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ANGUIDS

Mexican Beaded Lizard

Heloderma horridum

Heloderma horridum is a large, black and yellow-spotted venomous lizard from the tropical dry forests on Mexico's Pacific side, larger than *Heloderma suspectum*. A bite is a medical emergency. The species grows to 60-90 cm, burrows and climbs, feeds on eggs and small vertebrates, and requires experience, firm routines and safe handling.

Family: Helodermatidae

KEY FACTS

THE ANIMAL

Adult size	**60-90 cm** total length incl. tail
Weight	**800-2,000 g**
Lifespan	**20-30 years**
Active	**At dusk and at night**
Lifestyle	**Arboreal, terrestrial and burrowing**
Habitat	**Semi-desert and dry forest**
Difficulty	**Expert**

CARE

Min. enclosure	**180 × 80 × 60 cm** L × W × H for 1 adult
Temperature, day	**22-32 °C**
Temperature, night	**20-24 °C**
Humidity	**40-60%**
Water	**Water dish**
UVB	**Recommended** Ferguson zone 2
Winter rest	**15-20 °C** 8-12 weeks
Diet	**Vertebrates**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**36 months**
Clutch size	**3-13 eggs**
Incubation	**208 days** at 26 °C

PROTECTION AND PAPERWORK

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

About the species

WARNING: *Heloderma horridum* is venomous. The venom is produced in modified salivary glands in the lower jaw and runs along grooves in the teeth into the wound while the animal holds on and chews. There is no antivenom. A bite causes severe, prolonged pain, swelling, weakness, sweating and a drop in blood pressure, and in rare cases swelling of the mouth and throat with difficulty breathing, shock and disturbances of the heart rhythm. A bite is a medical emergency, even when the wound looks small. Almost all bites happen when someone prods a captive animal with a finger or a bare foot. The animal is large and strong, and an animal that has bitten and holds on is hard to remove. Keep this species only if you are willing to take the precautions seriously every single day: the section on behaviour has the safety rules, and the section on health explains what to do after a bite.

Heloderma horridum is a large, heavy, short-legged lizard with a broad head and a thick tail that stores fat. The scales are small, bead-like and non-overlapping, and most have a small bony plate (osteoderm) inside; the belly has none. The base colour is black with yellow spots or bands, and the head is almost always plain black. The tail is longer than in *Heloderma*

suspectum, about 40 % of the total length, and it does not regrow if it breaks off. The tongue is pink and forked and is used to follow scent trails.

Adults measure 33-48 cm from snout to vent and reach 60-90 cm including the tail. They typically weigh around 800 g, large animals over 2 kg and the very largest up to 4 kg. The male is slightly larger than the female and has a broader head, but the sexes look alike. The species was described in 1829 by Arend Wiegmann. The species name comes from Latin horridus, "rough" or "bristly". The former subspecies are now regarded as separate species: *Heloderma exasperatum*, *Heloderma alvarezi* and *Heloderma charlesbogerti*. Many of the distinguishing features vary so much that the place of origin and genetics are often the only reliable way to tell them apart.

The species is slow and spends most of its time hidden. When the animal emerges, it moves slowly and clumsily, but it becomes more alert and more inclined to bite as evening and night go on. The venom contains compounds that are being researched as a basis for diabetes drugs.

Distribution and habitat

Heloderma horridum lives in Mexico on the Pacific side, from Sinaloa southwards through Nayarit, Jalisco, Colima, Michoacán, Guerrero, Morelos and Oaxaca to Chiapas, with records from Durango, Zacatecas and western Puebla. The species occurs from sea level to about 1,500 m.

The closely related *Heloderma exasperatum*, *Heloderma alvarezi* and *Heloderma charlesbogerti* each live in their own dry-forest area in north-western Mexico, in Chiapas and in Guatemala. Animals from Guatemala therefore do not belong to this species.

> **Native range:** Mexico.

HABITAT

The species lives in tropical deciduous dry forest and thorn scrub and, at higher elevations, in pine and oak forest. It shelters in burrows, under stones and among roots, and climbs trees to raid nests.

The dry forests have a long dry season in winter and spring and a rainy season from about July. In the dry season the animals leave their shelter in the late afternoon, warm up quickly to over 30 °C and cool slowly again in the evening. Activity peaks in May, when *Ctenosaura pectinata* lays its eggs, and the eggs are an important prey. In winter the body temperature rarely falls below 15 °C, so the species does not have a true cold brumation.

