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MONITOR LIZARDS

Ridgetail Monitor

Varanus acanthurus

Varanus acanthurus is a small, fast and inquisitive monitor from the dry rocky country of Australia, with a tail covered in spiny scales and yellow spots on a dark background. It grows to about 60 cm, is diurnal and lives mostly on insects. In return, it needs a large custom-built enclosure, a deep and damp digging substrate, very hot basking spots, UVB and a lifespan of at least 15 years.

Family: Varanidae

KEY FACTS

THE ANIMAL

Adult size	**45-70 cm** total length incl. tail
Lifespan	**15-20 years**
Active	**By day**
Lifestyle	**Rock-dwelling, terrestrial and burrowing**
Habitat	**Semi-desert, savanna and rocky terrain**
Difficulty	**Intermediate**

CARE

Min. enclosure	**150 × 75 × 120 cm** L × W × H for 1 adult
Temperature, day	**24-38 °C**
Basking spot	**55-65 °C**
Temperature, night	**20-24 °C**
Humidity	**20-50%**
Water	**Water dish**
UVB	**Recommended** Ferguson zone 3
Diet	**Insects and vertebrates**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**4-18 eggs**
Incubation	**90-150 days** at 28-30 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Least Concern (LC)**

About the species

Varanus acanthurus is a slender, short-legged monitor with a pointed snout, a long forked tongue and a tail that is round in cross-section and covered in strongly keeled, spiny scales. The scales form light and dark rings, and they are what gave the species its name: the scientific name probably comes from the Greek akantha, thorn, and oura, tail. The back is reddish brown to dark brown with pale yellow to cream spots, and the head has pale stripes that continue down over the neck. The stripes on the neck separate the species from the closely related, similar species *V. primordius* and *V. insulanicus*. The underside is pale and unmarked.

The animal grows to 45-70 cm including the tail, and most adults are around 60 cm. The tail is 1.3-2.3 times as long as the head and body together. Males are on average slightly larger than females and have a broader, more angular head. Females are smaller and have a narrower, more pointed head. In the wild the colour matches the soil and rocks the animal lives on, so animals from red soil are reddish and animals from yellow rocks are yellowish.

The species was described in 1885 by George Albert Boulenger. It has previously been divided into several subspecies, but since 2022, on the basis of DNA and appearance, *V. acanthurus* has been regarded as a single species without subspecies. The animals on Groote Eylandt and the Wessel Islands now belong to *V. insulanicus*. The "red" and "yellow" animals in the trade are colour forms and say nothing certain about origin.

It is an intelligent and active monitor. It can be tamed, but it is not a pet to be picked up every day. Australia does not export wild animals, so almost all animals outside Australia are captive bred, and they are easy to obtain. Be clear about what you are taking on: an adult needs an enclosure 150 cm long or more, materials for a deep digging layer, powerful heating and UVB tubes that must be replaced regularly, and live insects every other day for 15 years or more. Food, electricity and time are the big running costs, not the animal itself.

Read more: Lighting and UVB

Distribution and habitat

Varanus acanthurus lives in northern and central Australia. It is found in northern Western Australia, in the Northern Territory and in western and north-western Queensland, and it has also been reported from South Australia. To the west it reaches Carnarvon and Broome, to the east Mount Isa, and to the north the Kimberley, the Top End and the Gulf of Carpentaria.

The islands off the coast, Groote Eylandt and the Wessel Islands, no longer belong to the species, since those animals have been assigned to *V. insulanicus*. Records outside this area on the map are due to captive animals or misidentifications.

> **Native range:** Australia.

HABITAT

The species is associated with dry, rocky ranges, rock outcrops and sandy or stony ground where spinifex grass grows in tussocks. It lives mostly on the ground and shelters in crevices between rocks, under flat stones and in burrows that it digs itself. It only rarely hides in spinifex. It is diurnal, and it basks in the middle of the day.

Even in dry regions there is more moisture than you might think. At Alice Springs the mean relative humidity is 22-38 % by day and 30-47 % at night, and inside the burrows the air is far more humid, up to 90 %. About 70 % of the water requirement is met by food, and time spent underground limits water loss.

