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LACERTIDS

Argentine Black and White Tegu

Salvator merianae

Salvator merianae is the largest of the tegus: a powerful, intelligent, diurnal lizard from eastern and central South America with black and white bands. Males reach up to 150 cm and weigh several kilos. The species needs a purpose-built enclosure of at least 300 × 150 × 150 cm, a deep, humid digging substrate, strong heat and UVB, and it lives for 15-20 years. In the wild it spends 4-6 months of the year in brumation.

Family: Teiidae Former name: *Tupinambis merianae*

KEY FACTS

THE ANIMAL

Adult size	**80-150 cm** total length incl. tail
Weight	**2,500-8,000 g**
Lifespan	**15-20 years**
Active	**By day**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Savanna, dry forest and rainforest**
Difficulty	**Experienced**

CARE

Min. enclosure	**300 × 150 × 150 cm** L × W × H for 1 adult
Temperature, day	**24-35 °C**
Basking spot	**52-57 °C**
Temperature, night	**20-23 °C**
Humidity	**70-80%**
Water	**Water dish**
UVB	**Essential** Ferguson zone 3
Winter rest	**15-20 °C** 17-22 weeks
Diet	**Insects, fruit, plants, vertebrates and worms/snails**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**24-36 months**
Clutch size	**18-25 eggs**
Clutches per year	**1-2**
Incubation	**40-75 days** at 29-30 °C

PROTECTION AND PAPERWORK

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

About the species

Salvator merianae is the largest of the tegus: a heavily built, muscular lizard with a broad, triangular head, strong legs and a long tail that is round in cross-section. Adults are black with white to greyish white bands and spots that form horizontal rows along the body. Newly hatched young have an emerald-green snout and forebody with black markings. The green turns black over the first months, and the tail has yellow bands that fade with age into faint dots. The tail can be shed, and it is used as a whip against enemies.

Males reach 120-150 cm including the tail and up to 50 cm from snout to vent. They develop heavy cheeks because the jaw muscles grow, especially in the breeding season. Females are clearly smaller, up to about 90 cm, and weigh 2.5-7 kg. A newly hatched young weighs about 10 g and can weigh 8 kg after four to five years. Growth is fastest in the first two years of life and stops around the fourth.

The species was described in 1839 as *Salvator merianae* in honour of the naturalist and artist Maria Sibylla Merian. From 1845 and for more than 150 years it was confused with *Tupinambis teguixin* and regarded as the same species. In 1995 it regained species status as *Tupinambis merianae*, and in 2012 it returned to the genus *Salvator*. Older literature and many distribution maps therefore mix the two species together. *T. teguixin* is pale yellow and black, stays much smaller and has round spots on the hind legs. Animals sold as blue are a colour form of *S. merianae*; the blue tone only appears around sexual maturity. Where the range meets *Salvator rufescens* in central Argentina, the two species hybridise naturally.

S. merianae is a highly intelligent lizard that can be trained and learns to know its keeper. It is still not a pet in the sense a dog is: it bites, scratches and lashes with its tail when frightened or cornered, and young animals of about 45-75 cm go through a phase in which they are defensive and irritable. An adult needs an enclosure that most homes have no room for, a diet that costs a great deal and 15-20 years of care. Animals that are kept well can live for more than 20 years.

Distribution and habitat

Salvator merianae lives in eastern and central South America. It is found in large parts of Brazil, from Rio Grande do Sul in the south to Ceará and Rio Grande do Norte in the north-east and west to Amazonas, and also in Uruguay, Paraguay, eastern Bolivia (Santa Cruz and Beni) and northern and eastern Argentina (including Formosa and Corrientes). The type locality is the state of Rio de Janeiro.

Many distribution maps are wrong, because the species was long confused with other tegus. The map shows the original range. Escaped and released animals have formed populations in Florida and Georgia and have been seen in South Carolina; they are not part of the species' natural range.

> **Native range:** Brazil, Uruguay, Paraguay, Bolivia and Argentina.

HABITAT

Salvator merianae lives in forest, forest edges, savanna and scrub. Vegetation cover matters less than the soil, which must be diggable: the animals live in self-dug burrows and are also found near flooded meadows, canals, ponds and streams. By day they bask and reach a body temperature of 32-35 °C. At night they retreat to the burrow.

The annual rhythm is clear. From spring to autumn the animals are active, and in the cool, dry winter they lie in the burrow without feeding for 4-6 months. The brumation is deep, and the metabolism falls to about a fifth. The body temperature in the burrow is around 17-21 °C. After brumation comes the breeding season, and the females build a nest of dry grass, twigs and leaves and stay with it. During the reproductive season, in the South American spring from September to December, the animals keep a body temperature that is several degrees above that of the burrow at night, because they produce heat themselves. This is unusual for a lizard.