The fat reserve in the tail carries the animal through the dry season. The eggs are laid in late autumn, and the young emerge with the rains the following summer. The young animals are rarely seen and probably spend most of their first 2-3 years underground.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Little documented knowledge exists about the care of *Heloderma horridum*. The advice is based on the climate of the dry forests, on the size and way of life of the species, and on the far better known *Heloderma suspectum*, which has the same requirements for safety, substrate and food. Many of the figures below are borrowed from it or are estimates.

An adult needs an enclosure of at least 180 × 80 × 60 cm (length × width × height). The size is an estimate: the species is larger than *H. suspectum* and climbs, so there must be room for both floor and branches. The enclosure must be completely secure and have a lock, so that the animal cannot get out and children and unauthorised people cannot open it.

The substrate is a diggable mixture of sand and soil, at least 10-15 cm deep, with both dry and damper areas. Newspaper, bark and wood shavings are unsuitable. Provide hides at both ends, stable climbing branches, large stones and a heavy, flat water bowl that cannot be tipped over. Stones and hides are placed directly on the floor or fixed in place so that the animal cannot dig under them.

Arrange the enclosure so that feeding and cleaning can be done without hands near the animal's head. Use long tongs for cleaning, and never put your hands in while the animal is out.

TEMPERATURE

The enclosure should have a gradient from 22 to 32 °C by day; active animals keep a body temperature of around 30 °C. Under the heat lamp there is a warmer spot, and the animal must be able to move away from the heat. At night the temperature falls to 20-24 °C. Measure the temperature in several places with digital thermometers.

The species does not need a cold brumation like *H. suspectum*. A cool, dry period of 8-12 weeks in winter at 15-20 °C and with shorter days matches the dry season in the wild. Only healthy animals in good condition are cooled down. Food is stopped 2-3 weeks beforehand, while the animal is still warm, and the animal must have water throughout the period.

HUMIDITY AND WATER

Humidity is 40-60 %, and part of the substrate is kept slightly damp so that the animal can dig into moister soil. A completely dry substrate causes problems with shedding, while a constantly wet substrate causes skin infections, so the moisture must be local. In summer, corresponding to the rainy season, a little more misting is fine.

A heavy, flat water bowl, large enough for the whole animal, is available at all times. The animal likes to lie in water. Change the water at least every 3-4 days and immediately when it is dirty. Juveniles are misted lightly at least every other day.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

The species is most active in the late afternoon, at dusk and at night, but a fixed lighting rhythm gives a natural daily cycle. The light is on for 10-13 hours a day, shortest in the cool period. UVB is recommended: a UVB spot or a UVB tube at the basking spot. Ferguson zone 2 is an estimate, with a UV index of around 1-2 at the basking spot and shade in the rest of the enclosure. Replace the UVB source according to the manufacturer's instructions.

Read more: Lighting and UVB Read more: Heat and temperature

FEEDING

In the wild the species feeds mainly on eggs from birds and reptiles and on nestlings. It also takes small birds, mammals, frogs, lizards and insects. The fat reserve in the tail carries it through the dry season.

In captivity the species does best on small vertebrates: whole, thawed mice and rats and day-old chicks. Quail eggs are used for variety, and egg smeared on the prey can get new animals to eat. An adult is well served by one meal every one to two weeks in the active period; give less if the tail becomes sausage-thick. Juveniles get one small prey item once a week.

Always use tongs of at least 30 cm, never your fingers, and let the animal release the prey itself. Dust occasionally with calcium and a multivitamin.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

SAFETY: the animal is venomous and strong. It bites and holds on and can turn surprisingly fast, especially in the evening and at night. Follow these rules:

- Never touch the animal with bare hands. Move it with a hook or long tongs, preferably into a closed box, and use thick gloves and tongs of at least 30 cm when feeding.
- Support the animal under the chest and hindquarters if it must be lifted. Never grab it by the neck with your fingers.
- Never have the animal out of the enclosure without another adult nearby who knows what to do.
- Never handle the animal after drinking alcohol. Alcohol recurs in several of the most serious bites.
- Keep children and other pets away, and never show the animal off by letting anyone touch it.
- Have a plan before anything goes wrong: tongs and a flat object to release the animal, and what you will say when you call 112 (see the section on health).
- A bite must always be seen by a doctor, even a small one. Even a superficial, scraping bite with the front teeth can cause severe symptoms.

A threatened animal gapes, hisses and turns towards the danger. That many animals become calm in captivity is a risk, not a benefit.