The eggs are laid in dug tunnels, typically 80-250 cm down, but sometimes only 40 cm. Several females may share the same large burrow. The females carry eggs from August to November.

Read more: Humidity, misting and ventilation

Care

THE ENCLOSURE

An adult needs an enclosure of at least 150 × 75 × 120 cm (length × width × height). That size usually requires a custom build or an order from a manufacturer, because the standard enclosures in the trade are too small. Bigger is better. Juveniles can live in an adult-sized enclosure from the start if there are plenty of hides and the food is easy to find. That saves you buying several enclosures along the way.

The most important part of the setup is the substrate. The species digs, and a deep substrate gives protection against overheating, better fluid balance and worn claws. The substrate should be at least 30 cm deep for a male and 45 cm for a female, and 60 cm is a good target. Females also lay eggs without a male, and if the substrate is too shallow, she may retain the eggs and die of egg-laying difficulties. Use a mixture of two parts fertiliser-free garden soil and one part play sand, possibly with a little fine clay (no more than 20 %), so that the tunnels hold. The substrate must be damp enough to clump, so that it does not collapse. Avoid coconut fibre, bark, wood shavings, gravel and paper, and never use calcium sand. Make a barrier of glass or strong board, 60 cm high, so that the substrate stays in the enclosure. A glass front at the bottom lets you see what the animal is doing underground.

Furnish it with flat stones, pieces of bark and half pipes as hides, and build a basking spot, which is the highest place in the enclosure, from slate, flat stones or concrete tiles. Fix the stones in place so that the animal cannot dig under them and be crushed. The enclosure should have good ventilation, preferably with a mesh lid, and a front opening makes access easier.

Heat lamps must sit in ceramic fittings and be shielded with a guard so that the animal cannot touch the bulb, and doors must be lockable, because monitors are fast and good at escaping. Clean daily for droppings and soiled substrate, and replace the substrate completely every 12 months.

Read more: Heat and temperature Read more: Calcium, vitamins and supplements

TEMPERATURE

Varanus acanthurus needs a large temperature gradient. The basking spot should have a surface temperature of 55-65 °C, measured with an infrared thermometer about two hours after the lamps are switched on. Start at the low end and follow the animal's behaviour. The air at the basking spot is 29-38 °C, and the cool end should be 24-28 °C. The air in the enclosure is thus 24-38 °C by day, from the cool to the warm end.

The animal must always be able to move away from the heat. If the whole enclosure is hot, it can die of heatstroke. Use at least two halogen spots or infrared heating units side by side, so the basking spot warms the whole body evenly. Measure with digital thermometers, and check the basking spot regularly, because bulbs lose output over time. At night the heat is switched off, and the temperature follows the room. Ordinary room temperature of 20-24 °C is sufficient.

Too low a temperature causes obesity, gastrointestinal problems, gout and a weakened immune system. The animal basks briefly several times a day, not all day.

A cool period in winter, during which the heat is gradually reduced, is recommended for breeding animals and is a good habit for others. For example, cut down from 14 hours of heating in summer to 4 hours in winter. Food should be available all year.

HUMIDITY AND WATER

The relative humidity in the enclosure should be 20-50 %. That is more than in a true desert and corresponds to what the animal meets in its homeland. More important than the air is the substrate: it must be damp enough to hold the tunnels, so that the humidity down in the tunnels is 80 % or more, as in a natural burrow. Pour the water onto the substrate with a watering can with a rose, and moisten it again when the substrate dries out.

Always keep a shallow bowl of fresh water in the enclosure. The bowl must not be deeper than the animal's back. The animal gets much of its water through its food, but without free access to drinking water it can become dehydrated and have problems shedding and with constipation. Change the water when it is dirty, and scrub the bowl once a week. Use tap water or spring water, not distilled or softened water.

LIGHTING AND UVB

The species is diurnal and basks in the middle of the day, so it needs strong light. Fit a daylight tube or an LED lamp of 6,400 K over the enclosure in addition to the heat lamps, and avoid coloured lamps, also at night.