The species is omnivorous and opportunistic. It takes insects, snails, spiders, crustaceans, frogs, lizards, snakes, small mammals and birds, eggs and carrion, and large amounts of fruit and seeds. Adults eat more plant matter than young.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

An adult male needs an enclosure of at least 300 × 150 × 150 cm (length × width × height), and an adult female at least 240 × 120 × 120 cm. Enclosures this large must be built or ordered specially. Bigger is better. Young animals grow very fast and must move to larger enclosures, often several times in the first two years.

The animal digs, and the substrate is the most important part of the setup. Provide a deep layer, ideally 30-60 cm, at least at one end. A mix of about 40 % fertiliser-free garden soil, 40 % coconut fibre and 20 % play sand with a layer of leaf litter on top holds moisture and is good to dig in. Coconut husk, cypress mulch and eucalyptus mulch also work. Avoid dry sand, potting compost with additives and pine and spruce shavings. Replace the whole substrate at least every quarter, and remove waste continuously.

The enclosure should have a front opening and mesh in the roof for ventilation and secure mounting of lamps. The animal knocks over lamps that are not fixed, so fasten them well and shield them. The door must be lockable, because the animal is strong and can jump almost a metre. Provide a large, low water bowl that the animal can get into and out of. Tegus drag substrate into the water and defecate in it, so change the water daily. Also provide a hide box with damp sphagnum, where the humidity is 90-100 %, and several dry hides.

The animal is kept singly. Two animals can be kept together in an enclosure twice as large, but it may not work. A male and a female are not kept together outside the breeding season, and small animals are not kept with large ones, because the small ones may be eaten.

Read more: Humidity, misting and ventilation

TEMPERATURE

Salvator merianae needs a clear gradient. The basking spot has a surface temperature of 52-57 °C, measured with an infrared thermometer. The warm side of the enclosure is 32-35 °C and the cool side 24-29 °C. All light and heat are switched off at night, so that the temperature falls to 20-23 °C and the animal sleeps more deeply.

Use halogen spots or incandescent bulbs, which give heat similar to the sun's. Ceramic heaters and heat mats give weak heat and are not suitable for the basking spot. An adult is too large for a single bulb, so place several bulbs close together so that the whole body is warmed evenly. In an enclosure 120 cm high, bulbs of about 100 W are a starting point; the output depends on distance, room temperature and mesh. Measure regularly, and avoid dimmers, which reduce the deep-penetrating heat.

Brumation is optional in captivity. In the wild the animals brumate for 4-6 months at 17-21 °C; in the enclosure a rest of 4-5 months at 15-20 °C is suitable. A healthy adult can also be kept active, fed and heated all year, and that is the right choice for young in their first year, newly acquired animals, underweight animals and all animals whose health is uncertain.

If you want to give a winter rest, follow the rules in the theme on brumation: only healthy animals in good condition, a run-down over several weeks and an empty gut before the temperature is lowered. The theme's fasting times cover animals up to 3 kg; for tegus of several kilos there is no established rule, so the fast should last at least a month, and the temperature is kept above 13 °C while the gut empties. Reduce the day length and the heat gradually, then switch off the lamps, and keep 15-20 °C with a deep, damp digging layer and access to drinking water. Weigh the animal before the rest and at regular intervals, and end the rest if it loses weight markedly or seems ill. Waking takes 3-5 days: raise the temperature and the light gradually, give water first, and offer food when the animal is active and warm.

Read more: Heat and temperature

HUMIDITY AND WATER

The humidity in the enclosure should be 70-80 %. Keep it up by watering the substrate until it is evenly damp but not muddy, and repeat this weekly, and by misting daily. Several short mistings work better than one long one. Measure with two hygrometers, one at the warm and one at the cool end, because the cool side is more humid than the warm side.

The hide box with damp sphagnum gives a local humid spot of 90-100 %, and the moss is replaced often so that it does not go mouldy. The animal must always have fresh drinking water.

LIGHTING AND UVB

Salvator merianae is diurnal and needs strong light and UVB for 12-14 hours a day. In addition to the heat bulbs, the enclosure needs powerful daylight lighting that illuminates at least half of its length, for example strong LED fixtures. When the weather allows, direct sun in a secure outdoor cage is a good supplement.

The species belongs to Ferguson zone 3. Use a T5 HO tube of 10-14 % in a fixture with a reflector over the basking spot, so that the tube covers about half of the enclosure's length. The aim is a UV index of 3-4 at the basking spot and lower elsewhere, so that the animal can choose. Without mesh, the distance between tube and back is typically 43-55 cm depending on the tube; mesh absorbs part of the UVB, and the distance must then be shorter, ideally checked with a UV meter. The tubes lose output and are replaced according to the manufacturer's instructions.

Read more: Lighting and UVB

FEEDING

Salvator merianae is omnivorous and needs a varied diet. An adult gets about 60 % animal food, 30 % vegetables and 10 % fruit. Young under a year get about 90 % animal food, mostly insects, and 10 % greens with a little fruit now and then. In the wild the stomach contents of adults are 30-60 % plants, mostly fruit, but in captivity fruit is given sparingly, because the

animal moves less and easily becomes fat.

