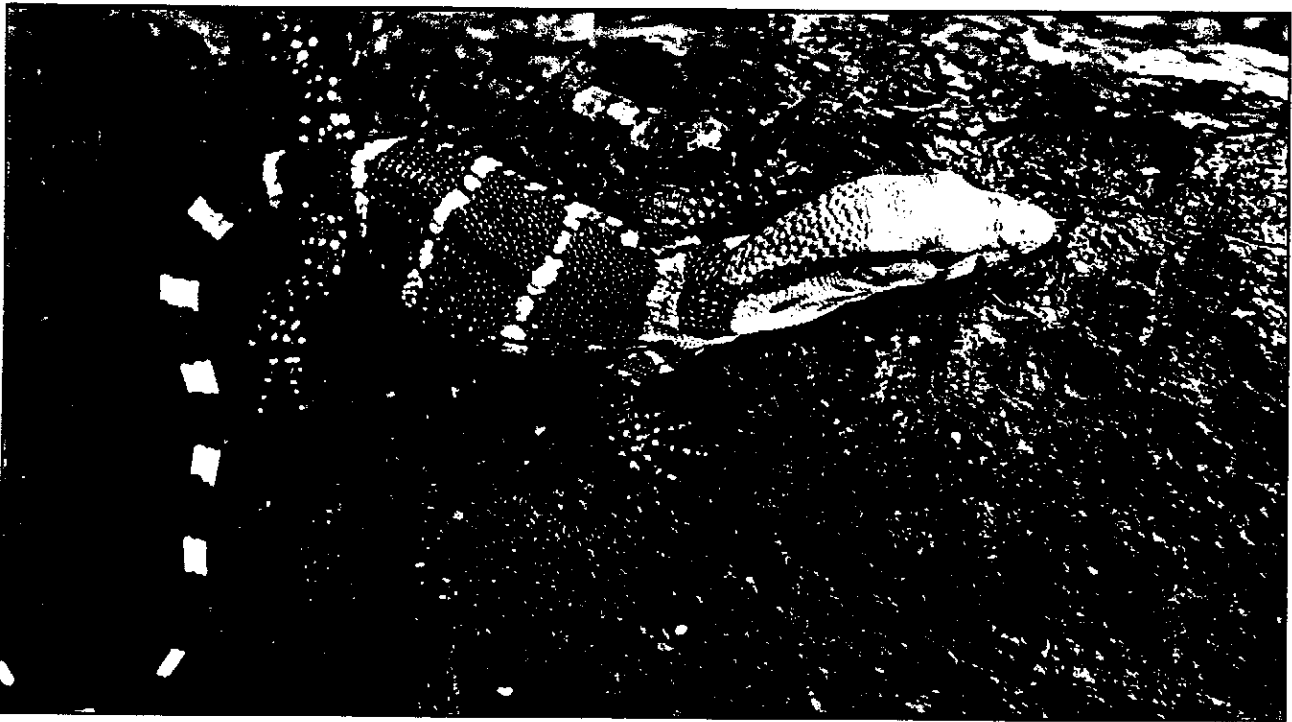


DUMERIL'S MONITOR LIZARD (*VARANUS DUMERILII*)

By
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A. Wong

My first *Varanus dumerillii* hatchling! 6 Days old when the photo was taken

Dumeril's monitor is a very large lizard from south-east Asia about which very little is known. Until a few years ago they were not uncommon in the pet trade in Europe and the U.S.A. but breeding success with the species was very limited and today they rarely appear on dealers' lists. Dumeril's monitor is completely protected in parts of its range, but nobody knows if the species is really very rare or just extremely secretive. The impression given of this animal from the literature is of a large, heavily built lizard which shelters in trees and forages for crabs and other invertebrates in forests and swamps and on seashores. Nothing is known of their breeding habits, but the eggs hatch to reveal fluorescent-orange youngsters, which may spend much of their time buried in soft earth until they develop the much more inconspicuous colouration and pattern of the adults. There are very few published

observations of this lizard in the wild; almost all of them date from more than 50 years ago and it is often difficult to be certain whether the lizards concerned really are Dumeril's monitors, because the species is often confused with others, even today. The purpose of this article is to summarise what is known about this mysterious creature, both in the wild and in captivity.

