

A New Water-Monitor from Northern Australia

By ERIC WORRELL

(Plates xxvii-xxix.)

In 1944 I collected a number of these large water-monitors at Edith Falls on the upper reaches of the Edith River, Northern Territory, and subsequently a few at the head of the Katherine River, Waterhouse River and Roper River near Mataranka, Northern Territory. Mr. Melbourne Ward of Medlow Bath obtained a large specimen from me collected on the Waterhouse River, and in 1955 I was able to collect two more from Bulliwallah Station, on the Belyando River in Queensland.

This *Varanus* is not particularly common but occurs in isolated colonies in inland areas of the Northern Territory and North Queensland. It is shy, difficult to collect alive, but fairly hardy in captivity.

It is proposed to describe this lizard as a new species after the locality (Bulliwallah Station) in which some of the material was obtained. The type was collected from a waterhole near the Belyando.

ACKNOWLEDGMENTS

Gratitude is expressed to Mr. F. King of Bulliwallah Station who kindly made facilities available and helped me collect material on his property, also to Messrs. L. Robichaux and J. Dwyer for assistance with the collection of specimens.

Varanus bulliwallah, sp. nov.

Form robust; snout broad, depressed on end, distance between anterior margin of orbit and tip of snout a little greater than distance between anterior margin of orbit and tympanum; moderate canthus rostralis; nostrils round, set on upper surface of snout on prominent ridges with longitudinal groove between, about one-third distance from tip of snout to orbit. Limbs stout, digits elongate; tail stout at base, strongly compressed laterally with a rapid taper, double keeled on the dorsal surface from about the first eighth, almost one and a quarter times longer than length of head and body. Tympanum round, exposed, about as large as orbit.

Head short, shields irregular, frontal and prefrontal scales largest, gradually diminishing to supraoculars, supratemporals and loreals; temporals small, granulated; labials and supratemporals somewhat hexagonal and regular; nuchals rounded and granular; dorsals more or less ovate, being entirely keeled; upper surface of limbs and tail with keeled scales. Scales on throat and under surface of limbs smooth, ovate; palmar scales small and tubercular; abdominals elongate, smooth, in about 126 transverse rows between gular fold and anus; subcaudals elongate, smooth, about 220, but tail incomplete.

Colour: Dark brown on dorsal surface with a small light spot on each scale, snout light brown, this colour extending along side of head to tympanum; ventral surface yellow with a regular series of dark transverse bands about four scale rows wide from gular fold to end of tail. There are a few darkish marks on labials. The iris is light greenish and tongue blue. Juveniles are conspicuously marked on dorsal surface with yellow spots.

Measurements: Total length of type 102 cm. or 40 inches. The tail is incomplete, its length being 55 cm. or 21 inches. The largest specimen we have in captivity at Ocean Beach Aquarium, Woy Woy, was collected at Bulliwallah Station and measures 120 cm. or 47 inches.

Discussion: *Varanus bulliwallah* cannot be easily confused with other monitor lizards as it is a conspicuously marked aquatic form. It occurs

inland away from the coastal and mangrove habitat of *indicus*(1) and *salvator*.(2) It is at once distinguished from *indicus* and *salvator* by its short head and position of nostrils on upper surface of snout. The nearest form appears to be *salvator*, it can be separated thus:

Transversely enlarged supraoculars; oval keeled nuchals . . . *salvator*.
Supraoculars irregular, subequal; nuchals irregular without keels . . . *bulliwallah*.

Natural food consists of frogs and fish, and in captivity it is induced only with difficulty to eat anything else.

The type-specimen, in spirits, has been donated to the Australian Museum.

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EXPLANATIONS OF PLATES XXVII—XXIX.

Varanus bulliwallah, sp. nov., in life.

Varanus bulliwallah. Dorsal aspect of head.

Varanus bulliwallah. Lateral aspect of head.

A New Snake from Queensland

By ERIC WORRELL

(Figs. 1-3.)

