

HERPETOLOGICAL NOTES X—XII

by

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X. NOTES ON THE NEWLY DESCRIBED GENUS CACOPHRYNE DAVIS

Recently Davis (1935) pointed out that the toad known in literature as *Bufo borbonicus* (Tschudi) or *Nectophryne borbonica* (Tschudi) does not belong to either of these genera, and that it even does not belong to the Bufonidae, for the species differs from the true toads (Bufonidae) in two important characteristics, as it lacks Bidder's organs and does not possess testes of an elongated shape. Moreover the pectoral girdle proved to be firmisternal instead of arciferal. A new genus, *Cacophryne*, in the family Atelopodidae, was erected for this species by Davis, and this author (1935, p. 90) mentions that possibly some other species at present included in the genus *Bufo*, i.e., *Bufo penangensis* (Stol.), *Bufo cruentatus* (Tschudi) and *Bufo leptopus* Gthr. might also belong to the genus *Cacophryne*. To ascertain whether this was really the case I examined some specimens of *Bufo cruentatus* (Tschudi) and two specimens of *Bufo leptopus* Gthr. Of *Cacophryne borbonica* (Tschudi) I examined some specimens for comparison.

As I had but two specimens of *Bufo leptopus* Gthr. I only examined the pectoral girdle of one, and this proved to be decidedly arciferal as in the true *Bufo*'s. Of *Bufo cruentatus* (Tschudi) and *Cacophryne borbonica* (Tschudi) I examined especially the osteological characters, and these led me to conclude that both species are congeneric, and that, therefore, *cruentatus* must also be referred to the genus *Cacophryne* Davis.

The following notes may be given on the anatomy of *Cacophryne borbonica* and *Cacophryne cruentata*. The vertebral column consists of eight procoelous presacral vertebrae, none of which have fused. The sacral

vertebra is also procoelous, it has widely expanded sacral diapophyses, and bears two condyles for the articulation with the coccyx. In this point my observations differ from those made by Davis (1935, p. 88), who states that the coccyx and the sacrum have fused. It may be that this character is subject to variation, for Noble (1922, pl. III; 1931, fig. 89) has shown that the ninth (or sacral) vertebra may fuse with the coccyx in abnormal specimens of *Atelopus varius* Stann. The pectoral girdle has been described and figured by Davis (1935, p. 88, fig. 8) as completely firmisternal, but in the specimens dissected by me I found, however, that the epicoracoids have not fused completely. They are free from each other posteriorly, the right one slightly overlapping the left. Though this perhaps is not easily seen when the pectoral girdle is examined from the ventral (external) side, it may be distinctly seen when the girdle is viewed dorsally (internal view). Definite proof, however, is given when the sternum is removed and the posterior (distal) borders of the epicoracoids are examined; then the border of the right epicoracoid is seen to lie ventrally of that of the left cartilage. This is therefore one of the many cases in which the pectoral girdle shows a condition intermediate between the arciferal and the firmisternal type, a condition which is not uncommon among the Atelopodidae, and which may point to the arciferal origin of the genus. A matter of less importance is, that I find the cartilaginous sternal plate to have a rounded outline posteriorly, and that it is not bilobate as that of the specimen figured by Davis (1935, fig. 8).

The thighmuscles show the bufonid type of arrangement as is characteristic for the suborder Procoela. The semitendinosus is separate from the sartorius; its tendon joins that of the sartorius, and passes ventral to the tendon of the gracilis major and minor.

Tadpoles which in all probability belong to *Cacophryne cruentata* (Tschudi)¹⁾ were described and figured by Miss. K. Schijfsma (1932, p. 44, figs. 1, 2: *Bufo cruentatus*). It is interesting to note that these tadpoles are different from the common bufonid type, as 1. "the lower lip is entirely bordered by papillae (not only at the sides)" (which is, however, also the case in *Bufo asper* Gravenh.), and 2. when "starting from the middle the spiral of the intestine is sinistral whereas in other bufonid tadpoles it is generally dextral".

1) The only other species that needed be taken into consideration was "*Nectophryne borbonica*"; as both species are now placed in the same genus *Cacophryne*, any doubt that might exist as to which of the species the larvae described by Miss Schijfsma do belong is of little importance as far as the present note is concerned.

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XI. NOTE ON AMPHISBAENA LIBERIENSIS (BLGR.)