Varanus dumerillii shares its range with three other large lizards, all of which belong to the genus *Varanus*; the Asiatic water monitor (*V. salvator*), the Bengal monitor (*V. bengalensis*) and the enigmatic rough-necked monitor lizard (*V. rudicollis* - see my review of this species in Reptilian volume 1 number 9). Whilst water monitors and Bengal monitors are found in a wide range of habitats including human settlements, and are of great economic importance for their skins and flesh, both Dumeril's and the rough-necked monitors shun sites of human

habitation and seem to frequent only undisturbed mangroves and forests. There is no trade in their leather and the flesh of both species has an undeserved reputation for being poisonous. Outside the pet trade (where they fetch around £150 - an albino specimen was recently offered for sale in the U.S.A. for \$7,500) they have no economic value. The fact that there have been so few sightings of such large animals suggests that they are very rare, and it seems certain that they have already been exterminated from a large part of their previous range and survive only in dwindling patches of undisturbed habitat. Very few attempts have been made to study these lizards in the wild and most of them (including my own) have been completely unsuccessful. Asian monitors are of great ecological importance because they are large carnivores with very few natural predators. Despite their size and their ability to swal-

low large prey items whole, most of their food consists of invertebrates, which they consume in enormous numbers. An understanding of their way of life is vital if they, and the forests they live in, are to be properly conserved.

Taxonomy

Varanus dumerilii was first described by Schlegel in 1839. In 1912 specimens from northern Borneo with unusual scalation were described by Boulenger as *V. heteropholis*, later made the subspecies *V. dumerilii heteropholis* by Mertens (1942). The validity of this taxonomy has been questioned by Brandenburg (1983) and Sprackland (in press), and here they are treated as a single race.

Distribution

Location data are given in the Appendix. Dumeril's monitor is known from southern Burma and Thailand ("south of the Isthmus of Kra" (Lekagul, 1969)), peninsular Malaysia, Borneo, Sumatra and many smaller islands. They were recorded on Singapore early this century, but are certainly extinct there now. In Myanmar (then Burma) they have been noted especially on the Mergui Archipelago and adjacent mainland and said to be plentiful on Kau-ye Kyun island (formerly Sir Charles Forbes' Island - 11°N, 98.5°E) (Smith, 1930). Nutphand (no date) claimed they were "frequently" found in the southern forests of Thailand, and occasionally found in the west around Kanchanaburi province. Lekagul (1969) considered it to be commoner than *V. rudicollis* in the dense jungle south of the Isthmus of Kra.

Morphology

Maximum size claimed in the literature is 150cm (Sprackland, 1976), but no specimens over 130cm seem to have been recorded in the wild. Healthy adult

males maintained in captivity may weigh 3kg, females of 1m long may weigh 2.3kg. Weights of wild animals may be lower than this. Hatchlings weigh around 17g and have a body length of about 8cm (Radford and Paine, 1989). After six months they may have grown to almost 30cm total length. Details of morphology and scalation can be found in De Rooij 1915; Mertens 1942; Taylor 1963; Brandenburg 1983; Sprackland (in press). Krebs (1979) reported that Dumeril's monitors are able to seal their nostrils when submerged, an adaptation that may be shared with other aquatic monitor lizards. Dumeril's monitor is often confused with the rough-necked monitor, for example Coburn's (1987) photograph of "*V. rudicollis*" is actually *V. dumerilii*. The species can be distinguished mainly from the scales on the back of the neck, which are enlarged in both species, but raised and spiny in *V. rudicollis*

puncturing the shells with the needle-sharp, sparsely arranged teeth and swallowing them whole. Where crabs are absent, the bulk of the diet may consist of insects collected on the forest floor (Auffenberg 1981).

Behaviour

The most intriguing aspect of the biology of Dumeril's monitor lizard is the extraordinary colouration and pattern of the hatchlings which fades within weeks and changes to drab adult colouration within two months (first reported in Horn & Schulz 1977). More than one person has noticed the resemblance of the young lizards to hatchling king cobras. The pattern certainly looks like a mimic of a venomous or unpalatable animal and it is difficult to see how such colouration could serve as camouflage. Such talk is entirely

speculative, because there have been no observations made on hatchlings in the wild. In captivity, hatchlings may bury themselves or remain on branches above the ground. Both young and adult Dumeril's monitors are superb climbers and swimmers. Krebs (1979) reports that they can climb slippery telegraph poles with ease. According to Nutphand (no date) they are less active than other monitor species, spending most of their time sleeping in rock crevices and tree hollows. He suggests that they may habitually re-

turn to the same retreat after foraging. Smith (1930) records that they run into the sea to escape from dogs. Davis and Darling (1986) report ritual fighting between Dumeril's monitors in the manner typical of large varanids; opponents grip each other's shoulders with the forefeet whilst standing bipedally using their tails as supports and attempt to push each other over. This behaviour is generally held to occur between male monitor lizards, but problems of sex identification make this an uncertain claim. Patterns of activity in the wild are unknown. Sprackland (1976) reports that captives have two daily peaks of activity, in mid-morning and late afternoon. According to Radford and Paine



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Dumeril's Monitor Lizard

and more or less flat in *V. dumerilii*.

