

XVII.—On the Species of the Genus *Viverricula*.

By J. L. BONHOTE.

SEVERAL species of this genus have been made at various times, but latterly most authors have placed them together as one. A careful comparison, however, of the skins and skulls in the British Museum has led me to the following conclusions:—So far as can be judged from the present series, the markings seem to vary considerably in colour, from a rufous to a dark brown in individuals from the same locality; there seem, however, to be three distinct species in the group, each of which might be subdivided into two or more subspecies.

The species are as follows:—

V. malaccensis (Gmel.).—Inhabiting India from Rajputana to the Malay Peninsula.

V. rasse (Horsf.).—Now found (whether introduced or not) in Java, Ceylon, Socotra, Madagascar, and Comoro Islands.

V. pallida (Gr.).—From China and Formosa.

Viverricula malaccensis (Gmel.).

Viverra malaccensis, Gmel. Linn. Syst. Nat. i. p. 92 (1788); Jerdon, Mamm. Ind. p. 122 (1867).

Viverra indica, Desm. N. Dict. d'H. N. (2) vii. p. 170 (1817); Horsf. P. Z. S. 1832, p. 23; Elliot, Madr. Journ. x. p. 102 (1839).

Viverra bengalensis, Gray & Hardw. Ill. Ind. Zool. i. pl. iv. (1830–32).

Viverra rasse, Elliot, Madr. Journ. x. p. 102 (1839).

Viverricula indica, Hodgs. Ann. & Mag. Nat. Hist. (1) i. p. 152 (1838); id. J. A. S. B. x. p. 909 (1841).

Viverricula rasse, Hodgs. Ann. & Mag. Nat. Hist. (1) i. p. 152 (1838) (probably misprint for *rasse*).

Viverricula rasse, Hodgs. J. A. S. B. x. p. 909 (1841).

Viverricula malaccensis, Blyth, Cat. Mamm. Mus. As. Soc. p. 45 (1863); Anderson, Zool. Yunn. Exp. p. 166 (1879); Blanford, Mamm. Brit. Ind. p. 100 (1888).

This species is so variable in colour and form of markings that I have been unable to find any constant external characters by which it may be easily recognized; the skulls, however, show considerable uniformity, and the auditory bullæ, which are long and compressed laterally, causing them to be deep at the same time, form a character by which the present species may be recognized at any age. The bullæ converge anteriorly, so that there is a considerable narrowing of the anterior end of the basioccipital, and in correlation with this its edges are turned downwards, so as to form a prominent ridge in front of the bulla on either side.

Average measurement of ten adult skulls :—

Basal length 93.8 millim.; zygomatic breadth 44.4; length of palate from henselion 45.7; length of bulla 23; basioccipital, breadth at condyloid foramina 12.7, breadth anteriorly 6.8; greatest diameter of upper carnassial 9.4; least breadth of palate between inner roots of carnassials 12.3.

Specimens from the Malay Peninsula representing the original *V. malaccensis* may be distinguished by having only seven dark rings on the tail instead of eight as in all other specimens, the tip being pure white.

While there are no very tangible differences among specimens from different parts of India proper, there are in the British Museum two specimens from Rajputana so different in appearance that I would make them a subspecies, and propose for them the name

Viverricula malaccensis deserti, subsp. n.

Viverricula malaccensis, Thos. P. Z. S. 1886, p. 55.

Similar in size to *V. malaccensis*. Hair close and long. General colour buffy white, with darker mottlings, but with no distinct markings except a few spots on the flanks. The winter pelage consists of a thick woolly underfur, slate-grey at its base and whitish towards the tip, thickly interspersed with long white bristles having a dark or fulvous tip. The summer coat is similar, except that the underfur is scanty and the bristles greatly predominate. The underside of the neck is of a uniform buffy white, interrupted by two transverse dark bands. The chest and belly are similar to the back, except that the bristles are more scanty and have no dark tip, thus allowing the slate-grey of the underfur to show through. Hands and feet uniform seal-brown. Tail covered with long hair similar to that on the body and marked with alternate rings of dark brown and whitish.

The skull presents no marked differences from that of a typical *malaccensis*.

Dimensions of the type (an adult male measured in the flesh) :—

Head and body 581 millim.; tail without hair 401; ear 30; hind foot 99.

Skull: basal length 94; zygomatic breadth 45; length of palate from henselion 45.7; length of bulla 22; basioccipital, breadth at condyloid foramen 13, breadth anteriorly 6.5; greatest diameter of upper carnassial 10; least breadth of palate between inner roots of carnassials 12.3.

