is smaller than the first toe. The species are terrestrial. Two species are known, one of which occurs in Ceylon, the other in southern India.

Hallowell (*Proc. Acad. Nat. Sci. Philadelphia*, 1860, p. 491), and Stejneger (*U. S. Nat. Mus. Bull.* 58, 1907) consider the possibility of a member of this genus occurring in the Riukiu Islands.

#### *Otocryptis wiegmanni* Wagler

*Otocryptis wiegmanni* Wagler, *Natürliches System der Amphibia* 1830, p. 150 (type locality, America, [*ex errore*]). Here corrected to Ceylon.

*Otocryptis bivittata* Wiegmann, *Isis*, 1831, p. 291. (type locality unknown); Peters, *Monatsb. Akad. Berlin*, 1860, 184 (Trincomalee, Hinida, Ratnapura, Adam's Peak); Günther, *Reptiles of British India* 1864, pp. 127-128; Boulenger, *Catalogue of the Lizards in the British Museum*, 2nd ed., vol. 1, 1885, p. 271; Haly, *First Report on the collection of Lizards in the Colombo Museum*, 1886, p. 6 (Ramboda and the Western Province); Theobald, *Descriptive catalogue of the Reptiles of British India*, 1876, p. 98. Boulenger, *The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia*, 1890, pp. 115-116; Green, *Journ. Bombay Nat. Hist. Soc.*, vol. 15, 1903, p. 817. Deraniyagala, *Ceylon Journ. Sci.*, B, vol. 16, 1931, pp. 142-143; Smith, *The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia*, vol. 2, Sauria, 1935, pp. 146-147. ("common at Peradeniya.")



*Diagnosis:* A very small outer toe; male with a very extensive gular flap extending to center of abdomen. Hind leg reaches far beyond tip of snout.

*Description of species:* (from E.H.T.-H.M.S. No. 30613). Length, snout to vent, 64 mm.; the length of head (19 mm.) much less than twice the width (12 mm.); rostral rather large, bordered by two labials and five scales, separated from nasal by a single pre-nasal; nasals large forming a mound with crater, the rim the highest part; a large supranasal, nearly as large as nasal; four canthals continuous with the elongate, broadly imbricating superciliary series; scales on snout rough, unequal, keeled, two median ones forming a short ridge beginning at posterior level of nasals; from here two smaller series of scales diverge that are continuous with the enlarged keeled scales bordering inner edge of orbits, and which continue around behind eye, the two series separated by from three to five scales; supralabials, 12-12; infralabials, 10-10; mental narrow, longer than wide, much smaller than rostral; scales around middle of body, approximately 78; all dorsal and lateral scales keeled and pointing backward and upwards; the ventral scales strongly keeled, somewhat mucronate; limbs long, the terminal joints of fingers reach beyond snout; leg brought forward, the entire free part of fourth toe extends beyond snout; 28 keeled scales under free part of fourth toe; tail cylindrical not compressed, longer than head and body. A broad "dewlap" in males beginning on chin and extending more than half length of abdomen, covered with larger keeled scales (absent in females and very young).

*Color:* Body dull brown to blackish brown; head blackish brown, the dewlap black on the anterior part; limbs light brown; tail indistinctly banded with broader dark bands, and narrow, dull, light bands; sides lighter, with some dull whitish marks on each side scarcely discernible unless specimen is submerged.

*Measurements in mm.:* Snout to vent, 64; tail (broken); width of head, 12; length of head, 19; axilla to groin, 27; arm, 30; leg, 75.5. Length of dewlap, 40; depth of dewlap, 16.

*Remarks:* The series of 18 specimens available in the E.H.T.-H.M.S. collection, Nos. 30610-30627, are all from 12 miles north of Trincomalee, Ceylon. Here they were found most frequently in the forest bordering on the shore. They are terrestrial, the reduced size of the outer toe presumably being a handicap in climbing.

Females are lighter brown than the males and occasionally specimens show a series of four deep-black, dorsal spots somewhat chevron-shaped; the legs and feet may be spotted black; in these the head is darker than the body; usually whitish below.



A young specimen (E.H.T.-H.M.S. 30622) has a distinct dark bar across the frontal region of head with some spots on neck.

*Otocryptis* sp.?

A specimen, U.S.N.M., No. 120328 from Nandana Estate, Peradeniya, Kandy District, differs considerably from the species described under the name *wiegmanni*. The differences, as seen by comparing this highland specimen with the lowland series, would seem to warrant a specific separation. The more striking differences are as follows: scales on nuchal region distinctly larger, as are the scales along the dorsum; a distinct dorsal ridge along the middle of back with crest; scales on lower half of sides directed backward and downward; gular dewlap smaller (length, 24 mm., depth, 12 mm.); head and gular fold not blackish.

I strongly suspect that two species are involved but until the characteristics of the type are ascertained one is uncertain to which of the forms the name *wiegmanni* must apply. It is presumed that *wiegmanni* and *bivitatta* have the same type.

Genus *COPHOTIS* Peters

*Cophotis* Peters, Monatsb. Akad. Wiss. Berlin, 1861, p. 1103, (type of genus, *Cophotis ceylonica*).

*Cophotis* is a genus containing only two species, one of which occurs in Ceylon and this chiefly in the higher regions. The other occurs in Java and Sumatra, without any known form occupying the Indian and southeastern Asiatic regions.

The Ceylon species is ovoviviparous. It may be recognized from other species by the large, scattered, flattened, dorsal scales on a strongly compressed body, by absence of femoral and preanal pores, in males, the absence of a tympanum, the presence of a short nuchal crest, a dorsal crest, and the presence of a small gular pouch.

*Cophotis ceylanica* Peters

*Cophotis ceylanica* Peters, Monatsb. Akad. Wiss. Berlin, 1861, p. 1103 (type locality, Ceylon); Günther, Reptiles of British India, 1864, p. 132, pl. 13, fig. H; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, pp. 100-101; Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, p. 275; Haly, First Report on the collection of Lizards in the Colombo Museum, 1886, p. 6 (Ramboda; Le Vallon Estate); Boulenger, The Fauna of British India including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 118; Willey, Spolia Zeylanicae, vol. 3, pt. 12, Apr. 1906, pp. 235-237, pl. and fig. in text; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, pp. 148-149, pl. 34; Hora, Records of the Indian Museum, vol. 28, pt. 4, 1926, pp. 216-217 (Nuwara Eliya); Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, pp. 150-151, fig. 46.

*Diagnosis:* A small lizard (snout-to-vent length approximately



60 mm.; the tail, 85 mm.); body compressed; dorsal scales relatively large; about 33 scales around body; head slender; a discontinuous nuchal and dorsal crest; a small gular sac; five fingers and five toes; tail prehensile, curving down; tympanum hidden; no preanal or femoral pores.

*Description of species:* (from E.H.T-H.M.S. No. 30500, "Ceylon"). Length of head twice as long as width; snout longer than eye; head narrowed, rather pointed, the three postrostrals and three adjoining scales form an indistinct "boss or nose"; nostril in a large scale, separated from the rostral by three scales, touching the second and third labials; scales in frontal region large, irregularly elevated, with a depression between the orbits; a somewhat elevated median scale in depression; five or six enlarged supraoculars, all very irregular; a pair of enlarged tubercular scales on parietal region, behind which are two distinctly elevated tubercular scales; supralabials, 10; infralabials, 8 or 9; mental smaller than rostral; a series of irregular keeled scales extend back from lower edge of eye in temporal region; scales under chin, smooth; a small gular sac present; approximately eight lateral rows of enlarged scales pointing backward and downward, strongly imbricating, smooth or slightly keeled; lower part of sides and venter with strongly mucronate, smaller, keeled scales in about 16 rows; a nuchal crest consisting of four or five spines, separated from the dorsal crest, which consists of soft, spiny scales about fifteen in number, separated by short intervals; tail compressed, prehensile; hind leg reaching axilla; arm reaching beyond tip of snout; third and fourth toes practically of equal length.

