NOTES ON LIZARDS IN THE INDIAN MUSEUM.

I. On the unnamed collection of Lizards of the family Geckonidae.

By Sunder Lal Hora, *D.Sc., Officiating Superintendent, Zoological Survey of India.*

During the last decade or so a large collection of unnamed lizards from India and other parts of Asia has accumulated in the Indian Museum and while identifying this fresh material, I have come across several interesting points regarding certain species. In the present series of notes only those species are discussed whose existing descriptions require amplification in view of the fresh material examined. For any further details Boulenger's comprehensive works and Annandale's notes on the Oriental Herpetology may be consulted. It may, however, be pointed out that through the efforts of the late Dr. Annandale our named collection of lizards is very representative of the Indian fauna and is in a very good condition.

I have here followed the order in which families, genera and species are described in Boulenger's volume on Reptilia and Batrachia in the Fauna of British India series for convenience of reference.

Genus **Gymnodactylus** Spix.

Since Annandale's monograph[1] of the Indian species of this genus two new species have been described from within the limits of the Indian Empire, one from the Western Himalayas[2] and the other from Waziristan.[3] Annandale[4] recorded the occurrence of *G. lawdranus* in the Kumaon Hills and definitely assigned it a position somewhat near *G. stoliczkae.* Loveridge[5] has quite recently contributed a short paper on the mite pockets in certain Indian species of *Gymnodactylus* and has recorded the presence of five specimens of *G. lawdranus* in the collection of the Museum of Comparative Zoology, Cambridge, Mass, U. S. A., from Ambala and the Kulu valley.

In order to throw further light on the observations made by Loveridge I have very carefully examined our entire collection of *Gymnodactylus* for mites and have found them in the arm-pits of *G. fasciolatus* and *G. triedrus.* The number of mites has been very small not exceeding five in each arm-pit and the pits are not well developed. In *G. lawdranus* and *G. kachensis* the pits are well marked, but in *G. scaber, G. khasiensis* and *G. consobrinus* they are only slightly developed. In all other species examined (see Annandale's paper for list of species) no

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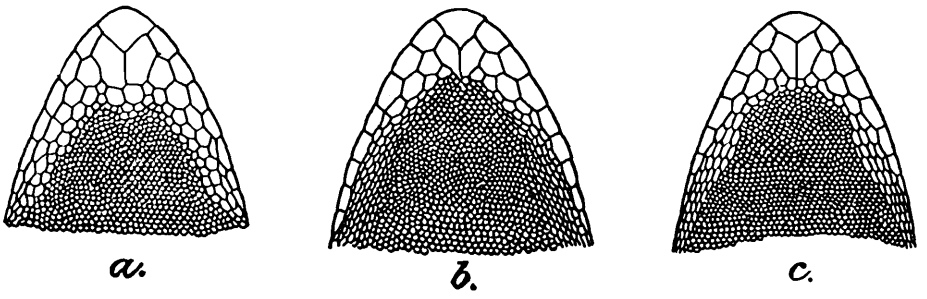
[1] Annandale, *Rec. Ind. Mus.* IX, pp. 310-326, pls. xvi, xvii (1913).
[2] Ingoldby, *Journ. Bombay Nat. Hist. Soc.* XXVIII, p. 1051 (1923).
[3] Miss Procter, *Journ. Bombay Nat. Hist. Soc.* XXIX, p. 121 (1924).
[4] Annandale, *Rec. Ind. Mus.* X, p. 319 (1914).
[5] Loveridge, *Proc. Zool. Soc. London,* pt. IV, p. 1431 (1925).

arm-pits of any nature have been found. It is rather difficult, as Mr. Loveridge has already pointed out, to attach any great importance to this character because it is extremely liable to variation both on the excellence or otherwise of the preservation of the specimens, and on the nature of the preservative used.

Gymnodactylus albofasciatus Boulenger.

1913. *Gymnodactylus albofasciatus*, Annandale, *op. cit.*, p. 322.

This species exhibits striking similarities in build and colouration to *Gymnodactylus deccanensis* but Boulenger[1] separated it from the latter on the following characters, " The dorsal pholidosis is not composed of uniform large tubercles, but of intermixed smaller and larger tubercles, the latter being mostly feebly keeled ; the small scales on the limbs and upper part of the tail intermixed with larger keeled tubercles. The ventral scales are larger, tubercular and feebly keeled. No chin-shields behind the median pair. The tubercular plates under the basal phalanx of all the digits much more developed. The ground colour of the upper parts is darker than in our specimens of *G. deccanensis*, chestnut-brown." When Annandale wrote his monograph on *Gymnodactylus*, there was in our collection a single specimen of *G. albofasciatus*, probably a co-type, and two examples of *G. deccanensis*, one of which was obtained in exchange from the British Museum. The diagnostic characteristics mentioned by Boulenger for the two species are quite apparent in these three specimens, but since 1913 we have received six examples from N. Canara which are referable to *G. albofasciatus* but differ from it in several points, the most important being the presence of chin-shields behind the median