Hab. Rajputana.

Type B. M. 85. 8. 1. 27. Sambhar, Rajputana. Collected by Mr. R. M. Adam, 17th December, 1877, and presented by Mr. A. O. Hume.

A second specimen, obtained at Nusserabad, in the same province, in August 1878, has been recently presented to the Museum by Col. J. W. Yerbury, and agrees in all respects with the type.

This subspecies, which differs in habits from the true *malaccensis* by frequenting desert country instead of forests, may be easily distinguished by its very light colour and the absence of any distinct stripes on the back.

Viverricula rasse (Horsf.).

Viverra rasse, Horsf. Res. Java, pl. xviii. (1824); id. P. Z. S. 1832, p. 23; Peters, Reise nach Mossambique, Mamm. p. 113 (1852).

Viverricula Schlegeli, Pollen, Ned. Tijds. Dierk. iii. p. 78 (1866).

This species does not differ externally from *V. malaccensis*, except in its smaller size, and, although as a whole it varies as much as the preceding one, yet individuals from the same locality appear to be fairly constant in colour and markings.

Horsfield's statement that *V. rasse* has eight broad longitudinal lines on the back, the three lateral lines on each side interrupted and obscure, while *V. malaccensis* has eight narrow longitudinal lines, the lateral lines continued, does not appear to hold good for all individuals.

The skull, however, shows marked differences from that of *V. malaccensis*, the auditory bullæ being much shorter, flatter, and not converging so much towards the middle line, thus causing the basioccipital to be considerably broader at its anterior end and not folded into ridges when it leaves the bulla.

Dimensions of the skull of one of Horsfield's typical specimens (B. M. 74):—

Basal length 86 millim.; zygomatic breadth 42; length of palate from henselion 43; length of bulla 20; basioccipital, breadth at condyloid foramen 11.5, breadth anteriorly 8; greatest diameter of upper carnassial 9; least breadth of palate between inner roots of carnassials 12.

Specimens from the various islands appear to differ slightly from each other, but the material at hand does not seem to me sufficient to justify at present the subdivision of the species.

Viverricula pallida (Gr.).

Viverra pallida, Gray & Hardw. Ill. Ind. Zool. ii. pl. vi. (1833-34);

Swinhoe, P. Z. S. 1862, p. 353; Gray, P. Z. S. 1864, p. 514.

Viverricula malaccensis, Swinhoe, P. Z. S. 1870, pp. 227, 630.

This species is considerably larger than *V. rasse*. The markings are not usually very distinct and the general colour is suffused with fulvous. It may be distinguished from both the preceding species by the absence of the transverse markings on the underside of the neck.

The skull differs only from that of *V. rasse* by its greater size.

Dimensions of a skull from Formosa (a small specimen):—

Basal length 87 millim.; zygomatic breadth 45; length of palate from henselion 43; length of bulla 20; basioccipital, breadth at condyloid foramen 12·7, breadth anteriorly 9; greatest diameter of upper carnassial 10; least breadth of palate between inner roots of carnassials 13.

These dimensions are far exceeded in the other skulls, but these are given as it is the only skull sufficiently perfect to allow all the measurements to be taken on it. The largest skull has a zygomatic breadth of 49 millim. and greatest diameter of upper carnassial 10·5 millim.

This species varies less than the others; the markings are almost always indistinct and generally absent on the fore part of the body. Swinhoe thought Formosan examples slightly different, but the specimens in the British Museum do not bear out that conclusion.

Key to Species of Viverricula.

- A. Basioccipital converging anteriorly, bullæ long.
 - a. Markings distinct *V. malaccensis*.
 - b. Markings indistinct..... *V. m. deserti*.
- B. Basioccipital scarcely converging anteriorly, bullæ short.
 - a. Dark transverse band on throat *V. rasse*.
 - b. No dark transverse band on throat *V. pallida*.

XVIII.—*A List of Reptiles and Batrachians from Ombaai, East Indian Archipelago.* By G. A. BOULENGER, F.R.S.

IN a previous number of these 'Annals' * I contributed a list of the Reptiles and Batrachians collected by Mr. Alfred Everett in Lombok, Flores, Sumba, and Savu. Thanks to the exertions of the same traveller I am now able to supplement our knowledge of the herpetology of that chain of islands by giving a list of the Reptiles and Batrachians obtained by him on Ombaai. All belong to known species.

LIZARDS.

1. *Hemidactylus frenatus*, D. & B.

* Ser. 6, vol. xix. 1897, pp. 503-509.



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