(figs. 1—6)

Amphisbaena liberiensis was described by Boulenger (1878, p. 300, figs. 1—3) as the type species of a new genus: *Ophioproctes*; it was founded on a single specimen from Liberia, now in the Natural History Museum in Brussels. Strauch (1882, p. 390) referred the species to the genus *Amphisbaena* and herein he was followed by Boulenger (1885, p. 449). Strauch did not examine any specimens himself, but besides the description and the figures published by Boulenger, he had for examination three pendrawings of the head and one of the anal region made by Hubrecht from a specimen in the Leiden Museum. This specimen was collected by Büttikofer and Sala in Liberia in 1880; a year later two other specimens were taken by the same collectors and these are also preserved in our museum. As to my knowledge no notes on the variation of this species have been published, except those by Strauch I shall describe here the differences which I found to exist between the three specimens from the Büttikofer collection and the type. The data concerning the type are chiefly taken from Boulenger's description, but during a short stay at Brussels in 1929 I examined the type and made a few notes.

The following data are available as to the localities from which the specimens came:

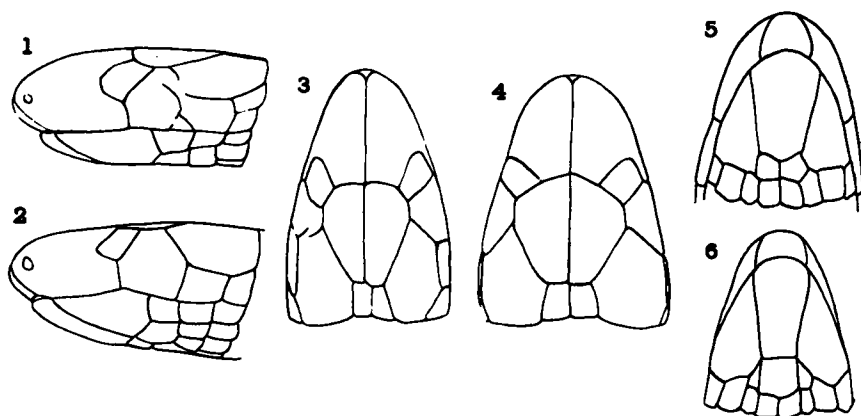
- 1 ex., type, Liberia, Musée Royal d'Histoire Naturelle, Brussels.
- 1 ex., Soforeh-Place, right bank of the St. Pauls-river, 50 miles inland, Liberia, captured in a hollow tree on a farm, August 1880, leg. Büttikofer and Sala, collector's number 47, Mus. Leiden, reg. no. 6458.
- 2 ex., Robertsport, Grand Cape Mount, Liberia, leg. Büttikofer and Sala, 17. VIII. 1881, collector's number 468, and 18. VIII. 1881, collector's number 473, Mus. Leiden, reg. no. 6459.

The variation of the number of annuli on body and tail, the number of segments in an annulus, and of the total length are best shown in the following table:

	type	Soforeh	Robertsport	
number of body-rings	219 ¹⁾	233	234	236
number of tail-rings	25 ¹⁾	27	26	24
number of segments	24	24	22	22
total length, in mm	153 ²⁾	145	142	143

The incisure which goes forward from the ocular into the large shields that cover the sides of the snout, and which is present on both sides in the type, is absent in the three other specimens. In the latter specimens the ocular seems to be somewhat larger than in the type. The width of the frontal in relation to its length varies slightly in the three specimens from the Büttikofer collection (type not examined in this respect):

	Soforeh	Robertsport	
length of frontal			
ratio $\frac{\text{length of frontal}}{\text{width of frontal}}$	2.4	2.3	2.0
width of frontal			



Figs. 1—6. *Amphisbaena liberiensis* (Blgr.); fig. 1, side view of head, Soforeh-Place, reg. no. 6458; fig. 2, id., Robertsport, reg. no. 6459 (collector's no. 468); fig. 3, upper view of head, Soforeh-Place, reg. no. 6458; fig. 4, id., Robertsport, reg. no. 6459 (collector's no. 473); fig. 5, lower view of head, Robertsport, reg. no. 6459 (collector's no. 473); fig. 6, id., Soforeh-Place, reg. no. 6458.

All figures $\times 7\frac{1}{2}$ approx.

The large temporal is bordered below by two shields in the type and the two specimens from Robertsport; in the specimen from Soforeh the posterior

¹⁾ Taken from the type; Boulenger (1878) wrote that the number of bodyrings was about 200, that of the tail-rings 28.

