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GECKOS

Big-scaled dwarf gecko

Sphaerodactylus macrolepis

One of the smallest geckos in the world: a diurnal dwarf gecko from the leaf litter on the islands east of Puerto Rico. Adults measure only 17-28 mm from snout to vent and tolerate neither drought nor heat. *Sphaerodactylus macrolepis* needs an enclosure with a deep, moist leaf-litter substrate and a steady supply of live micro-feeders, and it is therefore a species for the experienced keeper.

Family: Sphaerodactylidae Former name: *Sphaerodactylus imbricatus; Sphaerodactylus danforthi*

KEY FACTS

THE ANIMAL

Adult size	**17-28 mm** snout-vent length
Weight	**0.3 g**
Lifespan	**3-5 years**
Active	**By day and at dusk**
Lifestyle	**Terrestrial**
Habitat	**Dry forest and rainforest**
Difficulty	**Experienced**

CARE

Min. enclosure	**30 × 30 × 30 cm** L × W × H for 2 adults
Temperature, day	**24-27 °C**
Temperature, night	**21-24 °C**
Humidity	**60-80%**
UVB	**Optional**
Diet	**Small invertebrates (springtails, fruit flies)**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**1 eggs**
Incubation	**80-90 days** at 26-28 °C

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Least Concern (LC)**

About the species

Sphaerodactylus macrolepis is a dwarf gecko in the family Sphaerodactylidae. Adults measure 17-28 mm from snout to vent, on average about 24 mm, and weigh only about 0.3 g. Animals from Puerto Rico are larger than animals from the Virgin Islands. The eyes are round and without lids, and the dorsal scales overlap like roof tiles. The name comes from the Greek makros, large, and lepis, scale, and alludes to the relatively large scales.

Male and female look very different. The male has a coloured head, which can be bluish to brownish orange, and a more uniform pattern on the body. The female has a broken pattern on the head and usually a distinct patch on the shoulders with pale eyespots. The sexes are therefore easy to tell apart, and the males grow slightly larger than the females.

S. macrolepis was described in 1859 by Albert Günther from St Croix. For a long time it was regarded as one species with several subspecies. *Sphaerodactylus parvus* was separated as a species in its own right in 2001, and in 2019 most of the remaining subspecies were moved to *Sphaerodactylus grandisquamis*. The species is very numerous in its range: on the Virgin Islands there are about 52,800 animals per hectare, the highest known density for a terrestrial vertebrate.

The species is rare in captivity. The care described below is based on the species' biology in the wild and on the closely related dwarf geckos from Puerto Rico, which were formerly counted as the same species, and is a starting point, not a finished recipe. Lifespan is not known; 3-5 years is an estimate.

Distribution and habitat

Sphaerodactylus macrolepis is native to the islands of the Puerto Rico Bank in the Caribbean. The type locality is St Croix in the US Virgin Islands. The species also occurs on St Thomas and St John, in the British Virgin Islands (including Tortola, Virgin Gorda, Jost Van Dyke, Guana, Great Camanoe and Anegada), on Culebra and Vieques and on several small islands around Puerto Rico. It has also been recorded on Anguilla.

On Puerto Rico itself it is recorded only from a few coastal sites, while the large populations live on Culebra and the Virgin Islands. The delimitation from the related species has changed several times, so older records from Puerto Rico may cover *Sphaerodactylus grandisquamis*.

> **Native range:** Puerto Rico, US Virgin Islands, British Virgin Islands and Anguilla.

HABITAT

Sphaerodactylus macrolepis lives on the ground in the leaf litter in coastal scrub and forest, for example under stands of *Coccoloba uvifera* along the beaches. It is also seen in dense grass and in the leaf litter on the rainforest floor. During the day it stays mostly down in the leaves, where it is coolest and dampest. The leaf layer here is 5-15 cm thick.

At midday it becomes warmer at ground level than the animal likes. The preferred temperature is about 25 °C for males and 26 °C for females, and even the deepest leaf litter is warmer than that between hours 12 and 17.30. Between hours 23 and 8 all microhabitats lie within the preferred range. The relative humidity under the leaves is almost constant at about 98 %, on top of the leaves on average 78 %, and on open sand highly variable. Out in the open the geckos are seen almost only in shade, in overcast weather or early in the morning before the sun arrives.

The body is so small that the animal dries out very quickly, and water loss increases with temperature. This explains why the species keeps to damp and shady places.

Read more: Humidity, misting and ventilation

Care

THE ENCLOSURE

A pair needs an enclosure of at least 30 × 30 × 30 cm (length × width × height). Only one pair may be kept in each enclosure, because both males and females are aggressive towards other adults. Floor area is more important than height, because the gecko lives on the ground. The enclosure must be completely tight in the base and lid, so neither the gecko nor the small feeder insects can escape.

The substrate is the most important part. Put down a 5-10 cm layer of damp coconut fibre or unfertilised soil, preferably mixed with a little sand, and cover it with a layer of leaves of dried oak, beech or almond. Here the animal can retreat into the damp and cool, as in the wild. Add cork bark, flat stones and small climbing plants such as pothos or creeping fig, so there are many hides and different microclimates. A bioactive substrate with springtails and small woodlice keeps the substrate clean and gives the gecko something to eat.

Ventilation should be limited but sufficient. A completely open mesh lid dries the enclosure out too quickly, while a completely closed lid causes mould. A smaller mesh panel in the lid, possibly partly covered, is a good compromise. Young are extra vulnerable to drought and should have a small box of their own with a damp substrate.

