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MONITOR LIZARDS

Mertens's Water Monitor

Varanus mertensi

Varanus mertensi is a dark, semi-aquatic monitor from rivers and lagoons in northern Australia, with a compressed tail that works like an oar and nostrils that can be closed under water. The species is threatened in the wild, and although it has been bred in captivity, its care is only sparsely described. It needs a large facility with a deep water section.

Family: Varanidae

KEY FACTS

THE ANIMAL

Adult size	**80-120 cm** total length incl. tail
Lifespan	**10-15 years**
Active	**By day**
Lifestyle	**Terrestrial and semi-aquatic**
Habitat	**Savanna, rocky terrain and wetland**
Difficulty	**Expert**

CARE

Min. enclosure	**250 × 120 × 120 cm** L × W × H for 1 adult
Temperature, day	**28-32 °C**
Basking spot	**40-50 °C**
Temperature, night	**22-25 °C**
Humidity	**60-80%**
Water	**Water section** depth 40-60 cm
Water temperature	**26-30 °C**
UVB	**Essential** Ferguson zone 3
Diet	**Insects, vertebrates and worms/snails**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**10 eggs**
Incubation	**200-300 days** at 28-31 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Endangered (EN)**

About the species

Varanus mertensi is a medium-sized monitor that is dark brown, olive-grey or almost black above, with small, black-edged, greyish-white to yellowish-white spots scattered without a fixed pattern. The spots often form rows at the base of the tail. The head is olive-brown with a light ring around the ear opening, and the lips are barred in dark grey and brownish white. The underside is whitish to yellowish with irregular grey bands, spots or a net pattern, while the throat is unpatterned.

No other monitor is so well adapted to life in water. The tail is strongly compressed from the sides and has a double keel, so that it works like an oar. The nostrils face upwards and can be closed under water, and the animal can swallow its prey under water. It is the only monitor known to use its sense of smell to find prey under water.

Adults reach 80-120 cm in total length. Snout-vent length is up to about 48 cm, and the tail is 1.4-1.8 times as long as the body and head. Weight is not documented. The species was described in 1951 and is named after the herpetologist Robert Mertens. The name *V. bulliwallah* from 1956 is now regarded as a synonym.

It is a diurnal species that often basks on rocks and branches over the water and drops into the water when disturbed. The species is not a common terrarium animal. It has been bred many times in Europe since the 1960s, but its care is only sparsely described, so several of the figures in the guide are borrowed from related, aquatic monitors.

For anyone considering the species: an adult animal of about one metre needs a home-built facility or a room of at least 250 × 120 cm, where a large part is deep, filtered and heated water. Water changes, filters and heating are a constant chore and a continuing expense for at least 10-15 years.

Distribution and habitat

Varanus mertensi is native to northern Australia. The species is found from the Kimberley region in northern Western Australia across the Top End in the Northern Territory and the Gulf Country to the western side of the Cape York Peninsula in Queensland. The type locality is a cattle station near Halls Creek in the eastern Kimberley.

It is found at rivers, waterholes, lagoons and swamps along the coast and inland and is seldom far from water. All recorded finds of the species are in Australia. Populations have declined sharply in large parts of the Northern Territory and Queensland, because the animals eat the toxic, introduced toad *Rhinella marina*, which has spread across northern Australia. The species is therefore now listed as endangered (EN) on the IUCN Red List. Locally, for example in the Kimberley, it is still common.

> **Native range:** Australia.

HABITAT

Varanus mertensi lives in wetlands and along watercourses in tropical Australia, where the year is divided into a wet and a dry season. It is seen at the water's edge along rivers, in lagoons, in seasonally flooded ponds and along artificial watercourses, and in the Kimberley also at gorges and rock edges along streams. The animal basks on rocks and branches in or over the water and takes to the water when in danger. It has been seen sleeping under water.

Foraging takes place both on land and in water. The main food is freshwater crabs, and in addition fish, frogs, crayfish, shrimps, other arthropods, carrion and eggs, including turtle eggs, which it digs up. The species has a good sense of smell. The eggs are laid in a chamber about 30 cm below the surface in a bank, some way above the waterline. Egg-laying falls around the transition from the wet season to the dry season. The climate is warm all year with heavy rain in the wet season, and the water level in the rivers varies greatly.