Several years ago, while examining a collection of snakes at Melbourne Ward's Gallery of Natural History and Aboriginal Art in the Blue Mountains I came across a small snake, superficially resembling "*Denisonia gouldi*," from Dulacca, Queensland. I observed a number of differences, however, which were subsequently borne out in a large series from Queensland collected by Mr. W. Dunmall in the Glenmorgan area. A series of skulls from Queensland was compared with a series of skulls from *Denisonia gouldi* (Gray 1841) from Western Australian localities, and many obvious differences were noted. It is proposed to describe the Queensland snakes as a new species which I have pleasure in naming after Mr. J. Dwyer of Cairns, who was instrumental in locating Mr. Dunmall's series and obtaining working specimens.

Loveridge mentions a specimen of "*gouldi*" given by Mrs. H. McKee of Dalby to a member of the Harvard Expedition. Loveridge comments that this specimen, being the first recorded from Queensland, "should be received with caution." Apparently this was the same as the species I propose to describe as new, as Dalby is in the same area as Glenmorgan, and the snake is a common species.

ACKNOWLEDGMENTS

Thanks are due to Mr. W. Dunmall, Mr. M. Ward, Mr. L. Robichaux and Mr. J. Dwyer for specimens, and Mr. H. Chalmers for his assistance and X-rays. Mr. J. Dwyer kindly drew the illustrations.

Denisonia dwyeri, sp. nov.

Maxillary almost as far forward as palatine; ectopterygoid longer than lower aspect of maxillary bone; a pair of straight fangs is followed by four small grooved recurved teeth beginning at posterior of maxillary arch.

The obvious differences between the skulls of *Denisonia gouldi* and *Denisonia dwyeri* are illustrated. The most outstanding feature, however, is the greater prolongation of *dwyeri*, the smaller frontal foramen, the differently shaped premaxilla, fronto-nasals, prefrontals and post-parietal area.

(1) *Tupinambis indicus*, Daudin, Rept. iii, 1802, p. 46, pl. XXX.

Varanus indicus, Boulenger, Cat. Liz. ii, 1885, p. 316 (s. syn.).

(2) *Stellio salvator* Laurenti, Syn. Rept., 1768, p. 56.

Varanus salvator Boulenger, Cat. Liz. ii, 1885, p. 314 (s. syn.).

In general form the head is larger and snout more depressed than in *gouldi* and the neck is a little more distinct. The snout is more pointed. There is no canthus rostralis. Eye about as large as its distance from mouth, pupil round. Body cylindrical to depressed, scales smooth in 15 rows, ventrals rounded.

Scalation: Rostral broader than deep, sharply angulate, in front, visible dorsally; nasal entire; internasals a little smaller than prefrontals; single prefrontal in contact with nasal; frontal posteriorly acute, almost $1\frac{1}{2}$ times as long as broad, longer than its distance to snout, about twice as broad and $1\frac{1}{2}$ times length of supraoculars; parietals large, temporals 2+2, anteriors larger; two postoculars; 6 supralabials, 3rd and 4th enter eye; 7 infralabials, 4th largest; two pairs of chinshields of similar size, both pairs in contact; 1st to 3rd or 4th infralabials in contact with anterior chin-shields; 4th, or 3rd and 4th infralabials in contact with posterior chin-shields.

The head-shields of paratypes agree with the type except that in the paratype lodged at Ocean Beach Aquarium a small pair of scales follows rostral, abnormally occupying part of interanasal area.

Glenmorgan type: 15 scale rows; ventrals 148; anal 1; subcaudals 31, entire.

Specimen donated to Australian Museum.