TEXT FIG. 1.—Chin shields of *Gymnodactylus deccanensis* and *G. albofasciatus*.
a. G. deccanensis ×2 ; *b. G. albofasciatus* (B. M. specimen) ×2 ; *c. G. albofasciatus* (Castle Rock specimen) ×2.

pair. The larger tubercles on the dorsal surface in almost all the fresh specimens are relatively much smaller than those found in the three specimens mentioned above, and the scales on the ventral surface correspond to those of *G. deccanensis*. The tubercular plates under the basal phalanx of all the digits are, however, better developed. Out of the fresh material the four specimens from Castle Rock possess a very dark ground colour on the upper surface, while the other two from Karmal, a place situated only 6½ miles from Castle Rock, are much lighter in colour.

[1] Boulenger, *Brit. Mus. Cal. Lizards* I, p. 37 (1885).

From an examination of the fresh material, it seems quite probable that when large series of individuals of the species are examined, the differences noted by Boulenger and those characterizing the fresh material will vanish altogether. It may then be possible to distinguish local races of *G. deccanensis* but at present I have not enough material to combine the two species. From the material before me they can be distinguished by the nature of their colour bands. In *G. deccanensis* the white bands are relatively much broader and possess well-defined, fairly broad black margins.

Measurements in millimetres of two specimens from Castle Rock.

Total length	134·7	96·5
Length of tail	61·2	47·0
Length of body	51·5	34·9
Length of head	22·0	14·6
Width of head	15·5	10·6
Length of snout	8·3	6·0
Diameter of eye	5·2	4·0
Distance between eye and ear opening	7·4	4·7
Fore limb	29·0	17·3
Hind limb	35·0	21·5

Gymnodactylus khasiensis (Jerdon).

(Plate VII, figs. 4—6.)

1913. *Gymnodactylus khasiensis*, Annandale, *op. cit.*, p. 319.

I hesitatingly refer to this species a female specimen in our collection from Gopaldhara in the Darjeeling District. Its general form and build is very similar to *Gymnodactylus khasiensis* but its colouration is well marked and very characteristic. For convenience of reference I give below a short description of its colouration and measurements together with figures.

There are six rows of greatly elongated spots forming more or less continuous longitudinal stripes on the dorsal and dorso-lateral surfaces of the animal. The four of these stripes on the dorsal surface begin near the tip of the snout and are continued backwards on to the tail, which has been partially regenerated. The central stripe on each side passes through the eye. The outermost stripe on each side is short and is restricted to the region between the shoulder and the hip joint, it consists of short and irregular spots. There are short cross bars at irregular intervals, joining these stripes together. A series of similar spots is present on the upper surface of the limbs forming an irregular pattern. The under surface is dull white. Most of the dorsal tubercles possess black tipped keels.

Measurements in millimetres.

Length of body	48·5
Length of head	18·0
Width of head	12·3
Length of snout	7·1
Diameter of eye	4·0
Distance between eye and ear opening	5·5
Length of fore limb	25·0
Length of hind limb	30·0

Gymnodactylus khasiensis is found in North-eastern Burma, Assam and in the Eastern Himalayas (Darjeeling District).

Gymnodactylus sp.

(Plate VII, figs. 1—3.)

While examining the named collection of *Agamura* in the Indian Museum I have found confused with it several specimens of *Alsophylax tuberculatus* and one completely dessicated and badly damaged specimen of *Gymnodactylus*, which I am unable to refer to any known species. These specimens do not bear any locality numbers, but it seems quite probable that they formed a part of Blanford's Persian collection.