*Color:* Olive green above with some lighter markings and some scattered darker markings; a light brown mark along upper lip, covering labials and adjoining scale row and extending onto shoulder; a lighter spot on back of occiput; lower labials dark brown, the throat and chin cream with scattered dark flecks, or lines; venter dirty gray-white; tail banded darker and lighter gray; some trace of darker bands low on sides.

*Measurements in mm.:* Snout-to-vent length, 61; tail, 79; head length, 18; head width, 9; arm, 29; leg, 30; axilla to groin, 30.

*Remarks:* The species is ovoviviparous. It is a highland form, known up to elevations of 7000 feet.

### *Ceratophora* Gray

*Ceratophora* Gray, Illustrations of Indian Zoology, vol. 2, 1835, pl. 68, fig. 2, (type of genus: *Ceratophora stoddartii*).

*Lyriocephalus* (part) Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 99.



This genus, endemic in Ceylon, is represented by three species, all seemingly clearly differentiated, occupying territory at an elevation in excess of 3500 ft. All have a characteristic soft appendage protruding from the tip of the snout.

#### KEY TO THE SPECIES OF CERATOPHORA

1. Gular scales smaller than ventral; rostral appendage scaly, pointed ..... *aspera*  
     Gular scales larger than ventrals ..... 2
2. Gular scales smooth or feebly keeled; lateral scales large very unequal; rostral appendage smooth pointed ..... *stoddartii*  
     Gular scales strongly keeled; lateral scales large, nearly equal; rostral appendage, compressed, suboval, covered with scales or granules ..... *tennentii*

#### *Ceratophorus tennentii* Günther

*Ceratophorus tennentii* Günther, in Tennent, Natural History of Ceylon, 1861, p. 281, fig. (type locality, Ceylon); Reptiles of British India, 1864, pp. 130-131 (more complete description); Boulenger, Catalogue of the Lizards of the British Museum, 2nd ed., vol. 1, 1885, p. 278; Haly, First Report of the Collection of Lizards in the Colombo Museum, 1886, p. 6; Boulenger, Fauna British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 120; Deraniyagala, Ceylon Journal Sci., B, vol. 16, 1931, p. 145-146. *Lyriocephalus tennentii* Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, pp. 99-100.

*Diagnosis:* Head scales small, irregular; a ridge on each side of occiput; rostral appendage large in both sexes, fleshy, compressed, suboval, covered with scales and granules; supralabials, 9; infra-labials, 9 or 10; gular scales feebly keeled, large, quadrangular, forming regular longitudinal series; a low toothed nuchal crest; scales on dorsum irregular and unequal in size, the larger ones feebly keeled; lateral scales equal, large, strongly imbricating, pointing upward and backward; smooth or feebly keeled; ventral scales smaller; leg reaches to eye or a little beyond; tail slightly compressed, scales keeled.

Olive above, irregularly marbled with brownish, young with an angular crossband between eyes; sometimes with white longitudinal lines; a more or less distinct, white line along hinder side of thighs. Length, 260 mm.; tail, 170; arm, 48; leg, 76. (After Boulenger, 1884.)

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Tennent, in writing of the form, anticipates Günther by publishing the name and brief description as follows: "Among the specimens sent from Ceylon by Dr. Kelaart, and now in the British Museum, there is one which so remarkably differs from *C. Stoddartii*, that it attracted my attention by the peculiar form of this rostral appendage. Dr. Günther has pronounced it to be a new species; and Dr. Gray concurring in this opinion, they have done me the honour to call it *Ceratophora Tennentii*". From this statement one might suppose that the name should be attributed to Günther and Gray. However Günther refers to the Tennent reference as "Günther, in Tennent" so it would appear that Gray had no part in the naming.



*Ceratophora aspera* Günther

*Ceratophora aspera* Günther, Reptiles of British India, 1864, p. 131, pl. 13, figs. G. and G' (type locality, Ceylon); Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 1, p. 278 (Ceylon, "south Ceylon"); The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 120; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, pp. 146-147; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1930, p. 154.

*Lyriocephalus asper* Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 100.

*Diagnosis:* A diminutive form, total length, 82 mm.; snout-to-vent length, 37 mm.; head scales small irregular, each of which forms a small tubercle; a larger tubercle behind superciliary edge; back of head with a pair of low ridges convergent anteriorly; rostral projection slender, covered with small imbricating scales, all keeled, the projection equaling head length in males, rudimentary in females; throat with small strongly keeled scales; scales on the dorsum and sides small with larger, irregular, keeled scales intercalated; no dorsal or nuchal crests, but some of the larger scales form series across the vertebral line, with their angles pointing posteriorly; ventral scales keeled; preanal region with small scales; tail not compressed, all scales keeled; hind leg reaches to, or near to orbit; brownish, marbled with darker; a rhombic light spot on rump; brown spots on arm, edged with white in male.

*Ceratophora stoddartii* Gray

*Ceratophora stoddartii* Gray, Illustrations of Indian Zoology, vol. 2, 1834, pl. 168, fig. 2 (type locality, Ceylon, Stoddart, coll.); Catalogue of the specimens of lizards in the collection of the British Museum, 1845, p. 237; Kelaart, Prod. Faunae Zeylanicae, 1852 (1853), p. 165; Günther, the Reptiles of British India, 1864, p. 129, pl. 13, fig. F, F', F''; Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 1, 1885, p. 277; Haly, First Report on the Collection of Lizards in the Colombo Museum, 1886, p. 6, ("numerous specimens from the hill districts"); Boulenger, The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 119; Boettger, Ber. Offenb. Ver. Nat., vol. 29-32, 1892, p. 69; Willey, Spolia Zeylanica, vol. 3, 1906, p. 236; Deraniyagala, Ceylon Journ. Sci., vol. 16, B, 1931, p. 144; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 152-153.

*Lyriocephalus stoddartii* Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 99.

There are six specimens in the collections available here and all seem to belong to *Ceratophora stoddartii*. However, there is considerable variation in this group of specimens as to character of the enlarged scales, the rostral appendage, keeling of dorsal and ventral scales, length of hind limb and coloration. Unfortunately the exact provenance of these specimens is unknown. None of these variations can be attributed to sex, since all are males. I suspect that there may be distinct geographical races represented among them.



*Diagnosis:* Five fingers and toes; body compressed, the scales on the sides irregular in size; in the male, a smooth, compressed or pyramidal appendage on tip of snout without any scales; tympanum hidden; no preanal or femoral pores; gular pouch absent.

*Description of species:* (from E.H.T.-H.M.S. 30495 "Ceylon"). Rostral appendage conical, sharply pointed, its base surrounded by a median pair of supralabials (paired rostral?) and five other small scales; nasal scale somewhat craterlike, separated from appendage by three scales, separated from its fellow by six scales; four canthal scales, the canthus rather rounded; a pair of low pyramidal scales in frontal region; supraoculars irregular, the inner row largest separated from its fellow by three small scale-rows; last four scales of inner row pass behind eye, covering an angular elevation; a pair of knobs or bosses in parietal region, covered by a few large scales and separated from each other by approximately seven scales; a transverse row of slightly elevated scales across head in front of these bosses; two large, prominent, elevated scales in temporal region above tympanum; behind eye, a row of three, large, elevated contiguous scales; supralabials, 14-14; infralabials, 13-13; a group of larger scales on edge of upper eyelid, the largest scales (3 or 4) bordering edge; mental small, separating first postmentals; scales on chin quadrangular, forming definite rows, smaller mesially, the rows nearest the labials larger than ventral scales; all ventral scales on chin and body smooth; scales on limbs very unequal with a few keeled scales; a few scales on the posterior border of arm and leg that bear small tubercles; scales on venter small, more or less regular, smooth; scales on body very irregular; a small nuchal crest beginning behind occipital bosses continues to near level of arm insertion; no dorsal crest; scales above arm largest, forming a curving row; crossing the back are series of scales somewhat larger than intervening scales; no femoral or preanal pores; fourth toe much longer than third reaching to a point near back of orbit; tail somewhat compressed, the whorls indistinct and bordered behind by larger irregular scales; the scales above and below keeled.