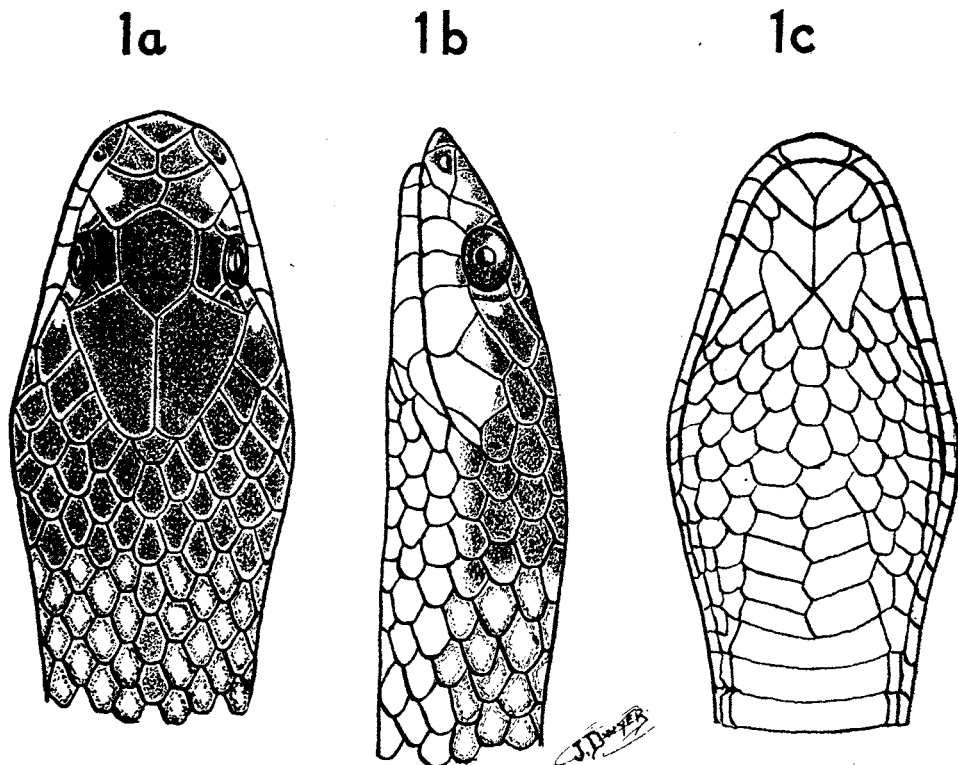


Fig. 1a. Dorsal aspect *Denisonia dwyeri*.

Fig. 1b. Lateral aspect *Denisonia dwyeri*.

Fig. 1c. Ventral aspect *Denisonia dwyeri*.

Glenmorgan paratype: 15 scale rows; ventrals 152; anal 1; subcaudals 25 entire. Specimen lodged in author's collection at Ocean Beach Aquarium, Woy Woy, N.S.W.

Dulacca paratype: 15 scale rows; ventrals 147; anal 1; subcaudals 27 entire. Specimen lodged at Melbourne Ward's Gallery of Natural History and Aboriginal Art, Medlow Bath, Blue Mountains, New South Wales.

Goorganga Ranges paratype: 15 scale rows; ventrals 152; anal 1; subcaudals 34 entire. Being the largest specimen from which a skull was taken, the body, collected damaged on the road, has been kept and is lodged at Ocean Beach Aquarium.

Colour: Juvenile to medium specimens black-headed with front of snout and sides of head whitish, body light brown with black reticulations around scales, the belly is white. In adult forms the body scales are dark brown to black.

Measurements: (Type) length 309 mm. or $12\frac{1}{4}$ inches. Tail 40 mm., head 13 mm. The Goorganga specimen measures 484 mm. or 19 inches with a body-diameter of about 13 mm. or $\frac{1}{2}$ inch.

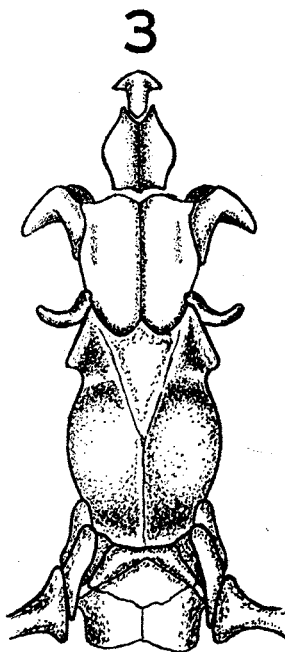
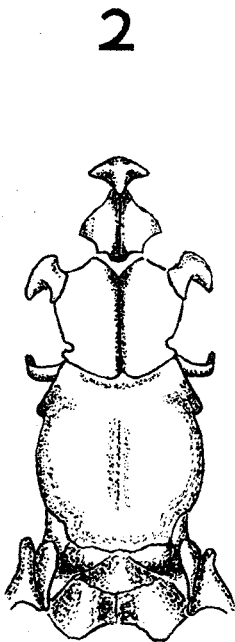


Fig. 2. Skull of *Denisonia gouldi*.

Fig. 3. Skull of *Denisonia dwyeri*.

Discussion.

