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GECKOS

Smooth knob-tailed gecko

Nephrurus levis

Nephrurus levis is a plump, nocturnal desert gecko from inland Australia with a huge head, large eyes and a short tail ending in a small knob. It digs its own burrows in the sand, is placid, and does well in a sand-based enclosure with a warm end and a humid hide.

Family: Carphodactylidae Former name: *Nephrurus laevis; Nephrurus platyurus*

KEY FACTS

THE ANIMAL

Adult size	**9-12 cm** snout-vent length
Lifespan	**10-15 years**
Active	**At night**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Desert and semi-desert**
Difficulty	**Intermediate**

CARE

Min. enclosure	**50 × 30 × 30 cm** L × W × H for 1 adult
Temperature, day	**21-25 °C**
Basking spot	**30-32 °C**
Temperature, night	**16-20 °C**
Humidity	**30-50%**
UVB	**Optional**
Diet	**Insects**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**24-36 months**
Clutch size	**1-2 eggs**
Clutches per year	**6-9**
Incubation	**65-80 days** at 27-29 °C

PROTECTION AND PAPERWORK

CITES	**Appendix III**
EU annex	**Annex C**
IUCN	**Least Concern (LC)**

About the species

Nephrurus levis belongs to the knob-tailed geckos, a small genus of Australian ground-dwelling geckos whose short tail ends in a small, round knob. What the knob is used for is not known for certain. This species has smoother skin than its spiny relatives such as *Nephrurus asper*, and that is also what the species name *levis*, "smooth", alludes to. The head is large and broad, the eyes big and dark and the body short and stout, which gives the animal an almost comical expression.

The base colour ranges from pinkish grey to purplish or yellowish brown, with light and dark tubercles and blotches that often form crossbands over the back and tail. Many animals have a few narrow, pale crosslines. Juveniles are usually more boldly marked than adults.

The species was described by De Vis in 1886. Three subspecies are recognised: *N. l. levis* over most of the range, *N. l. occidentalis* on the central coast of Western Australia and *N. l. pilbarensis* in the Pilbara.

Adults reach about 9-12 cm from snout to vent, and females are slightly larger than males. The original tail is only about 2 cm long. If an animal loses it, a new one grows back, but it is often rounder and without the distinct knob. Few reliable weight figures exist, so weight is not given in the fact box.

In the enclosure the species is calm and easy to deal with, as long as it is allowed to dig. It tolerates handling better than many other desert geckos, but it is mostly an animal to watch. With good care it lives for 10-15 years.

Distribution and habitat

The species is found only in Australia, where it lives in the arid and semi-arid interior of New South Wales, the Northern Territory, Queensland, South Australia and Western Australia. It is common in South Australia and reaches north to the area around Tennant Creek, east to Bourke in New South Wales, west of the Great Dividing Range, and west to the coast of Western Australia.

It is absent from Victoria, from the humid regions along the south and east coasts, from the tropical north and from the south-western corner of Western Australia. The subspecies *pilbarensis* is known from the Pilbara and *occidentalis* from the coastal areas around Shark Bay and Narryer.

> **Native range:** Australia.

HABITAT

The gecko lives in open, dry country: sandplains, dunes, spinifex desert, dry scrub and open woodland with acacia and eucalyptus. What these places have in common is loose, well-drained soil that it can dig in.

During the day it lies in a burrow underground or under a rock or a log, where it is cooler and more humid than at the surface. After sunset it comes out and hunts spiders, grasshoppers, beetles, cockroaches, scorpions, centipedes and even smaller geckos.

The days are hot, and the difference between day and night is large. In winter the nights are cold, and the animals lie still in their burrows. The cool season triggers breeding, so the females begin to lay eggs when spring arrives, and this is what is imitated in the enclosure.

Care

THE ENCLOSURE

An adult can be kept in an enclosure of at least 50 × 30 × 30 cm (length × width × height), but bigger is better, and floor area matters more than height. The species is best kept singly, because several animals together may fight. Plastic boxes in racks are also an option, and juveniles do well in small boxes of about 35 × 20 × 10 cm.

The substrate is the most important thing. Use fine sand, preferably mixed with a little clay or slightly damp soil, in a layer 10-12 cm deep, so that the gecko can dig burrows that do not collapse. Give it one or two dark hides with a single entrance, for example an upturned saucer or a cork hollow, and place the hides directly on the floor of the enclosure. Keep the sand under and inside one of the hides damp, so that there is always a humid zone. The decor can be simple: a couple of flat stones and a few roots are plenty, and plants are unnecessary.

TEMPERATURE

The species needs a clear difference between a warm end and a cool end. Place a heat mat under one end, or use a low-output ceramic heater, so that the surface there reaches 30-32 °C. Keep the cool end at 21-25 °C. At night the whole enclosure may drop to 16-20 °C, and the heat can be switched off. Always control the heat source with a thermostat, and measure with a thermometer at both ends.