Care

THE ENCLOSURE

An adult needs a facility of at least 250 × 120 × 120 cm (length × width × height), with enough water for it to swim. Two animals need at least 50 % more floor area. Larger is better, because the species swims and moves a lot. A large part of the floor must be water, and the rest land with a basking spot, deep substrate and hides. Juveniles can start in a smaller enclosure with a shallow water section, but must move to the large facility within a few years.

Land: a deep layer of soil and sand that the animal can dig in, and where a female can dig a nest burrow. Place flat stones and thick branches in and over the water as basking spots, as in the wild. Make several hides with two exits on land and among dry stones. All heat sources must be shielded, so that the animal cannot burn itself, and the doors must be lockable, because monitors are strong and try to get out.

The water needs a powerful filter that can cope with a monitor's waste, and a floor without sharp edges. All furnishings must be fixed in place or so heavy that they cannot be moved.

Read more: Heat and temperature

TEMPERATURE

Varanus mertensi comes from a warm, tropical climate and needs a clear temperature gradient.

The air must be 28-32 °C by day, and the basking spot must have a surface temperature of 40-50 °C, measured with an IR thermometer. Surface temperature must not be confused with air temperature. The animal must be able to choose between the basking spot, a warm zone and a cooler part. At night the heat is switched off and the temperature falls to 22-25 °C.

The water is kept at 26-30 °C. Water that is too cold makes the animal sluggish and inhibits digestion. Use thermostats on all heat sources, and measure air, surface and water. No winter rest has been documented in the enclosure, and the species lives in a climate without cold winters.

HUMIDITY AND WATER

The humidity in the enclosure should be 60-80 %. With a large water section the humidity holds almost by itself, so the most important thing is good ventilation, so that the air does not become heavy and stagnant. It is not documented whether the humidity should vary with the seasons in captivity.

The land section must be damp enough for the burrows to hold their shape, but not so wet that it goes mouldy. Let part of the land section dry out between mistings. The animal drinks from the water section.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water section is the heart of the facility, and the animal must be able to swim and dive in it. The water must be 40-60 cm deep over part of the floor, and there must be a flat edge or a ramp, so that the animal can easily get up and down.

The water is kept at 26-30 °C. The animal fouls the water a lot, so it must be heavily filtered, and a large part of it must be changed regularly. Use clarified water without chlorine. Clean the water section thoroughly, because monitors can transmit salmonella through the water.

Read more: Quarantine and hygiene

LIGHTING AND UVB

Varanus mertensi is diurnal and basks a lot and therefore needs strong light and UVB. The facility must have a basking spot in Ferguson zone 3, so that the animal can choose between a UV index of about 3-6 at the basking spot and shade in the rest of the enclosure. Use a powerful UVB tube or a UVB metal halide lamp at a good distance above the basking spot, and replace tubes according to the manufacturer's instructions, because UVB output weakens long before the tube stops glowing.

The light must be on 11-13 hours a day, slightly longer in summer and slightly shorter in winter. The basking spot must be the brightest place in the facility. Light and heat must be switchable off at night.

Read more: Lighting and UVB

FEEDING

In the wild *Varanus mertensi* lives mostly on freshwater crabs and also on fish, frogs, crayfish, shrimps, other arthropods, eggs and carrion. This is difficult to imitate fully in captivity.

Juveniles and adults can be given a mixture of whole fish, shrimps and crayfish, large insects such as grasshoppers and cockroaches, snails, eggs and occasionally mice. Rodents must not become the main food: the species does not eat them in the wild, and they are fatty, so an animal that gets many becomes fat and can develop liver problems.

