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MONITOR LIZARDS

Dumeril Monitor

Varanus dumerilii

Varanus dumerilii is a dark, heavily built monitor with a broad skull from the rainforests and mangroves of South-East Asia, and it is a crab specialist. It is shy and rarely seen in the wild, but regularly turns up in the trade. Adults grow to about a metre long and need a large, warm and humid enclosure, so the species suits only an experienced keeper.

Family: Varanidae

KEY FACTS

THE ANIMAL

Adult size	**90-140 cm** total length incl. tail
Lifespan	**10-15 years**
Active	**By day**
Lifestyle	**Arboreal, terrestrial and burrowing**
Habitat	**Rainforest and wetland**
Difficulty	**Experienced**

CARE

Min. enclosure	**240 × 120 × 120 cm** L × W × H for 1 adult
Temperature, day	**27-32 °C**
Basking spot	**35-42 °C**
Temperature, night	**22-25 °C**
Humidity	**70-90%**
Water	**Water section**
UVB	**Recommended** Ferguson zone 2
Diet	**Insects, vertebrates and worms/snails**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**4-23 eggs**
Clutches per year	**1-3**
Incubation	**163-234 days** at 24-30 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Data Deficient (DD)**

About the species

Varanus dumerilii is a medium-sized to large monitor with a powerful body, a broad and deep skull and large, keeled scales on the neck, which give it a "rough" appearance. It belongs to the subgenus *Empagusia* together with *V. rudicollis*, *V. bengalensis* and *V. flavescens* and is often confused with *V. rudicollis* because of the neck scales. The tail is laterally compressed and has a crest. The species name honours the French zoologist Duméril. The species was described in 1839 by Hermann Schlegel. The later described *V. heteropholis* from Borneo is today regarded as the same species, and there are no recognised subspecies.

Adults are dark brown to almost black with irregular, paler cross-bands. Newly hatched young have a shiny orange-red or yellow head and a contrasting pattern, and the head colour fades after a few weeks. The appearance of the young possibly mimics other, better-defended animals.

Adults typically reach 100-120 cm including the tail and the largest about 140 cm. Males reach up to 130 cm with a snout-vent length of 50 cm, females about 100 cm. Newly hatched young measure about 8 cm from snout to vent and 18-24 cm in total, and weigh 10-20 g. Adult weight is not known.

The skull is broad, and the jaws crush crab shells. Even so, the species is more shy than aggressive and as peaceful as a monitor can be.

You must know what you are getting into: the animal takes up a lot of room, it lives a long time, and the diet of crabs and other shellfish costs money and must be obtained regularly.

Distribution and habitat

Varanus dumerilii is found in South-East Asia. The species lives in southern Myanmar (up to the Tavoy area) and on the Thai peninsula north to northern Kanchanaburi on the border with Myanmar, on the Malay Peninsula, in Singapore, throughout Borneo (the Malaysian, Bruneian and Indonesian parts) and on the Indonesian islands of Sumatra, Bangka, Belitung and the Riau Islands.

The range is not continuous, but depends on where there is suitable forest and water. The species is rarely seen in the wild, and there are few records. Records outside this area come from captive animals or misidentifications.

> **Native range:** Myanmar (Burma), Thailand, Malaysia, Singapore, Brunei and Indonesia.

HABITAT

The species lives in dense evergreen forest with high humidity and in mangroves, from sea level to about 900 metres. It is found both in coastal forests and far inland in evergreen forest, and also in secondary forest and in rubber and coffee plantations inside rainforest areas. Whatever the habitat, it is seldom far from water.

Crabs are a staple food. In Thailand the species lives among other places at limestone valleys with streams and many crabs, and is active there in the evening. It is mostly diurnal, but it can also be active at night, perhaps because the crabs themselves are most active after dark. The species also climbs and can stay in trees and take refuge in holes high up, but it is first and foremost tied to the ground and water.

Read more: Humidity, misting and ventilation

Care

THE ENCLOSURE

The enclosure dimensions for *Varanus dumerilii* are based on the species' length and on common practice for ground-dwelling monitors. An adult monitor of about a metre needs at least 240 × 120 × 120 cm (length × width × height) for one animal, and a pair needs more. The enclosure is often built yourself, or a whole room is fitted out. Small enclosures sold for newly hatched animals are only for the first few months, and you should expect to build the large enclosure during the first year.

The species digs and hides in holes, so the floor should be deep: 30-40 cm of a damp mixture of fertiliser-free soil, sand and bark, so that tunnels and burrows hold their shape. Make several hides at different heights and choose solid ones, because the animal is strong. Stable climbing branches and sturdy trunks are useful, because the species can climb. Plant nothing but robust plants, and expect them to be dug up.