Read more: Terrarium construction and bioactive substrate Read more: Feeder animals: keeping and breeding

TEMPERATURE

Sphaerodactylus macrolepis prefers about 25 °C. Keep 24-27 °C by day and 21-24 °C by night, so the temperature falls slightly at night as in the wild. The temperature must not exceed 28 °C for any length of time, and there should be no warm spot. Water loss rises with temperature, and the animal must always be able to get away from the heat. Therefore place the enclosure where the sun never reaches it, and measure the temperature with a digital thermometer down in the substrate and not only in the air.

In most homes heating is unnecessary in summer. In winter a weak heat mat at the side, controlled by a thermostat, may be enough. Never heat the whole floor, because then the damp layer the animal seeks down into dries out. Animals that remain in view during the warmest hours of the day are a sign that it is too dry or too warm.

Read more: Heat and temperature

HUMIDITY AND WATER

The humidity should be 60-80 %, and down in the leaf litter the substrate must be moist all the time, so that there is a place in the enclosure where the humidity approaches 100 %, like under the leaves in the wild. Spray lightly every day or every second day, preferably in the evening or morning, so that leaves and bark are dewy and the moisture holds in the leaf litter. Never leave the substrate wet without air exchange, because then mould appears.

The gecko drinks droplets from leaves and decoration and does not need a water bowl. A deep bowl is a drowning trap for so small an animal; if you want a water source, use a very shallow bowl filled with small pebbles. A hygrometer down in the leaf litter shows whether the humidity holds.

LIGHTING AND UVB

The species is regarded as diurnal but stays in shade and in the leaf litter and is seen mostly early and late in the day. Use a weak light that does not heat, for example LED or a fluorescent tube, and keep it on for about 12 hours in summer and 10-11 hours in winter. Avoid spotlights, because they heat and dry out the enclosure. The night must be dark.

The species has no known need for UVB and stays mostly in shade. A very weak UVB tube over one end is optional. If so, provide plenty of shade and hides so that the animal can avoid the light.

Read more: Lighting and UVB

FEEDING

In the wild the gecko lives mostly on small arthropods such as springtails, and it also takes fruit flies, both larvae and adults. This fits its size: the feeder animal must be smaller than the animal's head. For adults, springtails, small fruit flies (*Drosophila melanogaster*), small woodlice and newly hatched crickets are suitable, and for young especially springtails and the smallest fruit flies.

So small an animal has no large reserves, so offer food daily or every second day, and make sure there are springtails in the substrate all the time. A bioactive substrate with a population of springtails solves a large part of the task. Dust the fruit flies lightly with calcium and vitamin D3, and use vitamin powder sparingly. Watch the animal: a plump, round tail and active behaviour show that it is eating enough.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

The gecko is fast, shy and very small, and it must not be handled. It can escape through even small openings, and even a light touch can injure it. Keep the enclosure closed and sealed, and work calmly with the substrate. The animal spends much time hidden in the leaf litter, so it can be hard to spot, but this is normal.

In the wild it defends itself against fire ants by twisting and lashing with its legs and tail, and it can vanish down into the leaves in a moment. Both males and females are aggressive towards other adults, so keep one pair or one animal per enclosure, and never put two males together. Watch for animals that hide all the time or stop eating, because this can be a sign of stress.

Breeding

SEXUAL MATURITY AND SEXING

The sexes are easy to recognise by colour. The male has a coloured head, which can be bluish to brownish orange, and no distinct pattern on the throat. The female has a striped or broken head pattern and a marked shoulder patch with pale eyespots. The males grow slightly larger than the females. Age at sexual maturity is not known, so wait until they are fully grown before putting them together for breeding.

MATING

The species is rare in the hobby, and there is no known seasonal rhythm or winter rest in breeding. In the related species from Puerto Rico breeding is easy: a well-fed pair in an enclosure with many hides breeds without special help, and the light is simply shortened slightly in winter. Make sure the female is not being chased.

EGG-LAYING AND CLUTCHES

The female lays only one egg at a time but repeats this several times a year, as is typical of the genus. The egg is small, white and hard-shelled. In the related species from Puerto Rico a well-fed female lays an egg every 20-30 days. They readily lay the eggs in hollow plant stems, for example dried stems of Japanese knotweed, so it is a good idea to stand some upright. Also look in the leaf litter and under bark and stones.

In the related species the adults do not hunt the young, so the eggs can be left in the enclosure. Move them only if necessary.

INCUBATION

The eggs probably hatch after 80-90 days at 26-28 °C; the figures are borrowed from *Sphaerodactylus elegans* and *Sphaerodactylus torrei*. If the egg has to be moved, keep it in the same orientation and place it in a small box with moist vermiculite or coconut fibre. The air in the box must be humid so that the egg does not dry out. Newly hatched animals are particularly vulnerable to desiccation, and in the wild it is thought to help when hatching falls in a cooler and damper period.

REARING THE YOUNG

The newly hatched animals are extremely small and dry out easily. Place them in a small, secure box of about 1 litre with a moist substrate of coconut fibre or sphagnum and leaves, and spray daily. The first food is springtails and the very smallest fruit flies, which must be available all the time. Keep the young separate from the adults. In the related species the young can be reared in small groups, but divide the animals if unrest arises.

Health and common mistakes

Most problems are caused by incorrect conditions, and the typical mistakes are:

- An enclosure that is too dry. The body is so small that the animal dries out quickly. Lethargy, sunken eyes and wrinkled skin are signs of dehydration.
- Too hot. Water loss increases with temperature, and heat above 27-28 °C is risky. Never place the enclosure in sun.
- Poor ventilation and a stagnant wet substrate, which cause mould and skin problems.
- Wrong food: feeder animals that are too large or only one kind. Give varied small food.
- Weakened animals after long transport. Newly purchased animals can be dehydrated and must go straight into a damp enclosure.

The animal is too small to treat yourself. Contact a vet with experience in reptiles if the gecko loses weight, sits lethargically in the open all day or does not eat.

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.