herpy

MONITOR LIZARDS

Tricoloured monitor lizard

Varanus yuwonoi

Varanus yuwonoi is a rare, brightly coloured monitor from the forests of Halmahera in Indonesia, with a black forebody, a hind body finely speckled with green, blue and black, and a blue tail. Animals in the trade are almost all wild-caught, and its care and breeding are almost unknown. It belongs with very experienced keepers who have room for a whole room.

Family: Varanidae

KEY FACTS

THE ANIMAL

Adult size	**100-150 cm** total length incl. tail
Lifespan	**10-15 years**
Active	**By day**
Lifestyle	**Terrestrial**
Habitat	**Rainforest**
Difficulty	**Expert**

CARE

Min. enclosure	**300 × 150 × 180 cm** L × W × H for 1 adult
Temperature, day	**26-30 °C**
Basking spot	**40-45 °C**
Temperature, night	**23-25 °C**
Humidity	**70-90%**
UVB	**Recommended** Ferguson zone 3
Diet	**Insects and vertebrates**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**4-9 eggs**
Incubation	**164-166 days** at 29 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Vulnerable (VU)**

About the species

Varanus yuwonoi belongs to the so-called blue-tailed monitors in the *Varanus indicus* group. It is recognised by a blue, strongly compressed tail with a distinct double keel at the far end, large black spots on the sides of the neck and a back whose front third to half is black with a few broad bands, while the rear half of the body is finely speckled with green, blue and black. The throat is without bands. The tongue is dark purple at the outer end and pink at the base, and the tongue tips can be yellow to light blue. The head is relatively robust, and the teeth are far longer than in the closest relatives.

The species was described in 1998 by Michael B. Harvey and David G. Barker, and the name *yuwonoi* honours the Indonesian biologist and herpetologist Frank Bambang Yuwono. The brightly coloured pattern makes it much sought after in the international animal trade, and local hunters catch it. Even so, it is one of the least known monitors of all, because it is hard to find in the wild. The largest known animals are a male of 150 cm and a female of 137 cm in total length, and the snout-vent length reaches 53 cm in the female. The tail is about 1.6 times as long as the body. Animals of 146 cm are not necessarily fully grown, and some probably grow larger. The lifespan is not known; 10-15 years is an estimate.

The striking colour pattern breaks up the animal's outline when it lies on the forest floor and has probably evolved so that prey do not notice it. Juveniles have a clearer pattern than the adults: the spots on the hindbody can be orange, the tail has sharp black and blue bands, the hind legs have blue-green to turquoise dots, and the snout has dark cross bands. Differences between the sexes are not described.

Lifelong commitment: an adult *V. yuwonoi* is a large, strong and potentially biting monitor that lives many years. It requires a home-built enclosure or a whole room, strong heating, UV light, a food bill for whole animals in larger quantities and daily time. The animals in the trade are probably almost all wild-caught, and husbandry and breeding are not described. That makes the species a task for very experienced monitor keepers who are prepared to learn along the way.

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

Distribution and habitat

The species is found only on Halmahera, the largest island in the Moluccas in Indonesia. The first animals were collected at Jailolo on the island's north-western arm. Later it has been found at the villages of Akesahu and Kao on the west side of Kao Bay, and in 2014 an animal was seen about 12 km north of Weda on the southern arm. That extended the known range to the south.

The species probably occurs across the whole island, which is mostly covered in rainforest. Reports of similar animals on the nearby islands of Morotai, Bacan and Obi have not yet been confirmed, so the map shows only Halmahera.

> **Native range:** Indonesia.

HABITAT

The species is a forest monitor. It lives in primary and secondary lowland forest and has been found from below 50 up to about 300 metres above sea level. Unlike its relative *Varanus rainerguentheri*, which on Halmahera lives mostly in mangrove and coastal vegetation, the species keeps to forest. It can, however, move about in rainforest right at the edge of the mangrove, close to the coast.