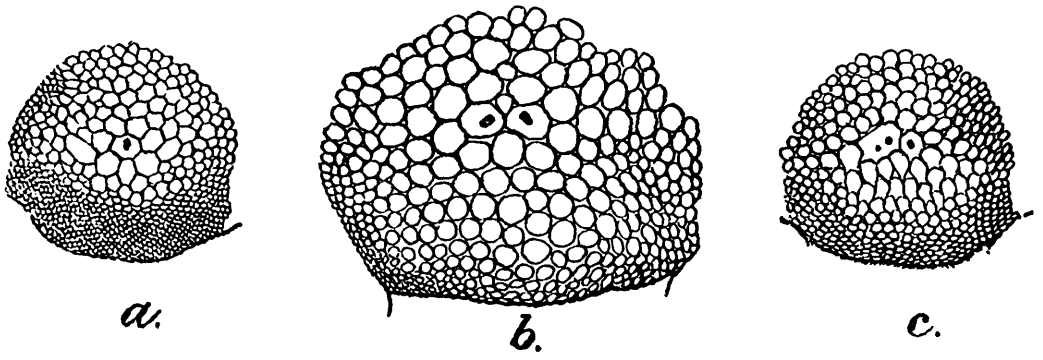
The sharply keeled, trihedral tubercles on the back are arranged in 12 series in the middle of the body. The tail appears to be divided into distinct rings and each ring bears four well-marked, sharply-pointed, large and keeled tubercles on each side near the commencement of the tail while there are only 3 rows of spines on each side later on. There are no tubercles on the mid-dorsal surface of the tail. The sub-caudal plates are rectangular and well-developed. They are grooved and keeled in various ways and in this respect are very characteristic. The limbs are also covered with sharp, keeled tubercles. The scales on the under surface are small, more or less circular and slightly imbricate.

There are three preanal pores and no femoral pores.

There are about eight transverse black bands across the dorsal surface of the body and several similar bands on the portion of the tail present. The limbs and the head are also spotted.

Genus **Agamura** Blandford.

Only two species have hitherto been described under this generic denomination and both of these exhibit striking similarities in general form, habits and colouration. *Agamura cruralis* and *A. persica* have



TEXT FIG. 2.—The preanal pores in *Agamura persica.*

a. Specimen No. 1189 showing one pore ×3½; *b,* Specimen No. 3501 showing normal condition ×3½; Specimen No. 15243 showing three pores ×4⅔.

been separated from each other both by Blanford[1] and Boulenger[2] on a number of apparently important characters. But later on Boulenger[3]

[1] Blanford, *Eastern Persia* II (Zoology and Geology), pp. 355-359, pl. xxiii, figs. 3, 3*a*, 4*a*, 4*b* (1876).

[2] Boulenger, *Brit. Mus. Cat. Lizards* I, pp. 50, 51 (1885).

[3] Boulenger, *Trans. Linn. Soc.* (2) Zoology V, p. 95 (1889).

in his report on the Reptiles and Batrachians of the Afghan Delimitation Commission has pointed out that the differences hitherto believed to exist between the two species are less important. The examination of the material in our collection has convinced me that the two species are identical and as regards tubercles on the snout, the form and extent of the rostral and mental shields and the presence or absence of enlarged convex tubercles on the upper parts of thigh and tarsus the individuals show considerable variation.

The specimens before me can, however, be separated in to two groups, firstly those with long limbs and preanal pores and secondly those with short limbs and without preanal pore. The former in my opinion represent the males of *A. persica* while an examination of all the eight specimens of the latter form shows that they are females.

The number of preanal pores varies from one to three, the usual number being two. There is one specimen in our collection with 3 pores piercing two enlarged scales. The scale bearing two pores is much larger and is of a peculiar shape. In two specimens there is only one pore.

In the following table I give the localities from where the male and female specimens of *Agamura persica* are represented in our collection.

Agamura persica ♂.

3487	Mand, Baluchistan	Persian collection (W. T. Blanford).
3486, 6812	Zamran, Nibing River	Do.
3501	Mand, Baluchistan	Museum collector.
6811	Askan nr. Bampusht	Persian collection (W. T. Blanford).
19656	Near Shibian Pass (4000 ft.)	F. P. Maynard and Capt. MacMohan.
17081	Las Bela, Baluchistan	Zugmayer.
15243	Kohak, Perso-Baluch Frontier	Seistan Commission.

Agamura persica ♀.

13938, 13940, 13948	Baluchistan	F. P. Maynard.
13109	Hamoon Khusa	Afghan Boundary Commission.
3460	S. Persia	Persian collection (W. T. Blanford).
3461	Rayin, S. E. Persia	Do.
19655	Lab-i-Baring, Seistan	N. Annandale.
19648		?

Genus **Gonatodes** Fitzing.

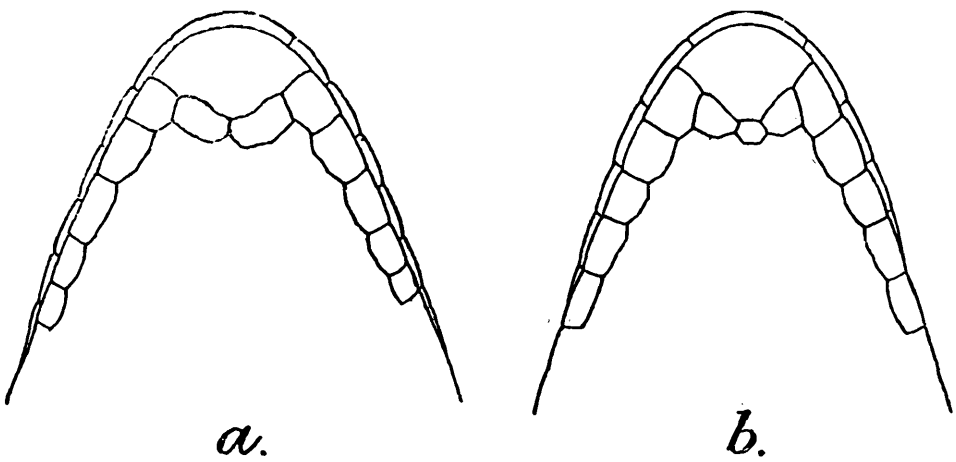
(Plate VII, fig. 7.)