²⁾ After Boulenger.

of these two shields is horizontally subdivided into small shields. Strauch's remarks (1882, p. 391) which were based on the Soforeh specimen: "...dass unter dem einzigen Temporale nicht 2, sondern nur ein einziges Schild liegt, welches dabei an Grösse den beiden entsprechenden Schildern des Brüsseler Exemplars gleichkommt" are not clear to me in this respect. Perhaps a mistake was made in the drawings sent to Strauch. The shields on the left side of the head of the Soforeh specimen are abnormal. The suture that borders the upper labial posteriorly is incomplete, the lower part bends forward and thus the upper part of this shield is connected with the upper temporal and with the anterior lower temporal, as also the suture between the latter shields is incomplete (figs. 1, 3). A small additional triangular labial is incompletely separated from the large upper labial. The symphysial is bordered behind by one large shield with a smaller subtrapezoid shield on each side in the specimen from Soforeh, by four subtrapezoid shields of about equal size in the first of the Robertsport specimens, and by two polygonal shields in the other. The ventral segments are from $2\frac{1}{2}$ to 3 times as broad as long.

Synonymy:

Ophioproctes liberiensis Boulenger, Bull. Soc. Zool. France, vol. 3, 1878, pp. 300—303, 3 figs.

Amphisbaena liberiensis, Strauch, Mém. biol., vol. 11, 1881, p. 369, and pp. 390—391; Boulenger, Cat. Liz. Brit. Mus., vol. 2, 1885, p. 449; Büttikofer, Reisebilder aus Liberia, vol. 2, 1890, pp. 442—443 (living specimens flesh-coloured; in decaying wood), p. 478; Barbour and Loveridge, Rept. Amph. Liberia, 1930, p. 784.

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XII. NOTE ON *ARTHROSAURA RETICULATA* (O'SHAUGHN.) AND *ARTHROSAURA VERSTEEGII* LIDTH

In a previous paper (Brongersma, 1932) I discussed the differences existing between *Arthrosaura reticulata* (O'Shaughn.) and *Arthrosaura*

versteegii Lidth, arriving at the conclusion that the latter might prove to be a subspecies of the former. *Arthrosaura reticulata* was then known to me only from the descriptions published by O'Shaughnessy (1881, p. 230, pl. 22 fig. 1) and by Boulenger (1885, p. 389). Since that time I have examined the type of this species in the British Museum (Natural History), and compared it to the type of *Arthrosaura versteegii*. The direct comparison of these two types showed that they resemble each other very much, and I believe the small differences existing between them to be of subspecific value only. Before discussing these differences the type of *Arthrosaura reticulata* may be redescribed.

Arthrosaura reticulata reticulata (O'Shaughn.)

Cercosaura (Pantodactylus) reticulata O'Shaughnessy, Proc. Zool. Soc. Lond., 1881, p. 230, pl. 22 fig. 1.

Arthrosaura reticulata, Boulenger, Cat. Liz. Brit. Mus., vol. 2, 1885, p. 389; Burt & Burt, Bull. Am. Mus. Nat. Hist., vol. 61, 1931, pp. 312, 313, 347; Brongersma, Zool. Med. Mus. Leiden, vol. 15, 1932, pp. 78, 81; Burt & Burt, Trans. Ac. Sc. St. Louis, vol. 28, 1933, no. 1, p. 55.

Leposoma reticulatum, Cope, Proc. Am. Philos. Soc., vol. 23, 1885, p. 98.

Specimen examined:

1 ex., ♀, type, Canelos, Ecuador, leg. Buckley, Brit. Mus., reg. no. 80. 12. 8. 4.

Head less than twice as long as broad; snout slightly longer than the diameter of the eye. Rostral visible from above; frontonasal broader than long; prefrontals forming a suture. Frontal $1\frac{2}{3}$ times as long as broad, in contact with first and second supraoculars, narrowly separated from third supraocular. Three supraoculars, first smallest, second and third about equal. Frontoparietals five- to six-sided, shorter than the interparietal. Interparietal completely separating the parietals and much narrower than these, its anterior point wedged in between the frontoparietals, its posterior border faintly angulate. Seven supraciliaries, the first largest, the fifth long and narrow. All pileus-shields smooth. Lower eyelid with a transparent disk, which is composed of three parts. Nostril in a single nasal, which is bordered behind by a loreal and a freno-orbital, the former in contact with the first supraocular. A row of suboculars. Seven upper and seven lower labials; the fourth upper labial clearly separated from the orbit. Behind the symphysial one large unpaired chinshield followed by two pairs of chinshields, which form a median suture. The chinshields of the third pair are separated from each other by one small shield anteriorly and by two small shields posteriorly. These two small shields are for the greater part enclosed by the fourth pair of chinshields. Besides by these two small shields the chinshields of the fourth pair are separated posteriorly by five