A large, solid water tub is necessary: the animal must be able to lie in it and bathe, and the water should stay at least 25 °C. The species prefers water at about 30 °C, often lies in the pool for a long time and can sleep under the water with its nostrils closed, lifting its head to breathe every minute or every other minute. The tub must be easy to empty and clean, because the animal deposits faeces and urine in the water, and food remains get into it.

The doors must be solid and secure, and all heat sources must be shielded so that the animal cannot burn itself. Use thick glass or board. The enclosure must have good ventilation, but without draughts, so that the high humidity can be maintained.

TEMPERATURE

The species' preferred temperatures have not been measured, and the figures are an estimate based on forest-dwelling monitors. By day the air should be 27-32 °C. Over a basking spot there must be a warmer zone with a surface temperature of 35-42 °C, measured with an infrared thermometer and not as air temperature, at a distance of at least 30 cm from the lamp, so the animal can always choose. There must be a large temperature gradient in the enclosure, so the animal can warm up and cool down.

At night the temperature may fall to 22-25 °C, but the water must be at least 25 °C around the clock. The floor can be warmed gently with a thermostat-controlled heat mat under part of the enclosure, but a heat source from above is necessary to give the animal the chance to bask.

Use several thermometers at different heights and on the floor, and let a thermostat control all heat sources. An animal that lies in the corner without eating, or that moves away from the basking spot, is either too cold or too hot.

Read more: Heat and temperature

HUMIDITY AND WATER

The species comes from humid forests and mangroves, so the humidity should be high: 70-90 %, with the floor damp in depth but not wet and stagnant. The figures are borrowed from other rainforest monitors. Spray the enclosure thoroughly once or twice a day, and use the large water tub to keep the humidity up. A hygrometer shows whether it is working.

The animal drinks from the water tub, and the water should be changed daily or every other day, because it quickly becomes dirty. The humidity should not turn into a constantly wet floor and mould, so ventilation must be good. Shedding can go badly if the air is too dry: if remains are left on the toes and tail, a warm bath helps.

LIGHTING AND UVB

The species is mostly diurnal and uses the sun, so UVB light is recommended. Keep it in Ferguson zone 2: a high-output UVB tube (T5 HO) or a combination lamp, mounted over the basking spot so that the UV index is about 1-3 under the lamp, with shade in the rest of the enclosure. Tubes should be replaced according to the manufacturer's recommendation, typically every year, because the UVB output falls long before the light stops shining.

The light is switched on for 12 hours a day and controlled by a timer. The night should be dark, and heat lamps with visible light should be switched off at night. Use bulbs in fittings that are shielded so that the animal cannot come into contact with them. Natural sunlight through a window is not enough and can make the enclosure too hot.

Read more: Lighting and UVB

FEEDING

Varanus dumerilii is a crab specialist. Its jaws and behaviour are built for taking crabs apart: the animal shakes its prey, first breaks off the claws and legs using the ground for support and finally crushes the carapace. The instinct is there already in newly hatched juveniles, and crabs trigger a stronger hunting response than insects, prawns, lizards, rodents, eggs and frogs. In the wild the species also takes snails and other molluscs, insects, fish, frogs, turtle eggs, birds and small rodents.

Even animals that have been fed other food for years take crabs at once when they are offered. To break the carapace, the monitor presses the crab against an edge, a wall or the pool edge with great force; on a smooth floor the animal slides backwards and has to give up, so there must be a firm surface, stones and edges at the feeding place.

In captivity the staple food is therefore crabs and other shellfish: freshwater crabs, prawns, crayfish and snails, preferably with the shell, so that the animal gets calcium and has to work for its food. Give them thawed if they are frozen, and buy them from a source that is safe from parasites. Supplement with insects (crickets, grasshoppers, dubia roaches), eggs, fish and now and then a mouse or a day-old chick. Fish, eggs and chicks are taken readily, while mealworms, snails and frogs may be refused, and a few animals are very fussy.

A few animals take only mice and refuse everything else, but rodents as the staple food cause obesity and liver problems in a species that lives on crabs and other invertebrates in the wild. Keep rodents to a small part of the diet.

Frequency and amounts are not documented for the species. Subadults are fed every day or every other day with small portions, adults 2-3 times a week. Dust insects with calcium and vitamin D3, and give a multivitamin a couple of times a month. Adjust to the animal's condition: the ribs should not be visible, and the tail and limbs should be round, not fat.

Read more: Feeder animals: keeping and breeding Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

V. dumerilii is shy and cautious, but like all monitors it is an animal with sharp claws, strong jaws and a tail that can be used as a whip. A bite from an adult monitor of about a metre can cause deep wounds and must be treated. The claws scratch, and the tail can cause pain. The jaws are built to crush crab shells, and injuries can be serious.

Held by the neck and hips, the animal often goes completely still, while it lashes out violently if it is held by the tail. Never grab the tail. Some animals in captivity live peacefully and dig themselves in for most of the day, but that is no guarantee.