On Halmahera the temperature in the lowlands is 25-30 °C all year, and 1,500-2,000 mm of rain falls a year, mostly from December to March. Rain and cloud can last for days or weeks, and longer dry periods are rare.

Traps for the species are set at the nesting mounds of megapodes (large heaps of soil and plant material in which the birds incubate their eggs). The species is probably an ambush predator: the powerful head, long teeth and camouflaging pattern suit a predator that lies still at places such as the nesting mounds, where pigeons, lizards, snakes, invertebrates and newly hatched chicks pass by. It probably also digs in the mounds for eggs. Its diet in the wild has not been studied. The species can be on the move in the evening, so it is not exclusively diurnal.

Care

THE ENCLOSURE

The figures for the care and breeding of *Varanus yuwonoi* are borrowed from the closely related *Varanus melinus* in the same group, or are estimates.

An adult monitor of 100-150 cm needs a home-built enclosure or a whole room of at least 300 × 150 × 180 cm (length × width × height). A pair needs an even larger enclosure that can be divided in two. One-year-old animals can live singly in glass enclosures of 100 × 50 × 60 cm and then two or three together in 150 × 90 × 80 cm. Young animals must be moved up as they grow.

Furnish with a deep substrate of bark chips or mixed soil and bark so that the animal can dig and hide, and many hiding places in the form of cork tubes and boxes. Provide climbing branches and raised resting places; the largest animal claims the highest. A large water tub to bathe and dive in is a plus, and the water must be changed regularly. Use secure doors with a lock, and shield all lamps with mesh so that the animal cannot burn itself. Keep the animal alone: conspecifics in the whole group that *V. yuwonoi* belongs to are aggressive towards each other, and in *V. melinus* communal keeping can end in fatal bites.

TEMPERATURE

In the wild it is 25-30 °C all year round in the lowlands. In the enclosure there must be a large temperature gradient. By day the background temperature should be about 26-30 °C, and under the basking spot the surface should reach 40-45 °C, measured with an infrared thermometer. At night the temperature may fall to 23-25 °C. Juveniles should have up to 40 °C under the basking spot. The climate on Halmahera gives no reason for a winter rest or a cool period.

Provide the heat from several bulbs in combination, and control them with a thermostat. Shield the bulbs so that the animal cannot touch them, and measure the surface temperature with an IR thermometer. Watch for an animal that stays lying under the bulb without moving, or that keeps away from the basking spot: both can mean that the temperature is wrong.

Read more: Heat and temperature

HUMIDITY AND WATER

The species lives in a humid forest climate with no dry season. Keep humidity at 70-90 % with daily misting and a moist substrate, especially at the bottom, where the animal digs.

Keep the substrate moist, but not wet, and ensure good ventilation so that mould does not develop. Provide a large water bowl or tub where the animal can drink and bathe. Change the water daily, as monitors often foul it.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

The species is diurnal and basks, so it needs bright light and UVB. Use UVB tubes or UVB bulbs together with one or more basking lamps so the animal can choose between sun and shade. Ferguson zone 3 is a good starting point. Measure the UV index with a UV meter, and replace tubes and bulbs as the manufacturer recommends. Keep the light on 12 hours a day and dark at night.

Read more: Lighting and UVB

FEEDING

The diet in the wild has not been studied, but the species probably takes birds, lizards, snakes and invertebrates around the nest mounds and digs for eggs. Give mice, fish or poultry once a week and now and then insects, especially locusts. Do not give rodents as the main food: monitors easily become fat and develop fatty liver if fed too many mice. Alternate between insects, whole fish, eggs and a few whole rodents.

Juveniles get crickets and locusts every other day and small mice now and then, given with tweezers so that all get an equal share. They are so greedy that you must take care not to overfeed them. Give calcium with vitamin D3 on the insects and now and then a vitamin and mineral supplement, for example sprinkled on chopped ox heart mixed with hen's egg.