*Color:* (In preservative.) Blackish with a series of six, dim, gray lines crossing back on the larger scales; arms and legs barred with black and ultramarine; tail dimly barred with olive and gray; labials, chin, throat, and area about angles of jaws, whitish; below, olive with some scattered gray flecks; larger scales on sides ultramarine.

*Measurements in mm.:* Snout to vent, 80; tail, 162; length of head, 25; width of head, 15; length of rostral appendage, 105; arm, 42; leg, 64.



*Remarks:* There are certain variations which may be arranged in the form of a key.

1. Rostral appendage laterally compressed; scales on top of head, gular region, breast, under tail, on arms and legs, to some extent on sides and ventral surfaces, keeled; appearing between the occipital bosses is a short, denticulate, nuchal crest rising from an elevated fold about four scales high, reaching posteriorly to back level of arm insertion; a row of six, enlarged, lateral, white scales, their position marking lower edge of dim light transverse bands that follow series of slightly enlarged scales; a slight diagonal series below eye, each scale with a whitish elevated center. "Ceylon" E.H.T.-H.M.S. No. 30494

Rostral appendage not laterally compressed; scales on head, tail, and at least lower part of arms and legs with keels; venter, chin and neck smooth; a white lateral line present or absent; crest variable in height, length and origin. . . . . 2

2. A pair of dorsolateral whitish or cream lines extending onto tail; lips and posterior jaw-angle whitish; chin and throat cream; sides darker, some of the large lateral scales lavender; arms and legs banded lavender and brown; skin on neck black; a crest begins a short distance behind occipital bosses, with approximately 10 denticulations; ventral scales smooth. "Ceylon" . . . . . U.S.N.M. 19216 ♂

No dorsolateral lines; keeling variable, origin and length of crest variable . . . . . 3

3. Scales on venter and breast, and median scales on chin, keeled; a low crest arises between occipital bosses, which are rather closely approximated; denticulated scales of crest compressed, widened at base, the ridge four scales high at highest point; the denticulations continued beyond crest; there are 14 scales in the nuchal crest and approximately 10 in dorsal crest, contiguous or more rarely narrowly separated,

K.U.M.N.H. Nos. 20131-20132

Ventral scales smooth; dorsals smooth; dorsal head scales, tail and some scales on limbs, keeled; nuchal crest rather elongate, consisting of 15 denticulate scales, with a few, low, inconspicuous median dorsal scales following; first two scales of crest paired between bosses in one, but not so in the second specimen . . . . . E.H.T.-H.M.S. 30495; U.S.N.M. 19217

The single copy available to me of Gray's, *Illustrations of Indian Zoology* has the plate 168 missing and I cannot judge which of the above specimens show closest resemblance to the type figure. Since no specific localities are available with these specimens, it is impossible for me to determine whether these differences represent geographic variations or not. Aside from the scale differences it is possible that the living specimens may have shown considerable color and pattern differences. Collections of series of this species



from very numerous localities is essential for an understanding of the meaning of this variation, and no new form should be named until adequate series are available, and compared with the type of *C. stoddartii*.

### Genus LYRIOCEPHALUS Merrem

*Lyriocephalus* Merrem, Tentamen Systematis Amphibiorum, 1820, p. 49, (type of genus, *Lyriocephalus margaritaceus*).

A single species is known. It is endemic in the highlands of Ceylon.

### *Lyriocephalus scutatus* Linnaeus

*Lacerta scutata* Linnaeus, Systema Naturae, ed. 10, 1758, p. 201, (Based on a figure in Seba, Thesaurus, vol. 1, p. 173, pl. 109, fig. 3 [type locality, "Amboyna" *ex errore*. Restricted to Ceylon.]).

*Lyriocephalus margaritaceus* Merrem, Tentamen Systematis Amphibiorum, 1820, p. 49 (Based on Seba).

*Lyriocephalus scutatus* Kelaart, Prod. Faun. Zeylanicae, 1852 (1853), p. 166; Günther, Reptiles of British India, 1864, p. 128; Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 99; Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, pp. 281-282 (synonymy); Boulenger, The Fauna of British India including Ceylon and Burma; Reptilia and Batrachia, 1895, pp. 121-122; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 147-148, pl. 33, and *ibid.* vol. 17, 1932, p. 46.

*Lyriocephalus macgregorii* Gray, Illustrations of Indian Zoology, vol. 2, pl. 68, fig. 1.

*Diagnosis:* A pair of sharp high bony crests on sides of snout following the superciliary edge, terminating in a bony point behind orbit; a rounded protuberance on tip of snout.

*Description of species:* (from K.U.M.N.H. No. 19534). Head ridges above flare out anteriorly, the distance between them greater than posteriorly at their termination; scales on snout protuberance large, about 20 in number; scales on head variable in size; an irregular larger scale series outlines the inner dorsal part of orbit, separated from opposite series by five scale rows; three or four enlarged supraoculars; crests bordered by enlarged compressed scales, terminal one largest; rostral and two adjoining labials form part of the globular protuberance on snout; supralabials 16, infralabials about 18, the posterior scales not well differentiated; tympanum wanting; a transverse series of four compressed spines on occiput, behind which are a pair of high compressed soft spines; nostril directed outward and slightly downward; a row of 26 suborbital scales from nostril, the three posterior largest, terminating in the temporal region; a crest present, composed of soft, dorsal, serrate scales; posteriorly, the scales of the crest are separated; body covered with small, flat, imbricating scales, directed upward, with three series of larger scales on sides of neck, shoulders, and sides; below these, on sides, numerous scattered trihedral or heavily keeled



scales; approximately 28 keeled ventral scale series; a strongly defined, gular pouch or fold; tail rather short, compressed, with four rows of keeled scales below; no femoral or preanal pores; five fingers and five toes, the limbs strong, well developed; hind limb reaching mouth angle; 22 scales under free part of fourth toe.

*Color:* Leaf green in life; gular sac yellow, the enlarged scales green; belly sometimes bluish; globular protrusion on snout, light brownish or cream.

*Measurements in mm.:* (from K.U.M.N.H. Nos. 19534, 19535, 19536 Ceylon respectively.) Snout to vent length, 125, 132, 154; tail, 105, 127, 152; arm, 63, 70, 77; leg, 81, 85, 105; width of head, 24, 25, 27; length of head, 34, 34, 40.

*Remarks:* This species has a superficial resemblance to a species of *Chamaeleon* found in Ceylon and it is perhaps on this general resemblance of the skulls that some are inclined to reduce the chamaeleon group to the status of a family, Chamaeleonidae.

*Variation:* A female specimen, U.S.N.M. No. 58489, from Peradeniya, Ceylon, is gray, the upper free edges of the scales being edged with brown. The rows of enlarged scales and the scattered individual scales or groups of larger keeled scales are blue. The dorsal crests are low. The enlarged scales on the tail and limbs are bluish.

A pair of sharp incisors, above and below, are present in this species.

### Genus CALOTES Cuvier

*Calotes* Rafinesque, Anal. Nat., 1815, p. 75, nomen nudum.

*Calotes* Cuvier, Règne Animal, vol. 2, 1817, p. 35 (type of genus, *Lacerta calotes*).

The genus *Calotes* extends through southern Asia, throughout the Philippines and most of the East Indian Archipelago. Six clearly differentiated species occur in Ceylon.

#### KEY TO THE SPECIES OF CALOTES IN CEYLON

- |  |                    |
|--|--------------------|
| 1. Scales on sides point backwards and upwards.....              | 2                  |
| Scales on sides pointing backwards or backwards and downwards,   | 4                  |
| 2. Two separated spines above tympanum.....                      | <i>versicolor</i>  |
| A row of 8 or 9 compressed spines above tympanum.....            | <i>calotes</i>     |
| 4. No spines on head .....                                       | <i>liocephalus</i> |
| Spines present on head .....                                     | 5                  |
| 5. A row of spines above and somewhat behind tympanum; ventrals  |                    |
| larger than dorsals .....  | <i>nigrilabris</i> |
| At least two separated spines above tympanum.....                | 6                  |
| 6. Lateral scales pointing backwards but not downward; no dorsal |                    |
| crest .....  | <i>ceylonensis</i> |
| Lateral scales pointing backwards and downwards; a dorsal crest, | <i>liolepis</i>    |



No less than six species of the genus *Calotes* are known to occur on the island of Ceylon, and of these four, *C. ceylonensis*, *nigrilabris*, *liolepis* and *liocephalus*, are endemic; two others occur in India also, one, *C. calotes* being confined to Southern India and the Nicobar Islands; the other, *C. versicolor*, has a very wide distribution in southern and southeastern Asia, and parts of Sumatra.