Diet

The stomach contents of only four animals have been examined (Losos & Greene 1988 & Brandenburg 1983); all contained crabs and one also contained a spider and an insect larva. Loveridge's (1962) claim that they eat birds needs verification. Raven (1946) records that they feed on the eggs of green turtles and Barbour (1921) that they eat ants. The ability of this lizard to feed on crabs is well documented in the literature. Krebs (1977) considered them to be specialised crab-eaters, levering off the larger appendages,

(1989) captives in north America become less active from mid August until the end of September.

Care in Captivity

In captivity this species should be provided with a very large enclosure that allows them to climb, dig and at least immerse themselves in water. Thermoregulatory behaviour of the species has not been studied, but many monitor lizards like to bask at temperatures in excess of 47°C and hot spots should be provided accordingly. There is some suggestion that the thermal preferences of the sexes may differ, but there appears to be no sexual dimorphism, although males may become longer and heavier than females. A method of sexing Dumeril's monitors that involves the use of anaesthetics and fiberoptic laparoscopy is given by Davis and Phillips (1991). The only published report of breeding is Radford and Paine (1989). A pair housed apart in 150 x 130 x 270cm enclosures were fed on rodents, horsemeat, fish and dog "chow" with vitamin and mineral supplements and were introduced to each other every August for six years. In the sixth year copulation occurred over three days and five weeks later 14 eggs were laid over eight days, of which five proved fertile. They were incubated at 26.7 - 30°C and hatched after 215-222 days. The hatchlings grew well on a diet of worms, crickets, cat food and parts of baby mice. Zimmerman (1986) gives an incubation time of 202-215 days at 28°C for eggs that were also laid in September.

According to Nutphand (no date) Dumeril's monitor is known as hao-chang-kao (white jungle monitor) in southern Thailand. In Malaysia it is sometimes known as biawak kudong (Harrison and Lim 1957)

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Appendix.

Location Data for *Varanus dumerilii*

(References not given in the bibliography can be found in Mertens (1942)).

Kuala Teku, Peninsular Malaysia.
 Mergui Archipelago and coast
 Khao Chong, Trang
 Kedah, Mallaka
 Tavoy
 Banjarmasin
 Batu
 Mergui
 Singawang
 Deli, Sumatra
 Indragiri, Sumatra
 Tenessèrim
 Nanang Raoen, Fluss Howong
 Taluk, Sumatra
 Bangka
 Solok
 Pulu Gallang, Rhiaw Archipelago
 Borgon, Baram, Sangasanga, Lahat,
 Balikpapan Borneo, Sibolga,
 Bama Sumatra
 Singapore
 Stabat Sumatra
 Serdang, Talu, Baram, Kuching,
 Pangkalan, Ampat, Buntal, Mt. Dulit,
 Rejang River, Akar River, Bogon,
 Howong River, Tandjong
 Sampit, Borneo; Bantang Kwis, Sumatra;
 Sungei Rampah, Sumatra;
 Rawang, Selangor; Penang Hill,
 below Belerctelro; Kota Tinggi,
 Johor, Malaysia

Specimens examined from Sumatra (Deli, "east coast", Talok, Serdang, Bangka and Batoe) and Borneo (Balikpapan, Banjarmasin and Nanga Raoen) (BRANDENBERG 1983).

SMITH 1922.
 SMITH 1930.
 TAYLOR 1963.
 SCORTECCI 1929.
 SMITH 1932.
 SCHLEGEL 1839.
 MULLER & SCHLEGEL 1845.
 BLYTHE 1853.
 BLEEKER 1858.
 BOULENGER 1890.
 SCHENKEL 1901.
 ANNANDALE 1905.
 VAN LIDTH DE JEUDE 1905.
 LAANG & DE ROOIJ 1905.
 BLEEKER 1860.
 MULLER 1887.
 CHASEN & SMEDLEY 1927.

SPRACKLAND in press.
 FEJERVARY 1935.
 BOETTGER 1893.

DE ROOIJ 1915.

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