ON THE PRESENCE OR ABSENCE OF HYPAPOPHYSES UNDER THE POSTERIOR PRECAUDAL VERTEBRAE IN SOME SNAKES

by

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With 1 figure

In his "Catalogue of Snakes" Boulenger (1893—1896) followed Cope in considering the presence or absence of well developed hypapophyses under the posterior precaudal vertebrae as a character of great systematic importance. Thus Boulenger divided the genera of both the Colubrinae and Dipsadomorphinae (= Boiginae) into two groups; one of these groups is characterized by the presence of well developed hypapophyses under the posterior precaudal vertebrae, while in the genera of the other group these hypapophyses are lacking. Rosén (1905a) showed that this character was not so important as previous authors had believed it to be, for he found well developed hypapophyses [1]) in *Chrysopelea ornata* (Shaw) and *Anisodon lilljeborgi* Rosén (= *Psammodynastes pulverulentus* (Boie)), in which species they are lacking according to Boulenger. In *Helicops leopardina* (Schl.) and *H. modesta* (Gthr.) Rosén (1905a, p. 170, figs. 1a, 1b) did not find these hypapophyses, although Boulenger placed the genus *Helicops* Wagl. in the group possessing them. Boulenger (1905) criticized Rosén's paper, and stated that he did not find more than a low keel under the posterior precaudal vertebrae in all specimens of *Chrysopelea ornata* (Shaw) examined by him. To this criticism Rosén (1905b) replied that among the specimens of *Chrysopelea ornata* (Shaw), which he examined in this respect, well developed hypapophyses were present in some specimens, while they were lacking in others. Moreover he mentions the presence of hypapophyses in *Psammodynastes pulverulentus* (Boie).

Not much attention has been paid to Rosén's researches, and so Meise

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1) In all cases where hypapophyses are mentioned in this paper, this refers to the hypapophyses under the posterior precaudal vertebrae.

& Hennig (1935, p. 140) again mention the absence of hypapophyses in *Chrysopelea* Boie. It seemed to me worth while to check this character in the species mentioned by Rosén, as well as in some other species. To this purpose I (Brongersma, 1938) examined 43 specimens of *Chrysopelea ornata* (Shaw) from different localities in the Indo-Australian Archipelago, the Philippines and Siam. In 37 of these specimens well developed hypapophyses were present; in 5 specimens (Siam, 2; Philippines, 2; Java, 1) only a low keel was found, while in only 1 specimen (Java) hypapophyses were completely absent. The presence of well developed hypapophyses is, therefore, a common occurrence in *Chrysopelea ornata* (Shaw), and Rosén's statement as to the variability of this character is confirmed. For comparison I examined 16 specimens of *Chrysopelea rhodopleuron* Boie and 3 specimens of *Chrysopelea pelias* (L.); in all of these the hypapophyses were lacking.

Recently Meise & Hennig (1935) have shown that *Chrysopelea* Boie and *Dendrophis* auct. (= *Dendrelaphis* Blgr.) can hardly be separated. This led me to examine 28 specimens of *Dendrelaphis pictus* (Gmel.) and 7 of *Dendrelaphis caudolineatus* (Gray) from the Indo-Australian Archipelago; in none of these specimens did I find hypapophyses. Neither did I find these in one specimen of *Dryophiops rubescens* (Gray), a species which Meise & Hennig (1935, p. 139) place with *Chrysopelea* Boie.

Of *Psammodynastes pulverulentus* (Boie), a species also studied by Rosén (1905a, p. 176: *Anisodon lilljeborgi;* 1905b, p. 128), 12 specimens were examined, as well as 6 specimens of the related *Psammodynastes pictus* Gthr.; well developed hypapophyses were present in all of these.

Rosén (1905a, p. 171, fig. 1c) mentions the absence of hypapophyses in *Tretanorhinus intermedius* Rosén. Boulenger (1893, p. 281) mentioned the presence of hypapophyses as one of the characters of the genus *Tretanorhinus* Dum., Bibr. & Dum. I failed to find them, however, in the only specimen of *Tretanorhinus variabilis* Dum., Bibr. & Dum. available to me. No more than Rosén (1905a, p. 170, fig. 1a) did I find hypapophyses in *Helicops leopardina* (Schl.), of which I examined one of the cotypes. In *Helicops bicolor* (Gthr.) (1) [1]), *Helicops schistosa* (Daud.) (2), and *Helicops angulata* (L.) (1), however, well developed hypapophyses were present.

Besides these species I examined *Langaha crista-galli* Dum., Bibr. & Dum. (1), which possesses hypapophyses, and *Ahaetulla prasina* (Boie) (6), *Oxybelis fulgidus* (Daud.) (2), *Boiga cynodon* (Boie) (3), *B. jaspidea*

1) Between brackets the number of specimens which I examined is indicated.

(Dum., Bibr. & Dum.) (2) and *B. multimaculata* (Boie) (2) in which hypapophyses are absent. In respect to the presence or absence of hypapophyses these species, therefore, show the characters attributed to them by Boulenger. In *Boiga irregularis* (Merr.), however, the character is variable. Five specimens out of the seven examined possess a high keel under the posterior precaudal vertebrae; this keel projects distinctly below the condyle, and may be termed a moderately developed hypapophysis (fig. 1). In one specimen the keel was very low, and in another hypapophyses were absent altogether.

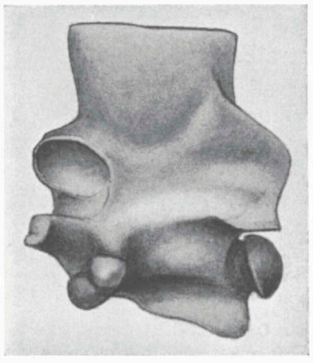

Fig. 1. *Boiga irregularis* (Merr.), Halmaheira, Mus. Leiden, reg. no. 495, precaudal vertebra, side view. × 6.

In five species, *Chrysopelea ornata* (Shaw), *Psammodynastes pulverulentus* (Boie), *P. pictus* Gthr., *Boiga irregularis* (Merr.) and *Helicops leopardina* (Schl.), differences from Boulenger's descriptions were found. In two species, *Chrysopelea ornata* (Shaw) and *Boiga irregularis* (Merr.), the character proved to be variable, which had been recorded for the former and *Psammodynastes pulverulentus* (Boie) by Rosén.

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