These species are arboreal, some (perhaps all) coming to the ground to deposit their eggs. I have recently described the process of nestbuilding in *Calotes calotes*.\*

### *Calotes versicolor* (Daudin)

*Agama versicolor* Daudin, Histoire Naturelle des Reptiles, vol. 3, 1802, p. 395, pl. 44 (type locality, "India") restricted to Pondicherry, India by Smith ["terra typica"].

*Calotes versicolor* Kelaart, Prod. Fauna Zeylanicae, 1852 (1853), p. 170; *idem*, vol. 2, 1853 (1854), p. 7; Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed. vol. 1, 1885, p. 321; Haly, First Report on the Collection of Lizards in the Colombo Museum, 1886, pp. 2, 7; Boulenger, The Reptiles of British India, . . . Reptilia and Amphibia, 1890, pp. 135, 136, fig. 42; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 150-151; Smith, The Fauna of British India . . . Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 189-193.

**Diagnosis:** A *Calotes* with a strongly compressed body; a distinct gular sac, but lacking a pit or depression on front of shoulder; a swelling at base of tail in males that tapers regularly, the basal scales, especially dorsal ones, greatly thickened; scales on sides pointing backwards and upwards; two separated spines above tympanum, sometimes flanked by flattened, erect scales.

**Description of species:** (E.H.T.-H.M.S., No. 30594, 12 mi. N. Trincomalee, Ceylon). Body compressed with a rather high nuchal crest continuous with the dorsal crest; in males, cheeks strongly swollen, the forehead not concave; snout short, its length from orbit equal to distance between tympanum and eye; rostral relatively very small, less than one fifth of mental; nasal scale more than twice size of nostril, separated from the rostral by two scales; supralabials, 11-11, infralabials, 9-10; dorsal head scales smooth, irregular; mental large, sharply pointed behind; the labial border more than three times that of rostral; scale rows delimiting supraocular area scarcely distinguishable from other scales; five superciliaries; a pair of high, soft spines above tympanum, each flanked by erect, smaller, soft spines or scales; nuchal crest of flattened, somewhat curved, sharply pointed soft spines reaching a height of eleven millimeters; the dorsal crest lower, continuous, gradually diminishing in height, the scales contiguous, terminating abruptly eighteen millimeters be-

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\* Taylor, Herpetologica, vol. 7, 1951, pp. 59-60.



hind level of hind leg; scales on sides of body larger than ventrals, the scales pointing backwards and upwards, all keeled; gular pouch inconspicuous, or absent, in preserved specimens; gular scales as large as ventrals, mucronate; no pit or groove on shoulder; ventrals and caudals keeled; tail rather rounded, much swollen at base; approximately 42 scale rows around body; eighteen scales about widest part of tail base in males, the dorsal scales greatly thickened with a median rounded ridge and depression on each side; scales bordering crest directed nearly vertically, tending to hold the crest erect; hind leg brought forward, the toe reaches the middle of eye; third and fourth toes nearly equal; fourth toe much longer than third.

*Color:* Above olive brown or grayish in males, often with scattered distinguishable flecks of bluish white; tail very dimly barred with darker spots, some scarcely discernible; venter gray-white; limbs with some darker markings.

*Measurements in mm.:* Length, snout to vent, 128; tail, broken; head length, 40; head width, 31; axilla to groin, 56; arm, 57; leg, 85.

*Remarks:* The specimens available are as follows: E.H.T.-H.M.S. Nos. F. 984, F. 989, 30592-30609, 30641, 30646, 30656, 30659, 12 miles north Trincomalee, Ceylon. U.S.N.M. No. 38283 Kandy, Ceylon; 102317-102320, 102322-120324, Clodagh Estate, Rattota, Matale District, Ceylon; K.U.M.N.H. No. 19531-19532 "Colombo," Ceylon.

*Variation:* The local population differs very greatly in coloration, the females often being of a dark reddish-tan color with seven, rather broad, transverse bands across back, the bands interrupted on each side by a more or less distinct cream line running from shoulder onto tail; tail barred with dark bands at least on basal half; younger, half-grown males may have similar banding on a grayish background but lacking the light line (save in very young males); chin may have some black, converging lines, and some scattered black flecks on the under side of limbs and venter.

The known distribution of this species is from Afghanistan to Hong Kong, south in India and Ceylon, occurring also in Malaya and Sumatra. There is considerable variation in this very widespread species, especially in the size of the lateral scales and the number of rows around the body, the smallest numbers being found in Indian and Ceylonese specimens. It varies too in its vertical distribution, occurring in lowlands and at elevations up to 7000 feet. Subsequent study may prove that subspecific differences exist.



*Calotes calotes* (Linnaeus)

*Lacerta calotes* Linnaeus, Systema Naturae, 10th ed. 1758, p. 207 (type locality, Ceylon).

*Agama ophiomachus* Merrem, Tentamen Systematis Amphibiorum, 1820, p. 51.

*Calotes ophiomachus* Kelaart, Prodr. Faun. Zeylanicae, 1852 (1853) p. 169; *idem*, vol. 2, 1854, p. 7; Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, p. 327; Haly, First Report on the Collection of Lizards in the Colombo Museum, 1886, p. 8 (Rattota; Western and Eastern Provinces). The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 140; Deraniyagala, Ceylon Journ. Sci., B, vol. 15, 1931, p. 153.

*Calotes calotes* Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, pp. 201-202; Taylor, Herpetologica, 1951, p. 59 (egg laying habits).

**Diagnosis:** A very long-tailed species, green, with a series of narrow, transverse, bluish-white lines crossing dorsum; dorsal scales of body not larger than the ventral scales; an irregular row of compressed spines above tympanum; tail extremely long, usually at least three and one-third times snout-vent length; only 30-35 scale rows around body; a pit or depression present in advance of shoulder.

**Description of species:** (From E.H.T.-H.M.S. No. 30580, 12 mi. N Trincomalee, Ceylon.) Head rather short, the forehead very slightly concave; no gular fold; body compressed, rather triangular in cross section; rostral small, flanked by two labials and bordered behind by three scales, its labial border less than that of mental; nasal scale larger than rostral, at least three times area of nostril, separated from the rostral by two scales; scales on snout and head not keeled but the edges bordered by minute pores or tubercles giving them a roughened appearance; irregular scale-rows delimiting the supraocular areas, separated by three scale rows; supraocular scales, larger, irregular, about 10 or 11 in number; four superciliaries; supralabials, 10-10, the infralabials, 10-10; tympanum large, its diameter (3 mm.) slightly less than eye opening (3.2 mm.); a small pit at beginning of shoulder, covered with granular scales on black skin; scale rows on sides directed backwards and upwards, faintly keeled, not or scarcely larger than ventrals which are distinctly keeled; a pair of elongate, soft spines above tympanum each flanked by two or three, flattened, soft, erect scales, sometimes forming a continuous row above and extending somewhat anterior to tympanum level; nuchal crest composed of soft flattened spines and continuous with a short dorsal crest that rapidly diminishes in height; upper scale-row composed of mucronate, erect scales seemingly holding the crest erect; (tail in males not strongly inflated at base, the dorsal scales not especially modified); tail in females



rather slender, the length in both sexes 3.32 to 3.36 times head-body length; \* leg reaches to nostril.

*Color:* Bright green on head, body and tail, with five narrow, bluish-white lines crossing the body transversely, and one or two near base of tail; the lines as wide as a scale-row; tail dimly banded with darker and lighter in preserved specimens; males in life may show a reddish area on neck; belly light green or greenish white.