Tame the animal slowly. Open the enclosure calmly, speak quietly, and let it get used to your hand before you pick it up. Use short, calm sessions, and support the whole body when you lift. Many animals should not be handled at all. Use long tweezers when feeding so that the animal does not associate your hand with food.

Wash your hands thoroughly with soap after touching the animal, enclosure and food, and wipe up water and faeces with disposable cloths, because reptiles often carry *Salmonella*. Children and people with a weakened immune system should not touch the animal.

The species is kept singly or as a pair, and in a pair both animals must be able to get away from each other. Males must not be kept together. Watch for bites and stress, and separate them if it goes wrong.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

The animals become sexually mature at a total length of about 100 cm, the females probably at 4 years of age. Weight at sexual maturity is not known. Males and females look alike externally, and probing is unreliable in monitors, so the sex is most reliably determined by ultrasound or endoscopy at a vet with experience in reptiles. There are more males than females in captivity, so it can be difficult to get a pair. Expect that the animals must be fully grown before they are put together for breeding, and that the female must be in good condition and have received plenty of calcium.

MATING

The species breeds in captivity, typically when the animals are kept as a pair in a large enclosure. A temporary separation of the sexes can promote breeding, and the female must have a laying box. The male must be able to get away from the female, and there must be hides and screening so that the animals do not see each other all the time. Watch for bites, and separate the animals if the female is injured. Whether a cool period or a change in day length triggers mating is not known.

EGG-LAYING AND CLUTCHES

The female lays from 4 to 23 eggs per clutch and up to three clutches a year. Prepare for egg-laying by giving the female a large laying box or a deep, damp floor (at least 30-40 cm) where she can dig and lay the eggs. Without a suitable place she may retain the eggs, and they can become stuck. A gravid female often eats less and seeks more heat. Give her extra calcium and plenty of food before and after laying.

INCUBATION

The eggs are carefully removed without being turned and placed in a box with damp vermiculite or perlite, with an amount of water that keeps the substrate damp but not wet. Incubation lasts 163-234 days at 24-30 °C. Keep a stable temperature, for example 29-30 °C. Expect a long incubation of 5-8 months and some losses: eggs that are not viable and dead, fully developed embryos occur, and half of a clutch can be lost. Open the box briefly to air it.

Read more: Incubating eggs

REARING THE YOUNG

The juveniles are about 8 cm from snout to vent at hatching, 18-24 cm in total, and they weigh 10-20 g. The tail is slightly longer than the body. They have a pale orange-red or yellow head, which fades after a few weeks. Rear them singly in small enclosures with hides, water and high humidity, at the same temperatures as the adults.

Give them small crabs, prawns, snails and insects. Crabs make them eat at once, even as newly hatched juveniles. Feed them every day, and weigh them regularly. After a month the juveniles typically measure 24-26 cm and weigh 16-17 g, after about two months 25-28 cm and 19-22 g, and after five months the snout-vent length is about 13 cm. The species has been bred in captivity for at least five generations, so captive-bred animals exist, but the time to adult size is not known.

Read more: Buying animals: captive-bred, wild-caught and transport

Health and common mistakes

Varanus dumerilii is hardy when temperature, humidity and food are right, but most problems are caused by husbandry and the animal's background. The typical faults are:

- Wild-caught animals. The species has been imported in large numbers from Indonesia, which in 2010-2018 exported up to 1,060 live animals a year. Even so, adult animals that are probably wild-caught are offered for sale. Wild-caught animals often have internal and external parasites, are stressed and draw on the body's reserves. Have a faecal sample examined by a vet, and keep new animals apart from other monitors for several weeks.
- Too low a temperature or no basking spot. This causes poor digestion, a weakened immune system and respiratory infections (wheezing, mucus in the nose and mouth, open mouth).
- Air that is too dry and too little water. This causes problems with shedding and dehydration.
- A lack of UVB and calcium. This causes bone weakness with soft jaws and bent limbs, especially in young animals.
- Too many fatty prey animals. Mice as the staple food cause obesity and liver disease in a species that lives on crabs.
- Wounds and burns from unshielded heat sources and from the animal hurting itself on the glass if it is stressed.
- Skeletal deformities occur in captive-bred juveniles. The cause is not known, but incubation and the female's condition are generally suspected in monitors.

A healthy animal has clear eyes, a round tail and limbs and eats with appetite. See a vet with experience of reptiles if the animal loses weight, will not eat, is constipated or wheezes.

Always ask someone who knows

This guide is a good place to start, but it cannot replace experience. Animals differ, and much of what matters most is learned from people who have kept the species for years. Talk to a breeder, an experienced keeper or a vet who knows reptiles and amphibians before you get the animal - and again if anything looks wrong.