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

BEHAVIOUR AND HANDLING

The species is aggressive when handled. It has a relatively powerful head and very long teeth, so a bite can cause deep wounds, and the claws and tail can inflict nasty scratches, so do not take hold of the animal without considerable experience. Wild-caught animals are often stressed and defend themselves vigorously. Give them peace and hides, and handle them as little as possible.

Move slowly in the enclosure, and let the animal come to you. When the animal eats calmly from tweezers and no longer flees, you can begin to work in the enclosure. Keep your hands clean and wash them thoroughly after every touch of the animal, the food, the water and the enclosure, because monitors can carry salmonella.

Keep the animal alone. Conspecifics in the group are aggressive towards each other, and in *Varanus melinus* shared housing can lead to deaths. Only put a male and a female together for a short period and only in a very large enclosure.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

Sex differences and age at sexual maturity are not known for *Varanus yuwonoi*. In the related *Varanus melinus* the male is larger than the female (snout-vent length about 50 cm against 40 cm), but that cannot simply be transferred. Leave sexing to a vet with experience of monitors.

MATING

Mating is not tied to a season: it starts as soon as the sexes are put together, and the male is separated from the female about two weeks later. Keep the animals under close supervision, and make sure the female can get away, because bites can be fatal.

EGG-LAYING AND CLUTCHES

The female lays 4-9 eggs, and there are about three months between clutches. The female needs a laying box, for example a hollow log of 80 × 50 × 25 cm, half filled with peat soil, leaves and a layer of sphagnum, so that she can lay the eggs undisturbed. A gravid female is more easily recognised by a large appetite than by a thicker body. An overlooked clutch can be revealed by eggshells in the droppings, because the animals eat the eggs.

INCUBATION

Place the eggs on top of a mixture of vermiculite and sand (2 parts vermiculite to 1 part sand) without turning them, and cover the egg box with plastic film so that the air stays saturated with moisture. Remove the film at least once a week to air it out. At 29 °C the eggs hatch after 164-166 days. Expect that some eggs do not develop or contain dead embryos.

REARING THE YOUNG

The juveniles are about 27-28 cm in total length and weigh about 33-35 g at hatching. Rear them in glass enclosures of 100 × 60 × 75 cm with branches, cork and bamboo tubes, plants and daily misting with rainwater at 26-32 °C and up to 40 °C under the basking lamps. Offer crickets after four to five days; the juveniles often take them only after the tenth day. A few weeks later small mice are added, and after that they get crickets and locusts every other day and small mice now and then. Feed them with tweezers so that all get an equal share, and weigh them regularly: some juveniles grow faster than others. If unrest develops, separate them.

Health and common mistakes

Exports from Indonesia in the years 2010-2017 were given as 25-110 animals a year, declared as captive-bred or born in captivity. How many of them were really bred is uncertain: monitors that are rarely or never bred are almost exclusively wild-caught in the trade. Wild-caught animals often have intestinal worms and other parasites and have been exposed to stress, dehydration and poor treatment during capture and transport. There are no established breeding lines, and diseases of the species have not been described, so the following is based on related monitors.

- Parasites: have a faecal sample examined by a vet with reptile experience, and keep a new animal in quarantine for several weeks before it is moved in.
- Dehydration and emaciation after transport: offer fresh water, and weigh the animal regularly.
- Burns from unshielded heat sources: cover all bulbs.
- Obesity and fatty liver from too much fat, especially if the main food is rodents.
- Lack of calcium and vitamin D3 if UVB and supplements are missing. It causes soft bones.
- Respiratory infections and sepsis: related monitors can die of bacterial blood poisoning, pneumonia and cysts in the abdominal cavity. Breathing with an open mouth, mucus and sneezing are warning signs.
- Salmonella: monitors can carry the bacterium without being ill, so wash your hands after any contact with the animal and the enclosure, and do not let children or vulnerable people touch the animal.

A healthy animal has clear eyes, a full tail and a steady weight. See a vet with reptile experience if the animal loses weight, does not eat for several weeks, breathes with an open mouth or seems lethargic.

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.