*Measurements in mm.:* Length, snout to vent, 91; tail, broken; length of head, 25; width of head, 17; length of snout, 8; length of orbit, 7.6; axilla to groin, 43; arm, 50; leg, 83.

*Remarks:* Specimens of this species available are as follows: E.H.T.-H.M.S. Nos. 30577-30591, 12 mi. N Trincomalee, Ceylon; U.S.N.M. Nos. 120316, 120321 Clodagh Estate, Rattota, Matale District, Ceylon; K.U.M.N.H. Nos. 20094 "Colombo," Ceylon; 31288, Tonacumbe Estates, Namunukula, Ceylon.

This species seemingly has the longest tail of any species in the genus, this appendage reaching a length equivalent to 3.84 times the snout-vent length. The white marks are usually visible, but during egg-laying activity all trace of this marking is lost and the color may become a dirty, blackish olive, or greenish brown.

After the eggs have been buried, the head is used for pounding the loose soil to make it firm above the nest.

### *Calotes liocephalus* Günther

*Calotes liocephalus* Günther, Ann. Mag. Nat. Hist., ser. 4, vol. 9, 1872, p. 86 (type locality, Peradeniya district Ceylon); Theobald, Descriptive Catalogue of the Reptiles of British India, 1876, p. 109; Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., 1885, p. 329, pl. 26; Haly, First Report on the Collection of Lizards in the Colombo Museum, 1886, p. 8 (Agrapatanas); Boulenger, The Fauna of British India . . . ; Reptilia and Batrachia, 1890, pp. 141-142; Müller, Verh. Nat. Gesellsch. Basel, vol. 8, 1889, p. 698; Deraniyagala, Ceylon Journ. Sci., B. vol. 16, 1931, p. 154-155; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, p. 204 (Gammaduwa, Agrapatnas, Punduluoya, in the Central Provinces).

*Diagnosis:* This species may be diagnosed by the absence of a pair of erect spinelike scales above and anterior to tympanum; as well as by the absence of a row of compressed scales above and somewhat behind tympanum; dorsal scales smaller than *liolepis* and feebly keeled, about as large as ventral scales; gular scales as large or a little larger than ventrals; 43-50 scale-rows around middle of body; hind limb reaches to eye or nearly as far; in male head large and base of tail swollen.

\* Malcolm Smith, *loc. cit.* gives the measurement of *Calotes calotes* as: snout to vent 130 mm.; tail 500, which is 3.84 times head body length.



Male uniform green, bluish green or olivaceous above, with five or six angular, reddish-brown crossbars; upper lips and cheeks with a brown streak, or spotted with brown; sometimes dark crossbars on top of head; base of tail light olive brown, the rest of it banded light and dark; below greenish white.

Female may be uniform green except for some black markings on snout and flanks. Snout to vent, 90 mm.; tail, 250. The species is known from the Central provinces (Gammaduwa, Agrapatnas, Punduluoya).

Data from Malcom Smith (1935, p. 204).

### *Calotes nigrilabris* Peters

*Calotes rouxi* Blyth, Journ. Asiat. Soc. Bengal, vol. 22, 1853, p. 647 (not of Duméril and Bibron).

*Calotes (Bronchocele) nigrilabris* Peters, Monatsb. Akad. Wiss. Berlin, 1860, p. 183 (type locality, "Newerelia" = ?Nuwara Eliya).

*Calotes nigrilabris* Günther, Reptiles of British India, 1864, pp. 143-144, pl. 40, fig. D. (Günther distinguishes two varieties, Alpha and Beta.); Boulenger, Catalogue of the Lizards of the British Museum; vol. 1, 1885, pp. 328-329 (Ceylon); Müller, Verh. Nat. Gesellsch. Basel, vol. 8, 1889, p. 698; Annandale, Spolia Zeylanica, vol. 8, pt. 30, June 1912, pp. 135-136 (Nuwara Eliya; Pattipola, alt. 6000 ft.); Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 153-154; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, p. 206 (Ceylon, in hills at high altitudes).

*Diagnosis:* A row of four or five flattened spines arising at a point above tympanum and extending behind its posterior level; a nuchal crest, and in males at least, a low, serrate, dorsal crest; scales of dorsum directed backwards and downwards; scales keeled; leg extends beyond orbit; coloration variable; an area of small tubercular scales on shoulder forming a "pit."

*Description of species:* Head large, areas about jaw angles rather inflated; rostral small, bordered by two labials and five postrostral scales; nasal rather large, the nostril occupying less than half its area, separated from rostral by a single scale; an elongate supranasal; four scales in canthal row, the canthal edge rather short; three superciliaries; dorsal head scales smooth, unequal; supraorbital area bordered by a row of larger, unequal scales, separated from its fellow by two scale rows; supraoculars, 15 to 17, unequal; nuchal crest rather high (beginning between a pair of slightly elongate, more or less elevated ridges on occiput); scales of crest flattened, compressed, highest at back level of head and continuous with a low serrate crest on dorsum; lateral scales distinctly smaller than ventral scales, more or less keeled, the scales pointing backward and downward; scales on side of neck pointing up or up and back; ventral scales, scales on limbs and tail keeled, mucronate, the mucrone



heavy, distinct; throat with a suggestion of a pouch, the median scales slender with strong mucrones; mental with a labial border equal to that of rostral; supralabials, 9-9, infralabials, 8-8; when leg is brought forward the toes reach halfway between eye and nostril; a rather large area of fine granular scales in front of arm insertion on side of neck; base of tail swollen, surrounded by 15 rows of scales; approximately 43 scale-rows around middle of body; tympanum large.

*Color:* Olive or greenish in life, becoming dirty grayish blue on head and on body and limbs; back part of head and neck region gray olive; tail distinctly greenish olive; infralabials bluish; a black mark along supralabials, leaving a series of tiny bluish spots on labials; a light line below eye to tympanum bordered above by light.

MEASUREMENTS IN MILLIMETERS OF *CALOTES NIGRILABRIS* PETERS

Museum.....	EHT-HMS	USNM	USNM	USNM	EHT-HMS
Number.....	30502	58666	38281	38282	30503
Locality.....	Nuwara Eliya	"Ceylon"	Nuwara Eliya	Nuwara Eliya	Nuwara Eliya
Sex.....	♂	♂	♂	♀	♀
Snout-to-vent length	92	86	86	83	75
Tail length.....	293	264	197+?	238	205
Head length.....	32.2	30.5	29.5	26	25
Head width.....	22.3	19.2	19	15	14.6
Axilla to groin.....	43	36?	43	45	41
Arm.....	51.5	53	49	46.5	42
Leg.....	84	72	71	64	63.5

*Remarks:* The coloration varies in life but usually it is uniform green with a broad black band along the lips to behind the tympanum; tail brownish with darker-bordered light band or spots. Sometimes the lips are green as is the remainder of head and body.

A female specimen in the collection differs in being olive brown above with two chevronlike bands across shoulders pointing backwards. The remainder of the dorsum has small white spots, the tail a series of cream, brown-edged spots. The nuchal crest of the female is low, and the dorsal crest is scarcely discernible. In this



specimen the toe reaches to the orbit. There are two eggs in each oviduct.

*Calotes ceylonensis* Müller

*Calotes mystaceus ceylonensis* F. Müller, Verh. Naturf. Gesellsch. Basel, vol. 8, 1887, p. 292, pl. 3 (type locality, Kumbukan-aar, southwest Ceylon).

*Calotes* Haly, Taprobanian, vol. 2, pt. 5, Oct. 1887, p. 133 (described, but not named).

*Calotes kelaartii* Nevill, Taprobanian, vol. 2, 1887, p. 134 (type locality, by inference, North Western Province, Ceylon—species named but not described. The description is that of Haly.)

*Calotes ceylonensis* Boulenger, The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, pp. 139-140; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 151-152; Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 202-203.

*Calotes saleoides* Werner, Verh. Zool-bot Ges. Wien, vol. 46, 1896, p. 7 (type locality, Ceylon).