UVB is strongly recommended. Animals can live and even breed without UVB if they get plenty of D3 through their food, but D3 in food is difficult to dose correctly, and UVB also gives other benefits. The species belongs to Ferguson zone 3: a T5 HO tube of 10-14 % over the basking spot in a reflective fitting that covers about half the length of the enclosure. The aim is a UV index of 4-6 at the animal's head on the basking spot and lower elsewhere. The distance between tube and head is typically 20-45 cm, depending on mesh and lamp, and it should be checked with a UV meter. Replace the tubes according to the manufacturer's instructions.

Switch the light on for 10.5-13.5 hours a day, longest in summer and shortest in winter. A timer makes it easy.

FEEDING

The species is insectivorous. In the wild the diet consists mostly of grasshoppers, beetles and cockroaches, supplemented with spiders, millipedes, woodlice, caterpillars, cicadas and snails. Lizards make up a smaller part of the numbers but a large part of the volume. Plant material is only eaten by accident.

Give a varied diet of well-fed insects: dubia roaches, crickets, grasshoppers, mealworms, superworms, silkworms, woodlice and millipedes. The insects should be about as large as the animal's head. The diet should be low in fat, and the key is variety. Now and then give frozen lizards, quail eggs or a newborn mouse, but sparingly, because the animal otherwise becomes fat. Eggs and mice are not a large part of the natural diet.

Juveniles are fed daily with as much as they can eat until they are about 6 months old. Subadult and adult animals are fed every other day, as much as they can eat in 5-10 minutes. Breeding females can be fed daily and have more to eat. Small, frequent meals are healthier than large, infrequent ones.

Dust the insects lightly with calcium without D3 at most feedings. A vitamin and mineral supplement with vitamin A (retinol) and not beta-carotene is used occasionally. Give the insects a nutritious gut-load diet for at least a day before feeding, and use captive-bred insects, not wild-caught, so that you do not bring in parasites. Let the animal hunt, because it is good exercise and enrichment.

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

BEHAVIOUR AND HANDLING

Varanus acanthurus is a clever and inquisitive monitor that remembers its keepers and past experiences. It is relatively easy to tame compared with other monitors, but taming takes time. Juveniles are nervous and skittish until they approach adulthood at around one year of age. After that they become bolder. Give a new animal a couple of weeks in peace. After that, be present at and in the enclosure every day, and let your hand rest in it so that the animal can smell and lick it. Do not stare, do not touch and do not grab the animal when it is hiding. Never approach from above with a claw-like hand, because birds of prey are natural enemies and the animal reacts to anything that resembles one. Let the animal climb onto your arm.

The species is small, and the injuries are minor. It rarely bites people, and only out of extreme fear; a bite is normally superficial. It can whip its tail when frightened, and the tail is spiny. The fine claws can cause small, red scratches and light rashes if you handle the animal with bare arms. The animal is very fast, so hold on firmly, and never handle it in a room where it can escape. Closed eyes, fleeing and tail whipping are signs of stress, and then you should take a break.

Like all reptiles, monitors can carry salmonella. Wash your hands with soap after all contact with the animal, enclosure and food, and do not let small children touch the animal unsupervised.

Keep males apart. They fight and can seriously injure or kill each other. Females can also be aggressive towards each other. A pair can be kept together, but it requires a substantially larger enclosure and supervision, and there is no guarantee that two animals can live together. If blood is drawn, the pair must be separated. Larger animals may eat small ones, so do not keep animals of very different sizes together. The species is not social and does perfectly well alone. Provide enrichment, for example hunting live insects and food from tweezers.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

Males are usually larger than females and have a broader, more angular head and rough scales under the tail that give grip. Females have a narrower, more pointed head and smooth scales under the tail. The sex can be guessed from this, but the surest method is to shine a light through the base of the tail and look for the hemipene structures (transillumination). Appearance alone is not reliable.

Size at sexual maturity is not reliably documented. Females can lay fertile eggs at two years of age. Only breed a female when she is fully grown and in good condition, because a female that is too young or thin will be drained of strength.

MATING

In the wild, mating follows the warmth, the rain and plentiful food. A cool period in winter, when the heat is gradually reduced, gives a better breeding season, and the animals should be in good condition before mating. In the wild, mating can for example take place in October after a rainy autumn, on a warm, sunny day.