In our unnamed collection there have been in all nine specimens of this genus from S. India. Of these two belong to *Gonatodes wynadensis* and were collected by Dr. Annandale and Major Sewell near Law's Falls, below Conoor, while the remaining examples are referable to *G. gracilis*. Four specimens of the latter species are from the neigh-

bourhood of Nierolay and Mettupalaiyam and are typical in every respect, but the others from Terkumalai, Courtallum are much darker in colouration. The whole of the upper surface is banded with black and white bars and the same pattern is present on the limbs. The under surface is dull white except in the region of the head where there are longitudinal stripes on the sides.

The specimens of the three Indian species with small spine-like tubercles on the flanks have been greatly confused in our collection. I give below the localities whence specimens of the three species are represented in our Museum.

Gonatodes jerdonii characterized by the absence of any tubercles on the tail is represented by the type-specimen in our collection ; it is hopelessly broken into bits and is no longer capable of being handled. Of the other two species, *G. gracilis* and *G. kandianus*, there are several specimens. *G. kandianus* is distinguished by Boulenger[1] in his key by the presence of keeled scales on the under surface in the neck region, but in the specimens that I have examined this character varies considerably. In some the keeled scales extend over a considerable portion of the belly, while in others they are totally absent. In distinguishing these two species I have mainly relied on the character of the chin shields. *G. kandianus* possesses a relatively longer and more pointed snout and



TEXT FIG. 3.—Chin shields of *Gonatodes gracilis* and *G. kandianus*.
a. G. gracilis ×7½ ; *b. G. kandianus* ×7½.

3 chin shields behind the mental instead of two large ones as in *G. gracilis*. In *G. jerdonii* there is " a pair of small triangular chin plates " just separated by a large " lower rostral."[2]

G. gracilis.

15079-80	Sevagherry Hills	Brit. Mus. Exchange.
19636	Between Nierolay and Mettupalaiyam, base of Nilgiris . .	N. Annandale.
19633-5	Nierolay, base of Nilgiris	Do.
19676-8	Terkumalai, Courtallum	H. S. Rao.

[1] Boulenger, *Fauna Brit. Ind. Reptiles*, p. 74 (1890).
[2] Theobald, *Cat. Rept. As. Soc. Mus.*, p. 31 (1868).

G. kandianus.

15114	Ceylon	Basil Museum.
5971	Kandy, Ceylon	H. Ferguson.
16708-09	Peradeniya, Ceylon	F. H. Gravely.
17114	Nr. Umbari	Do.
17864-67	Trichur, Cochin State	Do.
16599	Marikuppam, S. India	Museum Collector.
16600-01	Bangalore, S. India	N. Annandale.
16143	Tenmalai, S. India	Do.

Genus **Hemidactylus** Gray.

(Plate VII, fig. 8.)

As is to be expected a major portion of our unnamed collection of geckos belonged to this genus. Representatives of as many as six species, *viz.*, *Hemidactylus brookii*, *H. bowringii*, *H. flaviviridis*, *H. frenatus*, *H. garnoti* and *H. platyurus*, have been found in it. All of these are fairly common and widely distributed species and there is very little to be said about them except that in a specimen of *H. brookii* from Digboi in the Lakhimpur District of Assam the tail is very abnormal and that *H. frenatus* has been found as far north as Kierpur in the Purneah District of Bihar. I also refer here to the presence of a single, dessicated specimen of *H. frenatus* from Maradu Island, Addu Atoll (Maldives).

In a normal specimen of *Hemidactylus brookii* the tail is " rounded, tapering, depressed ; above with small smooth scales and 6 or 8 longitudinal series of large, pointed, strongly keeled tubercles ; below with a median series of transversely dilated plates." In the abnormal specimen from Assam the tail slightly behind its origin is regenerated into a triradiate structure with two rounded, short arms on the sides and a similar but slightly longer structure in the middle. There are no tubercles on the upper surface and the scales, though slightly enlarged on the under surface, do not form definite plates.