**Diagnosis:** A diagonal, pitlike depression in front of shoulder, its surface covered by small tubercular scales; rows of scales on sides of dorsum directed backwards and downwards; two separated spines on occiput above and somewhat forward of the tympanum; a nuchal crest but no dorsal crest; scales about body, 54 to 60; none of the scale rows directed downward.

**Description of species:** (E.H.T.-H.M.S., No. 30576, ♀, "Ceylon"). Rostral small, flanked by two labials, bordered behind by four scales, its width a little greater than its height; nasal separated from rostral by two scales; supranasals larger than other scales on dorsal part of snout, equaling or nearly equaling the nasal; supralabials, 10-10; infralabials, 10-9; inner row of scales bordering the supralabials not strongly defined, separated by three scale-rows; supraoculars about 20, irregular; five superciliaries, canthal series of four scales partly interrupted; tympanum more than half length of eye opening; a pair of erect, soft spines above the tympanum; a low nuchal crest (female) beginning on a level with the more anterior of the two spines; depression or pit on shoulder distinct, its surface covered with small imbricating scales; scales on snout directed forward or outward, irregularly ridged; scales on nuchal region with small tubercles; on dorsum scales larger than those on ventral surface, the two rows bordering the nuchal spines largest; upper lateral rows directed back and upwards; others directed straight back, all more or less keeled; all scales on ventral regions keeled; leg reaches to tympanum; approximately 54 scales around middle of body; no gular sac.

**Color:** Head dark brown above; a light stripe from nostril back across area below eye to tympanum; dorsum light brown, barred with bands of varying width, those more posterior may be six scales



long; sides with some brown blotches and on flanks the lighter ventral color encroaches; tail dimly barred brown and light brown; some brown flecks on chin.

*Measurements in mm.:* Length, snout to vent, 72; tail, 155; length of head, 21; width of head, 13; axilla to groin, 37; arm, 31; leg, 50.

*Remarks:* Males differ considerably in having the cheeks inflated or swollen and presumably the head scales are smoother. The nuchal crest is much higher and stronger and the base of the tail is swollen and covered with large thickened scales, the median forming a serrated edge.

The color of the male is olivaceous, the back of head and front of the dorsum being more or less pinkish or reddish in life. Some transverse darker bars may be present and a pale stripe passing from below the eye to the end of the jaw is usually discernible.

This species occurs chiefly in lowland forest in the northern half of the Island.

### *Calotes liolepis* Boulenger

*Calotes nemoricola* Günther, Proc. Zool. Soc. London, 1869, p. 507 (not of Jerdon).

*Calotes liolepis* Boulenger, Catalogue of the Lizards in the British Museum, vol. 1, 1885, pp. 326-327 plate 25, fig. 2 (type locality, Ceylon); Nevill, Taprobanian, vol. 2, pt. 5, Oct. 1887, pp. 133-134 (Kandy, Kotmali); Boulenger, The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 140; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 152-153; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, p. 203 (Punduluoya, Kandy, Gammaduwa).

*Diagnosis:* A species having a pair of soft, spinelike scales above and forward of tympanum; a nuchal crest narrowly separated from a short dorsal crest; scales on sides of neck pointing upward; those on sides of body pointing backward and downward; scales on chin, throat and venter with minute mucrones, and sometimes additional, minute, hairlike, posterior projections; scales about base of tail largest; leg reaches to tympanum; an area of small tubercular scales on shoulder, tending to form a pit.

*Description of species:* (From K.U.M.N.H. No. 19533, "Ceylon.") Rostral small bordered by two labials and three postrostrals; nostrils occupying half surface of nasal scales; nasals separated from rostral by two scales; a large supranasal; five scales on canthal edge behind nasal; scales on head as far back as occiput smooth, unequal; rows of large scales outline orbits, separated from each other by three scale-rows; three elongate superciliaries; supraorbitals very large, irregular; scales on occiput and in anterior nuchal region each bearing an elevated tubercle; approximately 32 scales around middle



of body; nuchal crest with eight, soft, compressed spines, the largest five to eight millimeters in length; two soft spines, one directly above, one anterior to level of naked tympanum; area about jaw angles swollen; a short dorsal crest consisting of eight or ten, soft, small, posteriorly directed spines; scales on base of tail larger than body scales; scales on sides pointing back and downward, not keeled. Third and fourth toes nearly of equal length; toes reaching to tympanum.

*Color:* In preservative, head light reddish brown, the color extending to tympanum but the swollen areas at jaw angles blackish; nuchal crest and occipital spines black; dorsum blackish brown with three indistinct transverse lighter bands on back; throat and neck blackish, the anterior part of chin lighter; venter lighter than sides.

*Measurements in mm.:* Snout to vent, 82; tail, 212; length of head, 30.5; width of head, 19; arm, 40.5; leg, 59.

#### Family SCINCIDAE Gray

The Ceylonese species of this family have recently been reviewed by me, and specimens in the collections reported on. Since this paper is readily available,\* I am not repeating this data here other than to repeat the keys, since workers may find it convenient to have an entire listing of the species under a single cover. The following species are known:

Mabuya bibronii	Sphenomorphus taprobanense
Mabuya macularia	Sphenomorphus fallax
Mabuya beddomii	Sphenomorphus rufogulus
Mabuya floweri	Chalcidoseps thwaitesi
Mabuya carinata	Nessia burtonii
Mabuya madarászi	Nessia didactyla
Riopa punctata	Nessia monodactyla
Riopa singha	Nessia bipes
Dasia haliana	Nessia sarasinorum
Sphenomorphus dussumieri	Nessia hikanala
Sphenomorphus megalops	Nessia layardi
Sphenomorphus deignani	Nessia deraniyagalai
Sphenomorphus striatopunctatus	

#### KEY TO THE GENERA OF SCINCIDAE IN CEYLON

1. Palatine bones in contact or overlapping along medial palatal line,	2
Palatine bones not in contact along medial palatal line . . . . .	6
2. Supranasals present . . . . .	3
Supranasals absent . . . . .	5

\* *Ceylonese Lizards of the Family Scincidae*, Univ. of Kansas Sci. Bull., vol. 33, pt. 2, Mar. 20, 1950, pp. 481-518.



3. Scales keeled with 2 to 7 keels . . . . . 4  
Scales smooth; body somewhat elongated; limbs pentadactyl,  
but short, widely separated when adpressed; scales smooth;  
lower eyelid with a semitransparent disk . . . . . *Riopa*
4. Pterygoid bones not in contact, the palatal notch extending for-  
ward to level of centers of eyes; limbs pentadactyl, well de-  
veloped, distinctly overlapping when adpressed; no distinct  
transverse bands . . . . . *Mabuya*  
Pterygoid bones in contact anteriorly, the palatal notch not reach-  
ing forward to level of centers of eyes. Limbs pentadactyl,  
failing to touch or barely overlapping when adpressed; color  
pattern of transverse bands . . . . . *Dasia*
5. Limbs pentadactyl, meeting, overlapping or failing to meet when  
adpressed; lower eyelid scaly; frontoparietal single or double;  
scales smooth or at most, with slight suggestion of keels or  
striations . . . . . *Sphenomorphus*  
Limbs not pentadactyl, greatly reduced or absent; body angui-  
form; the nostril in rostral . . . . . 6
6. Nostril in anterior part of rostral, connected to the posterior edge  
of scale by a groove; limbs variable, never tetradactyl . . . . . *Nessia*  
Nostril near the posterior edge of rostral; limbs short, tetradactyl,  
*Calcidoseps*

### Genus MABUYA Rafinesque

Six species occurring in Ceylon may be differentiated by the following key:

#### KEY TO SPECIES OF MABUYA IN CEYLON

1. A transparent disc or lower eyelid . . . . . *bibronii*  
No transparent disc, but several larger transparent scales on  
lower eyelid . . . . . 2
2. A postnasal . . . . . *macularia*  
No postnasal . . . . . 3
3. Scales almost smooth or with three to five very feeble keels . . . *beddomii*  
Scales not smooth, each bearing 3, 5 or 7 strong keels . . . . . 4
4. Scales tricarinate (or sometimes also with a small tubercle on  
outer edge of scale); dorsum with a paired series of black  
markings . . . . . *floweri*  
Scales with five or seven keels (except very young which may  
have three); no paired series of black markings on dorsum . . . . . 5
5. Larger; snout to vent, 123 mm.; adpressed hind limb to wrist or  
elbow . . . . . *carinata*  
Smaller; snout to vent, 77 mm.; adpressed hind limb to axilla or  
farther . . . . . *madarászi*

### Genus RIOPA Gray

Two species occurring in Ceylon may be differentiated by the following key:



## KEY TO THE SPECIES OF RIOPA IN CEYLON

Scales 24-26 rows, each dorsal and lateral scale with a dark spot.  
In young, spots forming 6 dark lines separated by light lines;  
tail uniform red; dorsolateral light lines from rostral,

*Riopa punctata*

Scales in 28 rows; four very narrow dark lines on median scale  
rows; dorsolateral lines from supraoculars; vertical rows of  
white spots on neck and scattered white spots on the sides;  
a dorsolateral line from nuchal. . . . . *Riopa singha*

## Genus DASIA Gray

A single endemic species, *Dasia haliana*, occurs in Ceylon. The characters being those of the genus.