The species is kept singly. Males fight for hours by lying on top of each other and pushing. A pair can be put together in a large enclosure and under supervision when breeding is intended. Always wash your hands after contact with the animal, substrate and food, as reptiles can carry salmonella.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

The male is slightly larger than the female and has a broader head, but the sexes look alike, and sex is difficult to determine externally, especially in fat animals. The reliable method is ultrasound at a vet, or an observed mating or egg-laying. The species can become sexually mature as early as the third year of life. Breeding requires healthy, weight-stable animals in good condition.

MATING

In captivity breeding can succeed at any time of year. Males fight ritualised combats that can last several hours, and the winner mates with the female. The animals are only put together under supervision, with tongs or a board ready to separate them. The female can reject the male by biting and must be able to retreat.

EGG-LAYING AND CLUTCHES

In the wild the eggs are laid in late autumn, from the end of October to the beginning of December. A clutch is typically 3-13 elongated eggs, exceptionally up to 30. The female digs them in about 12 cm deep in the soil and leaves them. The enclosure needs a deep, damp area to dig in, and without a suitable place she may retain the eggs. The eggs are removed without being turned. The female is exhausted after laying and needs food and peace.

INCUBATION

The eggs are incubated in a closed box with damp vermiculite or perlite and a humidity close to 100 %. At a constant 26 °C incubation takes on average about 208 days, that is almost 7 months, and in the wild 7-9 months. At hatching the yolk sac has been drawn into the belly.

Read more: Incubating eggs

REARING THE YOUNG

Rearing has not been described for the species itself, so the method is borrowed from *H. suspectum*. Each hatchling is kept separately at first in a small box with paper, a shallow water bowl and a hide at 26 °C. Later small groups can be put together, and after a few months they are moved to a larger enclosure.

The first meals are a thawed newborn mouse whose head has been dipped in egg yolk, or a quail egg. Some hatchlings eat straight away, others only after a couple of weeks. Use thick gloves and tongs of at least 30 cm, because the hatchlings are venomous too. One feeding a week is enough. Mist at least every other day.

Health and common mistakes

BITE: A bite from *Heloderma horridum* is always a medical emergency, even when the wound looks small. The venom causes severe, burning pain that begins within minutes, peaks after 1-2 hours and can last for several days. The swelling often spreads far beyond the bite site. Weakness, dizziness, nausea, vomiting, sweating, palpitations and a drop in blood pressure are common. In rare, severe cases the tongue, lips and throat swell so that breathing becomes difficult, and shock and disturbances of the heart rhythm can occur. Bites close to the trunk (abdomen, shoulder, upper arm, calf) more often have a severe course than bites to a finger, and a previous bite can make a person hypersensitive to the venom. A bite is rarely fatal for a healthy adult, but deaths do occur. There is no antivenom.

What to do:

- Get the animal off as quickly as possible. The longer it bites and chews, the more venom enters the wound. If it is only gripping a fold of skin, it can be held behind the jaws and gently pulled off. If it is holding on firmly, the grip can be loosened by pouring water over the animal or holding it completely under water, or by inserting a thin, flat object between the lower jaw and the skin and twisting it a quarter turn. Do not use fire, heat or solvents on the animal: this only causes more injuries.
- Immediately remove rings, bracelets, watch and piercings before the swelling comes.
- Keep the bitten part of the body still. A light dressing with light pressure can stop the bleeding.
- Call 112, and say that it is a bite from a venomous lizard of the genus *Heloderma*. Never drive yourself; have someone else

drive if you are not collected.
- No tourniquet or constriction, no cutting, no suction, no ice, no heat and no electric shocks.

Treatment in hospital is supportive: blood pressure, pulse and heart rhythm are monitored, fluids and painkillers are given as needed, the wound is cleaned and examined for broken-off teeth, and the tetanus vaccination is updated. Most people can be discharged within a day and are well after about 2 weeks; severe cases require longer admission, and a prolonged bite to a finger can cause lasting damage.

Typical health problems in captivity:

- Obesity: the most common mistake. The tail may be round, but not sausage-thick.
- Problems with shedding when the substrate is too dry, and skin infections when it is constantly wet.
- Metabolic bone disease from too little calcium and UVB.
- Intestinal worms and other parasites, especially in new animals.
- Egg-laying difficulties in females without a suitable place to dig.
- Lack of appetite outside brumation is a sign of illness.

Find a vet with experience of venomous reptiles before one is needed, and agree in advance how the animal will be transported safely. New animals are quarantined.

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.