Vary the food, so that the animal gets crustaceans, fish and insects. Feed juveniles every day or every other day and adults two to three times a week in suitable amounts. Dust the food with calcium and occasionally with vitamins, but be careful with extra D3 when the animal has UVB. Some fish contain an enzyme that breaks down vitamin B1, so fish should not be the only food. Remove food remains from the water, so that they do not rot.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

Safety: *Varanus mertensi* is strong and fast, and even an animal of one metre has sharp claws, powerful jaws and a tail that can lash hard. The species normally flees into the water, and an animal that cannot get away can bite and lash with its tail. Expect that an adult can inflict deep wounds. Always support the whole body, and hold the forelegs and the base of the tail when lifting the animal.

Tame a new animal calmly. Give it several weeks to settle before you handle it. Approach slowly, and let the animal get used to the hand at feeding. Keep handling short, and stop if the animal puffs itself up, hisses or lashes its tail. An animal that becomes used to taking food from the hand can mistake a hand for food, so always use tweezers.

Monitors can carry salmonella. Wash hands and arms thoroughly after contact with the animal, the water and the furnishings, and never use the kitchen sink or the bathtub to clean the enclosure's items. Children, pregnant women and people with weakened immune systems should not have contact with the animal or the water.

The species is best kept singly. How the animals get on together outside mating is not described, so never keep two animals together without an extra large facility and close supervision.

Breeding

SEXUAL MATURITY AND SEXING

It is difficult to see the sex of *Varanus mertensi*. A method for sexing adults has been described, but it requires experience, and juveniles cannot be sexed reliably from the outside. Age at sexual maturity is not documented, either in the wild or in captivity. In related monitors of the same size it typically occurs after two to four years.

MATING

The breeding season is not sharply defined: in the wild the animals mate between December and July, and gravid females are seen from January to June. The species has been bred in captivity since 1965. If two animals are to be put together, it must be done in a very large facility with many hides and the ability to separate them at once, because the male can become violent towards the female.

EGG-LAYING AND CLUTCHES

The female digs a chamber about 30 cm below the surface in a bank. Clutch size is known only from a single nest of 10 eggs, and the number of clutches per year is not documented. In captivity the female needs a large, deep land section with damp, workable soil where she can dig her burrow, otherwise she may retain the eggs. She must have plenty of food and calcium up to laying, and if she fails to lay, a vet with experience of monitors must see her.

INCUBATION

The eggs are incubated in an incubator in damp substrate such as vermiculite or perlite, and they must not be turned. Incubation takes 200-300 days depending on temperature. The eggs are incubated at 28-31 °C. Too high a temperature can harm the embryos, and whether sex depends on temperature has not been investigated.

Read more: Incubating eggs

REARING THE YOUNG

Newly hatched juveniles swim at once, and in the wild they take to the water immediately. The juveniles are about 24 cm long at hatching and need a smaller facility with a shallow water section, many hides and a warm basking spot. Give small insects, shrimps and small fish in small amounts every day, dusted with calcium. Keep the juveniles separately, so that they do not stress each other, and so that you can check that each one eats.

Health and common mistakes

Diseases in *Varanus mertensi* itself have not been described in detail. The typical problems for large, semi-aquatic monitors in captivity are:

- Temperatures that are too low and too little UVB. This causes poor digestion, weak growth and metabolic bone disease. The animal must be able to warm up to a high surface temperature, and the UVB tube must be replaced on time.
- Obesity and liver problems, especially with too much rodent food and too little movement.
- Parasites, especially in wild-caught animals. Have a faecal sample examined, and have the animal seen by a vet when it is new.
- Skin and claw diseases from dirty water or water that is too stagnant.
- Burns from unshielded heat sources.
- Salmonella, which the animal can carry without being ill and which can infect humans. Good hand hygiene is a requirement.
- Stress, if the animal does not have hides and a large enough facility.

See a vet with experience of monitors if the animal stops eating, loses weight, is lethargic, has swellings, difficulty breathing or pus in the mouth. The species has been bred in Europe for decades, but how large a proportion of the animals in the trade are captive bred is not documented. Wild-caught animals have a greater risk of parasites, stress and illness, so always ask about origin and papers.

Read more: Common diseases and signs of illness Read more: Buying animals: captive-bred, wild-caught and transport

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.