## Genus SPHENOMORPHUS Fitzinger

Seven species from Ceylon are referred to this genus. They may be differentiated by the following key:

## KEY TO THE SPECIES OF SPHENOMORPHUS IN CEYLON

- |  |                         |
|--|-------------------------|
| 1. Frontoparietal divided . . . . .  | 2                       |
| Frontoparietal single . . . . .  | 6                       |
| 2. Less than thirty scale rows about body . . . . .  | 3                       |
| Forty scale rows about body . . . . .  | <i>dussumieri</i>       |
| 3. Parietals enclosing interparietal . . . . .   | 4                       |
| Parietals separated by interparietal . . . . .   | <i>megalops</i>         |
| 4. Dorsal scales striated . . . . .  | <i>deignani</i>         |
| Dorsal scales unstriated . . . . .   | 5                       |
| 5. Adpressed limbs barely overlap; prefrontals forming a common<br>suture . . . . .            | <i>taprobanense</i>     |
| Adpressed limbs separated by seven scales; prefrontals usually<br>separated . . . . .          | <i>striatopunctatus</i> |
| 6. Males with sides of head and throat blue-black, each scale with<br>a whitish spot . . . . . | <i>fallax</i>           |
| Males with throat bright, rosy red, lacking black color and white<br>spots . . . . .           | <i>rufogulus</i>        |

## Genus CHALCIDOSEPS Boulenger

A single species *Chalcidoseps thwaitesi* Günther is known in Ceylon. The characters are those of the genus.

## Genus NESSIA Gray

The following key will differentiate the eight forms recognized under specific names:

## KEY TO THE SPECIES OF NESSIA

- |   |   |
|---|---|
| 1. Two or four limbs present; interparietal broader than frontal<br>(except <i>sarasinorum</i> ); ear opening present . . . . . | 2 |
| Limbs absent . . . . .  | 6 |



- |  |                      |
|--|----------------------|
| 2. Limbs bearing clawed digits.....  | 3                    |
| Limbs budlike, lacking clawed digits.....  | 4                    |
| 3. Four limbs present, tridactyl; 24 scales at midbody.....  | <i>burtonii</i>      |
| Four limbs present, didactyl; 24 scales at midbody.....  | <i>didactyla</i>     |
| 4. Four limbs present; 24-26 scales about midbody.....   | <i>monodactyla</i>   |
| Two limbs present; scales variable.....  | 5                    |
| 5. Scale rows about midbody, 28.....   | <i>bipes</i>         |
| Scale rows about midbody, 22; interparietal narrower than frontal.....   | <i>sarasinorum</i>   |
| 6. Snout flattened below, projecting sharklike; frontonasal one third width of rostral; ear-opening present..... | <i>hickanala</i>     |
| Snout not especially flat, not sharklike; frontonasal more than half length of rostral.....                      | 7                    |
| 7. One large elongate loreal; preoculars small; frontonasal nearly as long as rostral.....                       | <i>layardi</i>       |
| Two loreals, the posterior lower than anterior; frontonasal a little more than half of rostral length.....       | <i>deraniyagalai</i> |

### *Sphenomorphus fallax* Peters

*Lygosoma fallax* Peters, Monatsb. Akad. Berlin, 1860, p. 184, (Ratnapura, Trincomalee, Ceylon); Taylor, Univ. Kansas Sci. Bull., vol. 33, pt. 2, no. 13, Mar. 20, 1950, pp. 501-504, fig. 4, A and B.

I have recently received a series of specimens from Tonacombe Estate, Namunukula, Ceylon, 4000 ft. elev. These were not available when the lizard report was made.

The specimens are K. U. M. N. H. Nos. 31276-31286. The females of the species show a fairly well-defined pair of dorsolateral lines, covering halves of two scale rows (third and fourth from middle of dorsum); this bordered laterally by a broad, dark stripe beginning at nostril, passing through eye to side of tail, one whole scale-row and two half scale-rows wide; the adjoining four rows with a narrow lighter line through their middle, the four median dorsal rows each may have a narrow indistinct, lighter line. The light lines continue on the tail; venter white.

Males with sides of head and throat blue, each scale with a milk-white or bluish white spot.

The lineation on the body is lost in older males and no trace is evident. The males seemingly are a little larger than females, with a somewhat larger head proportionally.

### Family LACERTIDAE Gray

#### Genus CABRITA Gray

*Cabrita* Gray, Ann. Mag. Nat. Hist., vol. 1, 1838, p. 282, (type of genus, *Cabrita brunnea*).

This genus, which ranges in southern India is represented by a single species in Ceylon. It is presumably confined to the lower, dryer parts of northern Ceylon.



*Cabrita leschenaultii* Milne-Edwards

*Lacerta leschenaulti* Milne-Edwards, Ann. Sci. Nat. Paris, vol. 16, 1829, pp. 80, 86; pl. 6, fig. 9, (type locality, Coromandel Coast, India).

*Cabrita leschenaulti* Boulenger, Catalogue of the Lizards of the British Museum, 2nd ed., vol. 3, 1887, p. 70; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 172; Monograph of the Lacertidae, vol. 2, 1921, p. 194; Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 157, pl; Smith, The Fauna of British India including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, 1935, pp. 374-375.

*Diagnosis:* (from Smith, *loc. cit.*) Anterior labials ridged, forming a projecting margin; upper head scales strongly keeled and finely striated; canthus rostralis sharp; a single frontonasal; nostril between two swollen nasals; one or two postnasals; prefrontals in contact mesially; frontal long and narrow touching first three supraoculars; interparietal small touching a smaller occipital; four supraoculars; dorsal scales subequal, smaller than caudals; ventrals in six longitudinal rows, in 24-28 transverse series; 42 to 50 scales around body at middle; a large preanal plate; 12-16 femoral pores on each side.

Brownish or golden above; a light stripe, edged above with black behind superciliary edge, passes along body to tail; a second light line borders upper lip, and passes along to flank; a black stripe between light lines (or green, spotted black); greenish white on venter; snout to vent, 50 mm.; tail 100 mm.

## Family VARANIDAE

## Genus VARANUS Merrem

*Varanus* Merrem, Tentamen Systematis Amphibiorum, 1820, p. 58 (type of genus, *Lacerta varia* Shaw).

This genus comprises the largest living lizards, one species reaching a length of 10 or more feet. Two species are known from Ceylon, a smaller *Varanus begalensis begalensis* Daudin, which reaches a length of nearly 6 feet, and *Varanus salvator* Laurenti, even larger, reaching a length of eight feet, four inches. These animals run rapidly, often climbing trees and often actually living in hollow trees.