These small snakes were all collected under flat stones, and a number I kept in captivity were nocturnal and fed on small skinks. While there are numerous osteological differences between *gouldi* and *dwyeri* the small size of most specimens of both snakes makes confusion likely on external characters alone. Adult specimens, when compared, are readily distinguishable.

The most consistent external features in which they differ to any marked degree are as follows:

Head large; rostral sharply angulate in front; frontal longer than its distance to snout *dwyeri*
 Head smaller; rostral obtusely angulate; frontal about as long as its distance to tip of snout *gouldi*

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Notes on Skull-characters of Some Australian Snakes

By ERIC WORRELL

(Plate XXX; Text-figures 3-8.)

In this paper obvious and consistent skull-characters are used to separate controversial species of snakes which are not readily separable by external features alone. Most systems based on scalation alone break down on a large enough series, especially when small snakes are concerned and infinitesimal dimensions must be considered. Colour on its own is unsatisfactory, although in this paper osteological differences are also supported by colour-differences. There are also ecological differences.

It is proposed to show that specific distinctions are present in the skulls of the following snakes: *Liasis fuscus*, *Liasis albertisii*, *Denisonia maculata*, *Denisonia devisii*, *Denisonia nigrescens*, *Denisonia pallidiceps*, *Denisonia coronoides*, *Denisonia mastersi*, *Denisonia nigrostriata*, *Denisonia gouldi*, *Demansia olivacea*, and *Demansia psammophis*.

In most part the illustrations are self-explanatory, so unnecessary measurements are not included in these notes. The characters are consistent in a series, and age-changes have been taken into consideration. The most variable age-changes take place in the parietal bone which in the juvenile stage is shorter and more bulbous at its proximation to the frontals which broaden slightly with age.

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Special thanks are due to Mr. J. Dwyer for his finely executed figures.

Subfamily PYTHONINAE.

Liasis fuscus Peters. Frontal bones as broad as deep; nasals small; postorbital laterally broadest at its suture with the maxillary; orbital periphery larger in diameter than in *L. albertisii*. Mandibular foramen reduced.

Dentition: Maxillaries about 21, slightly enlarged anteriorly with gradual degradation posteriorly; palatines 7, slightly enlarged anteriorly; pterygoids about 12, subequal; dentaries about 20, slightly enlarged anteriorly with

slight posterior degradation. All teeth in both jaws more or less uniformly recurved.

Liasis albertisi Peters & Doria. Frontals broader than deep; nasals large; postorbital laterally narrowest at its suture with the maxillary. Mandibular foramen enlarged.

Dentition: Maxillaries about 23, greatly enlarged anteriorly, with a rapid degradation posteriorly; palatines 6, greatly enlarged anteriorly with rapid degradation; pterygoids subequal, about 17; dentaries about 23, greatly enlarged anteriorly, a rapid degradation, then a slightly perceptible degradation of the posterior half. Only the anterior teeth of both jaws are recurved to any exaggerated extent.

Family ELAPIDAE.

Denisonia maculata (Steindachner). Colour blackish brown above with black-striped lips. Belly yellow, black spotted on outside edges. Specimens in this collection are from Rockhampton and districts west to Clermont and north to Bulliwallah Station, Queensland.

Frontal and nasal bones broader than deep; nasal and prefrontal in close proximation; pre- and postfrontal in closer proximation than in *devisii*; differences in the parietal and post-parietal area are illustrated.

Denisonia devisii Waite & Longman. Colour pale brown with multiple dark brown cross bars. Ventrals cream to yellow. Specimens examined from north of Cairns, western Queensland, inland northern New South Wales and western Murray River, New South Wales.

Frontal and nasal bones deeper than broad; nasal and prefrontal not in close proximation; prefrontal and postfrontal widely separated.

Denisonia nigrescens Gunther. Colour dark brown to black above, ventrals whitish to pink, sometimes blotched with black. Melanotic forms are not uncommon. Material examined from Cape York to Sydney area.

Frontal area as deep as broad; anterior border of prefrontal approximates nasal on lateral edge less than in *pallidiceps*; postfrontal sutured more forward on frontal on which foramen is prominent. Other differences are illustrated.

Denisonia pallidiceps Gunther. Colour rich brown with paler head and creamish abdominals. Specimens collected by author from Darwin, West Arm, Katherine and Mataranka, Northern Territory.