Put the male in with the female in her enclosure, and keep watch at least for the first few days. He flicks his tongue and tries to grip her by the neck. Mating lasts a few minutes and can be repeated over up to five days. The male can become violent and bite the female on the head and forelimbs, so be ready to separate the animals if she gets wounds. Gestation lasts two to four weeks.

EGG-LAYING AND CLUTCHES

The female lays her eggs about 2-4 weeks after mating. A clutch contains up to 18 eggs, and how many clutches she lays a year is not known.

The female digs a tunnel in the substrate and lays the eggs there. The enclosure must therefore have a damp, deep substrate, at least 45 cm, preferably more, and ideally a separate laying box. Without a suitable place she may retain the eggs, and that can cause egg-laying difficulties, which can be life-threatening. Females also lay unfertilised eggs without a male. They do not

hatch and can be removed. Give the female plenty of food both before and after, so that she can rebuild her strength.

INCUBATION

Carefully dig up the eggs, and do not turn them. They are placed in a closed container where they lie on a grid above a damp base of perlite and water, so that they do not touch a wet surface. The container should have small air holes, for example two of 4 mm in the lid, because a container without ventilation in an airtight incubator can cause pressure differences, so that eggs can burst when the door is opened. A cracked egg can be repaired with a small piece of old, softened eggshell from another monitor species, pressed on with the remaining egg white. A repaired egg can hatch normally together with the rest of the clutch.

The incubation period is 3-5 months. The exact incubation temperature is not known; 28-30 °C is an estimate. Eggs incubated too warm can produce juveniles with abnormal stripes on the back, so keep the temperature stable and avoid overheating. Captive-bred animals can have malformations of the hyoid.

Read more: Incubating eggs

REARING THE YOUNG

Newly hatched juveniles measure about 15 cm. Put them in an enclosure built in the same way as the adults': deep, damp substrate, hides, basking spot and UVB. The juveniles are more nervous than adults, so give them plenty of hides and peace.

Feed them daily with small insects, as much as they will eat, for example small crickets, dusted with calcium. Digestion is fast, often within 24 hours. The juveniles grow quickly, and after about six months they can move on to eating every other day. Weigh them regularly, and keep an eye on growth. Taming works best if you are simply present for long periods without touching them; they become bolder around one year of age. Separate the juveniles as they approach sexual maturity, because males fight.

Health and common mistakes

Most diseases are caused by faults in the setup, especially too little heat, too little UVB and too one-sided a diet. The typical problems are:

- Metabolic bone disease from too little UVB and calcium. Provide UVB and dusted insects.
- Obesity from too many fatty food animals such as mice and eggs, and too little exercise.
- Gout and gastrointestinal problems from too low a temperature and too little water.
- Constipation and intestinal blockage if the animal is too cold, dry or ill. Fine sand is rarely the cause, while bark and shavings are riskier.
- Egg-laying difficulties in females that cannot lay eggs: too shallow a substrate, lack of calcium or too little heat. It is life-threatening and requires a vet.
- Mites and internal parasites. New animals should be quarantined for at least three months.
- Shedding problems from air that is too dry and too little moisture in the substrate.
- Respiratory infection and prolapse.
- Gas in the abdominal cavity (pneumoperitoneum) can occur after transport: the belly swells up, and the animal can die within a day. An animal with a swollen belly must go to a vet at once.

A healthy animal has clear eyes, a strong muscular body, a well-filled tail and straight limbs and spine. It eats regularly, breathes with its mouth closed and is active and inquisitive. Weigh the animal regularly, because sudden weight loss is often the first sign of illness. Reptiles hide illness, so see a vet experienced with reptiles if the animal loses weight, does not eat, breathes with its mouth open or seems lethargic. An annual health check is recommended.

Australia does not export wild animals, so almost all animals in the trade outside Australia are captive bred. Wild-caught animals usually have more parasites and are more stressed, but captive-bred animals can also have mites and worms, so always check for mites, clear eyes and a round tail, and make sure the hip bones are not visible.

Read more: Common diseases and signs of illness

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.