## KEY TO CEYLONESE SPECIES OF VARANUS

- Nostril round or oval, nearer tip of snout than to orbit; abdominal scales weakly keeled, in 80 to 90 transverse rows. . . . *salvator salvator*  
 Nostril a rather narrow slit directed backwards, nearer orbit than tip of snout; abdominal scales smooth, in 90-110 transverse rows . . . . . *begalensis begalensis*



*Varanus bengalensis bengalensis* (Daudin)

*Tupinambis bengalensis* Daudin, Histoire Naturelle des Reptiles, vol. 3, p. 67 (type locality, Bengal).

*Lacerta monitor* Linnaeus, Systema Naturae, ed. 10, 1758, p. 201 (type locality, India).

*Monitor dracaena* Kelaart, Prod. Faun. Zeylanicae, 1853, p. —.

*Varanus bengalensis* Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 2, 1885, p. 310 (Ceylon); The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1895, pp. 164-165 (Ceylon, "Whole of India"); Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 161; Bhatt, Animal Life (Colombo Ceylon) 1942, pp. 118, 120 (native name only).

*Varanus (Indo)varanus bengalensis bengalensis* Mertens, Abh. Senckenb. Naturf. Gesellsch. No. 462, 1942, pl. 3, figs. 9, 10; pl. 11, fig. 49; pl. 13, figs. 64, 67; *ibid.* No. 465, 1942, pp. 182-184, pl. 22, figs. 160-161; pl. 25, figs. 194-196; pl. 29, figs. 232-234; pl. 32, figs. 258-259; pl. 34, figs. 285, 287; *ibid.* No. 466, pp. 334-338.

**Diagnosis:** A large species reaching six feet in total length; ventral scales smooth; no widened scales in supraorbital series; nostril a narrow slit, nearer orbit than to tip of snout.

**Description of species:** Rostral as high as wide, bordered laterally by first labials, bordered behind by a pair of postrostrals; largest scales on head form three median rows between the orbits, the adjoining rows somewhat smaller; a median groove begins two scale-lengths behind rostral and extends behind anterior level of nostril; supraorbital scales somewhat wider than other scales, one or two of which may be widened; canthus rather obtuse; supralabials, 31; approximately 34 infralabials; mental larger than rostral, followed by four somewhat enlarged scales separated by a groove which continues back for some distance; ear-opening subtriangular, the distance between eye and ear distinctly greater than distance from eye to anterior end of nostril; 32 scales between rostral and parietal; latter bearing pineal or parietal eye; between occipital and a point above the vent, 158 scales; between nuchal fold and line joining front level of legs, 104 smooth scale rows; leg when adpressed fails to reach axilla.

Digits below with transverse series of small scales, at least 30 series under the fourth toe, one row on inner edge enlarged on basal region; 20 series under first toe.

**Color of young:** Olive to brown with short black lines or spots, those on head longitudinal, those on body tending to form narrow transverse bands; sides, and to a lesser extent back, with small dark spots having yellow centers; a distinct black stripe behind eye; chin and neck more or less transversely marked with black; belly indistinctly marbled, with irregular transverse lines somewhat in evidence; toward distal part of tail there is a broad cream band with



some darker lines or marbling (one or two specimens also have tip of the tail cream color).

Adults usually dull, blackish brown, or, recently after shedding, some yellowish may be in evidence.

*Varanus salvator salvator* (Laurenti)

*Stellio salvator* Laurenti, Specimen medicum exhibens Synopsin Reptilium emendatum, 1868, p. 56 (based on plate 88, fig. 2 in vol. 2, Seba, Thesaurus, a species of unknown provenance).

*Varanus salvator* Boulenger, Catalogue of the Lizards in the British Museum, 2nd ed., vol. 2, 1885, p. 314; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 166. Deraniyagala, Ceylon Journ. Sci., B, vol. 16, 1931, p. 159; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2; Sauria, 1935, pp. 406-407; Deraniyagala, Spolia Zeylanica, vol. 24, pt. 1, 1944, pp. 59-62.

*Varanus salvator salvator* Mertens, Abh. Senckenb. Natur. Gesellsch. no. 466, 1942, pp. 245-253; (*ibid.* Abh. 462, 1942, pl. 2, fig. 5; pl. 5, figs. 19-21; pl. 15, fig. 85; pl. 16, fig. 103.)

*Diagnosis:* Snout depressed at end, its length three times its height; canthus rostralis distinct but somewhat rounding; rostral small, as wide as high bordered by a pair of postrostrals; nostril round or oval in shape, much closer to tip of snout than to the eye; scales on crown of head larger than nuchal scales; four to eight median supraoculars transversely enlarged; scales of dorsal surface oval, more or less keeled; abdominal scales keeled in 85-95 rows; tail strongly compressed laterally, with a crest composed of paired scales ("doubletoothed"); tongue very long, divided, snakelike. Total length more than eight feet (2500 mm. *vide* Malcolm Smith).

*Color:* Adults dark brownish olive, usually indistinctly marked with transverse series of yellow spots.

SUBORDER—RHIPTOGLOSSA

Family CHAMAELEONIDAE Gray

Genus CHAMAELEON Gronovius

*Chamaeleon Gronovius*, Zooph. Anim., vol. 1, 1763, p. 12 (type of genus, *Lacerta chamaeleon* Linnaeus).

A single species occurs in Ceylon.

*Chamaeleon zeylanicus* Laurenti

*Chamaeleo zeylanicus* Laurenti, Specimen medicum exhibens Synopsin Reptilium emendatum, 1768, p. 46 (based on a figure in Seba, Thesaurus, vol. 1, pl. 82, fig. 3).

*Chamaeleon calcaratus* (*part.*) Boulenger, Catalogue of the Lizards in the British Museum 2nd ed., vol. 3, 1887, p. 445, pl. 39, fig. 2; The Fauna of British India, including Ceylon and Burma; Reptilia and Batrachia, 1890, p. 232, text figs. 66, 67; Werner, Zool. Jahrb., vol. 15, 1902, p. 332; Deraniyagala, Ceylon Journ. Sci., B, vol. 15, 1931, p. 156.



*Chamaeleon zeylonicus* Jerdon, Journ. Asiat. Soc. Bengal, vol. 22, 1853, p. 466; Smith, The Fauna of British India, including Ceylon and Burma; Reptilia and Amphibia, vol. 2, Sauria, Feb. 7, 1935, pp. 251-253.

*Diagnosis:* Foot with digits in groups of two and three opposed to each other; tongue club-shaped and extremely extensive, (nearly as long as head and body); head casque elevated posteriorly with a parietal crest, a serrated dorsal crest and a median ventral crest on chin, throat and venter.

*Description of species:* Head large, decorated with two elevated lateral crests beginning on the snout, following canthus rostralis to above eye, and temporal region, where they become lost on side of a high, parietal crest; parietal crest begins between eyes at their back level, and rises rapidly to the median highest point of the bony casque; latter sharply truncate on neck; width of casque at widest part slightly less than width of head at jaw angle; eyelids with a narrow median opening, closely applied to the somewhat conical eyeball; ear completely covered, but a slight depression suggests its position; diameter of bony orbit of eye equal to its distance from tip of snout; supralabials, 25-25; infralabials, 27, the last four not differentiated from other head scales; rostral and mental not differentiated from labials.

Scales on head unequal, relatively larger than scales on body and chin; body strongly compressed laterally leaving no ventral surface except a crest; dorsum likewise merely a high crest somewhat serrate, supported by neural spines of vertebrae covered with scales that are much larger than those on sides and limbs; feet with the upper three toes grouped together, directly opposed to lower two, all strongly clawed, and bound together, only the tips free; tail slender, compressed, higher than wide, decurving, prehensile.

*Color:* Green in life; in preservative nearly uniform blackish on body, the median dorsal crest and head somewhat grayish, the median ventral crest white or cream; palms and soles cream or yellowish, without pigment; under part of tail lighter than its sides.

*Measurements in mm.:* Length, snout to vent, 191; tail, 245, total length, 436; width of head, 34; head length to back level of casque, 51; back of jaw to snout tip, 40; arm, 84; leg, 84.

*Remarks:* A specimen (K.U.M.N.H. No. 24137, from Puttalam, Ceylon, W. C. Osman-Hill collector) has furnished the preceding description. The species is probably confined to the lower, dryer forests in the northern half of the island.



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