Frontals much deeper than broad; nasals prominently larger and frontals more angulate posteriorly than in *nigrescens*.

Denisonia olivacea (Gray). Colour dark brownish above, olivaceous belly. In Mackay district colour is melanotic. Grows to a greater size than *D.p. psammophis* and its allies and ranges with this species in eastern Queensland from parts of Atherton Tablelands to south of Rockhampton. In north-western Australia, Northern Territory and northern islands *D. olivacea* ranges with *D.p. ornaticeps*, and in some localities in north Queensland it occurs with *D.p. torquata*. The largest *D. olivacea* in this collection measures 210 cm., or 6 feet 3 inches.

The posterior lobe of the parietal shows the same differences in material ranging from late embryonic to aged specimens, likewise the relationship of the postfrontal to maxillary bone; the septo-maxilla is in closer proximity to the maxillary than in *psammophis*.

Demansia psammophis psammophis (Schlegel). Colour greyish to pale russet with a yellow mark bordering eye. Ventrals greenish. Eastern Australia from north to south.

Denisonia coronoides (Gunther). Coloured sombre olive brown, greenish or brick red with white upper lip and grey to salmon or yellowish ventrals. Specimens in this collection examined from eastern New South Wales, Tasmania, Flinders Island and Mt. Gambier, South Australia.

Maxillary anterior to palatine; prefrontals not dilated at their suture with frontals; pterygoids posteriorly dilated.

Denisonia mastersi (Krefft). Colour brownish with dark peppering above, ventrals yellowish. Head is dark with yellowish collar. This collar is conspicuous in late embryonic material and loses little brilliance with age. Material examined from Moruya, Blue Mountains, and surrounding districts, New South Wales.

Maxillary not anterior to palatine; septo-maxilla in closer proximity to maxillary than in *coronoides*; prefrontals dilated at their suture with the frontals; pterygoids not dilated posteriorly.

Denisonia nigrostriata (Krefft). Colour reddish with conspicuous black vertebral strip usually present. Ventrals creamish. Series from north-eastern Queensland.

Nasals enlarged; frontal foramen enlarged; prefrontal closely proximates nasal; prefrontals dilated at suture with frontals. Other differences are illustrated.

Denisonia gouldi Gray. Colour pale brown to blackish with black head, white lips and creamish belly. Series examined from type locality, south-west Western Australia.

Nasals small; prefrontal spaced further from nasals than in *nigrostriata*; prefrontals not dilated at suture with frontals; frontal foramen less conspicuous than in *nigrostriata*.

ILLUSTRATIONS

- Fig. 3a. *Liasis albertisii* (Dentition).
 Fig. 3b. *Liasis albertisii* (Dorsal aspect of skull).
 Fig. 3c. *Liasis fuscus* (Dentition).
 Fig. 3d. *Liasis fuscus* (Dorsal aspect of skull).
 Fig. 4a. *Denisonia maculata* (Dorsal aspect of skull).
 Fig. 4b. *Denisonia devisii* (Dorsal aspect of skull).
 Fig. 5a. *Denisonia nigrescens* (Dorsal aspect of skull).
 Fig. 5b. *Denisonia pallidiceps* (Dorsal aspect of skull).
 Fig. 6a. *Demansia olivacea* (Dorsal aspect of parietal).
 Fig. 6b. *Demansia olivacea* (Dorsal aspect of prefrontal in relationship to maxillary).
 Fig. 6c. *Demansia p. psammophis* (Dorsal aspect of parietal).
 Fig. 6d. *Demansia p. psammophis* (Dorsal aspect of prefrontal in relationship to maxillary).
 Fig. 7a. *Denisonia coronoides* (Dorsal aspect of fronto-nasals).
 Fig. 7b. *Denisonia coronoides* (Ventral aspect of pterygoids).
 Fig. 7c. *Denisonia mastersi* (Dorsal aspect of fronto-nasals).
 Fig. 7d. *Denisonia mastersi* (Ventral aspect of pterygoids).
 Fig. 8a. *Denisonia nigrostriata* (Dorsal aspect of skull).
 Fig. 8b. *Denisonia gouldi* (Dorsal aspect of skull).

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