Young up to 6 months are fed 5 times a week, 7-12 months 4 times, 1-2 years 3 times and adults 2 times a week. The portion is about the size of the animal's skull. Whole prey should be slightly smaller than the skull, because tegus do not chew their food and can choke.

Animal food: cockroaches, crickets, grasshoppers, mealworms, silkworms, earthworms, snails (preferably with shell), chicks and quail, mice, rats, rabbit, minced chicken or turkey with calcium, heart, whole fish, prawns and crayfish. Whole prey is better than meat, because it contains calcium and other nutrients. Minced meat and insects are dusted with calcium and multivitamin. Frozen prey is thawed in the fridge and warmed to about body temperature before it is given. Eggs are preferably given boiled, because raw egg white contains avidin, which prevents the absorption of biotin. Fish that contain thiaminase (for example herring, mackerel, smelt and tuna) are given boiled, because the substance breaks down vitamin B1.

Greens: dandelion, kale and other cabbages, carrot, courgette, pumpkin and pepper, washed and cut into small pieces. Never give avocado, onion, spinach, lettuce, broccoli or aubergine.

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

BEHAVIOUR AND HANDLING

Salvator merianae is intelligent and curious and can learn to respond to its name, solve small tasks to reach food and follow simple commands. The animals can become very tame if they are accustomed to people from a young age with calm and persistent handling. Young are shy and try to flee. Let them get used to your hand, touch them while they eat so that they learn the difference between hand and food, and approach from the side, never suddenly from above.

Around 18-24 months of age, when the animal is 45-75 cm long, it goes through a period of some months in which it is defensive and irritable, even if it has been tame. Give it peace and space, and use heavy gloves if it has to be handled. The period passes. An adult has a powerful bite, sharp claws and a tail that can strike like a whip, so keep your distance when the animal is frightened. Never disturb it in its hide.

The animal digs, climbs and explores and needs variety: a deep digging substrate, hides, branches and large stones. Wash your hands after contact with the animal and the enclosure, because *Salmonella* is common in reptiles.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

The animals reach sexual maturity around their third year, when the females weigh about 1.5 kg. Males are larger than females and develop large, muscular cheeks, which grow further in the breeding season. Females should be fully grown and in good condition before they are bred, and all breeding animals must be healthy.

MATING

In the wild the animals mate in spring after brumation. Males become active and territorial, and the females follow the males' scent trails. In captivity the male and female are kept apart outside the breeding season and are put together under supervision once they have woken and eaten again. Watch for bite wounds, and separate the animals if the male keeps biting.

EGG-LAYING AND CLUTCHES

The female usually lays one clutch a year, typically 18-25 eggs, but a clutch can be 7-66 eggs, and the largest clutches come from large females. A clutch weighs about 40 % of the female's weight. Females in captivity can lay two clutches a year. In the wild the female builds a nest of dry grass, twigs and leaves and stays with it and defends it. Provide the female with a deep, damp digging layer, dry nesting material and peace. If she digs for a long time without laying, or becomes lethargic, she must go to a vet.

INCUBATION

The eggs hatch after 40-75 days, on average about 64 days, depending on the temperature. A stable temperature around 29 °C gives the most hatched eggs and the largest young. At 32 °C or at temperatures fluctuating between 25 and 35 °C, the eggs develop faster, but fewer hatch and the young are smaller. Incubation medium and humidity are not documented for the species; in the wild the eggs lie in a nest of plant material in the soil.

Read more: Incubating eggs

REARING THE YOUNG

The young weigh about 10 g and are 17-25 cm long. They grow very fast and are fully grown after four to five years. They are given insects and small prey five times a week and need calcium, UVB and plenty of heat. Keep the young separated by size, because large animals eat small ones. Young are kept active and fed through their first winter.

Health and common mistakes

Most problems are caused by mistakes in husbandry. The typical ones are:

- Metabolic bone disease from too little calcium, vitamin D or UVB, with soft jaws and crooked legs.
- Obesity from too much fatty meat, too many rodents, too much fruit and too little exercise. Weigh the animal regularly; a sudden weight loss is a warning sign.
- Respiratory infections from too low a temperature or a substrate that is constantly wet.
- Burns, if the animal can reach the heat bulbs. Shield them.
- Vitamin B1 deficiency from a lot of raw fish with thiaminase and biotin deficiency from many raw eggs.
- Intestinal worms and other parasites, especially in imported animals. New animals should be quarantined and have a faecal sample examined.
- Problems with shedding from air that is too dry.
- Egg-laying difficulties in females without a suitable place to dig.
- Weight loss or illness during or after a winter rest in animals that were not in good condition.

The animal must go to a vet with reptile experience if it loses weight, stops eating outside a winter rest, breathes with an open mouth or seems lethargic.

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.