shields, which are placed as follows: a rather large one on each side (bordering the chinshields) and three smaller ones arranged in a triangle between them. The fourth chinshield of each side is bordered on its outer side by two shields, the anterior of which is largest. Behind the chinshields some small granules, followed by two rows of small scales. Four pairs of large gulars. The collar consists of nine shields, the outer of which are very small. Back covered with transverse series of narrow, hexagonal, lanceolate scales, which are strongly keeled. On the sides the scales are of about the same size as on the back, the outer rows are not keeled and end rather abruptly next to the ventrals. 29 transverse rows of scales between the occiput and the base of the tail; 39 scales round the body (including the ventrals). The scales on the sides of the neck, of the axilla and groin are small and granular. Some granules are also present between the transverse rows of scales on the sides of the body. Ventrals in 10 longitudinal rows, subquadrangular, rounded posteriorly, imbricate, all smooth. They form regular longitudinal and transverse rows; 18 transverse rows from collar to preanal plates. Six preanal plates, the medio-anterior and the medio-posterior forming a suture. A pair of lateral shields on each side, the inner one of which is large, the outer very small. No preanal or femoral pores. Forelimb above with large scales, below with granular scales. Hindlimb anteriorly with large scales, posteriorly with granules. The hindlimb does not reach the axilla when pressed against the body. Scales on the lower side of the tail convex, but not keeled.

Colour: Head shields with darkbrown centres and light edges, on occiput large light spots arranged more or less symmetrically; one series of light dark edged spots along the middle of the back; one series at the sides of the body. Anterior part of back with a blackish reticulation, which becomes indistinct posteriorly; posterior part of back with dark cross-lines as in *Arthrosaura versteegii*. Lower side light brownish with dark spots on the chinshields; labials with dark bars. Belly and underside of tail uniform yellowish-brownish. Tail above brownish with traces of a series of light spots.

Measurements in mm

Length of head and body	45	Height of head	3½
Length of tail	78	Distance from snout to forelimb	17
Length of head	10¼	Distance from axilla to groin	22½
Width of head	6¼		

For a complete description of *Arthrosaura versteegii* Lidth I may refer to my previous paper (Brongersma, 1932, p. 81, figs. 1, 3, 5, 9, 11).

Besides some small differences in the number of dorsal scale rows and of ventral plates, in the number of collarshields and that of gular plates, some other differences which seem to be of more importance were found by me when comparing the types. In *A. reticulata* the earopening is smaller than in *versteegii*, its diameter in the former being not yet $\frac{1}{2}$ time the diameter of the orbit, while in the latter it is $\frac{2}{3}$ times the diameter of the orbit. *A. versteegii* has 4 supraciliaries while in *A. reticulata* 7 supraciliaries are present. In *A. versteegii* 3 pairs of chinshields are in contact, in *A. reticulata* only two pairs. In this respect the latter resembles *A. kockii*. As already mentioned in my previous paper (1932, p. 78) there is a marked difference in the number of preanal plates. Judging by the descriptions of these two forms one would suppose that very important differences exist in their coloration, but by comparing the types I became convinced that the differences were more of a quantitative than of a qualitative nature. The type of *A. reticulata* is more vividly marked; the centres of the headshields are darkbrown, and the dark reticulation is very strongly marked on the anterior part of the back, but on the posterior part of the back only dark crosslines are present as in *A. versteegii*. In *A. reticulata* the chinshields bear dark spots, while these are absent in *A. versteegii*, but in both the lower labials bear dark bars.

Unhappily of each of these forms only one specimen is known, and therefore we do not know what the individual variation of these characters is. It seems very probable to me that the differences mentioned above are only of subspecific importance, and that *A. versteegii* represents only a subspecies of *A. reticulata*.

Thus the genus *Arthrosaura* would comprise two species: *A. reticulata* (which may be divided into two subspecies, *A. reticulata reticulata* (O'Shaughn.) and *A. reticulata versteegii* Lidth) and *A. kockii* (Lidth). These two species may be distinguished by the characters given in the key in my earlier paper (1932, p. 81). I cannot agree with Burt & Burt (1933, p. 55) who include two other species, *A. concolor* (Tschudi) and *A. tatei* Burt & Burt, in this genus. As mentioned already (1932, p. 80) the status of *Pantodactylus concolor* Tschudi (1847, pp. 48, 50) remains doubtful as the type is lost; judging by the description given by Tschudi it resembles *Pantodactylus schreibersii* (Wiegman) in several characters, and if not identical with that species it will have to be referred almost certainly to the same genus. *Arthrosaura tatei* Burt & Burt differs so much from the other members of the genus, that I am convinced that it must belong to a separate genus.

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