In winter, breeding animals typically get 8-10 weeks of lower temperatures, shorter days and less food. This requires a healthy, well-nourished animal, and if you are in doubt, keep the winter mild.

Read more: Heat and temperature

HUMIDITY AND WATER

Although the species comes from dry regions, it cannot do without moisture, because the burrows underground are more humid than the air above. Humidity in the enclosure can sit at 30-50 %, but the sand under one hide must always be damp. Moisten it from below or pour in a little water two to three times a week. Too little moisture causes problems with shedding and, in the worst case, dehydration.

Place a shallow dish of fresh water in the cool end, and change it daily. Keep the rest of the substrate dry, because wet sand at the surface goes mouldy, and damp in the warmth is unhealthy. Push a finger into the sand by the hide to check that it is still damp.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

The species is nocturnal and does not need bright light, and powerful spotlights stress it. Usually only heat is provided, and the daylight in the room sets the daily rhythm. There are no firm guidelines for UVB for this species, so it is optional.

If you want to provide UVB, choose a low-output tube and make sure the gecko can lie in shade in its hide all day. The light can be on for 10-12 hours a day in summer and must be off at night. Good hides matter far more than the lighting.

Read more: Lighting and UVB

FEEDING

The gecko lives on insects and is not fussy. Offer crickets, dubia roaches and small locusts, and now and then waxworms or mealworms for variety. A meal is typically 4-5 insects smaller than the animal's head. Adults are fed 3-5 times a week, juveniles every day or every other day.

Dust the insects lightly with calcium, and give a vitamin and mineral supplement with vitamin D3 a couple of times a week. Egg-laying females need extra calcium. Gut-load the insects with vegetables and insect feed for a day or two before they go into the enclosure, and remove any that are not eaten. The gecko stores fat in its short, thick tail, and a thin tail is a sign that something is wrong.

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

BEHAVIOUR AND HANDLING

The gecko is calm and placid, but shy when new. It becomes active after dark and spends most of the day in its hide. Many animals get used to handling, and the species tolerates it better than many other desert geckos, but it does not become as tame as *Eublepharis macularius*.

Handle it briefly and low over the floor on a flat hand, and do not disturb it during the day, when it is resting. Never grab the tail. Keep the animals separately, and put a male and a female together only for mating. A male can be kept with two or three females, but this requires a large enclosure and close supervision. Stress shows as the animal stopping eating or digging restlessly back and forth.

Breeding

SEXUAL MATURITY AND SEXING

Males can be recognised by a distinct bulge at the base of the tail, where the hemipenal pouches sit, and by a row of pores just in front of the vent. Females are slightly larger and have a smooth tail base. The sex can usually be seen when the animals are a couple of months old.

The species breeds readily when it is 2-3 years old, and it is best to wait until then. Breeding earlier is not recommended, because young females are drained of calcium and may have a shorter life. The female must be fully grown and in good condition before she is put to breed.

MATING

Breeding follows the seasons, and a cool winter is important. Give the animals 8-10 weeks of lower temperatures, shorter days and less food. When it gets warmer again, the females begin to lay eggs. In Australia, egg-laying begins around September and continues throughout the summer.

Introduce the male to the female in her enclosure in the evening, and keep an eye on them. If the female is unwilling, or the male is too rough, separate them at once. The female can store sperm and lay several clutches after a single mating, so the male can be removed again after a few days.

EGG-LAYING AND CLUTCHES

The female usually lays two eggs at a time, more rarely one. Clutches come about four weeks apart, and there may be 6-9 clutches in a season. The eggs are white and leathery and dry out easily.

The female buries the eggs in damp sand, often under the humid hide, so check for them regularly. Give her plenty of insects dusted with calcium throughout the season. If she loses weight, or the tail becomes thin, breeding must be stopped so that she can recover.

INCUBATION

As soon as you find the eggs, move them to a small box of damp vermiculite or perlite without turning them. Lay them partly into the substrate, and close the box with a couple of small ventilation holes. Use an incubator that can hold the temperature steady at 27-29 °C.

At 28-29 °C the eggs hatch after 65-80 days, and at lower temperatures it takes longer. At 27 °C roughly equal numbers of males and females hatch, but it has not been thoroughly investigated whether temperature determines sex. There are no firm figures for humidity, so keep the substrate slightly damp and check that the eggs do not collapse.

Read more: Incubating eggs

REARING THE YOUNG

The hatchlings shed within the first day and begin to eat after four to five days. Give them small crickets and roaches dusted with calcium every day or every other day.

Keep them singly in small boxes with 5-8 cm of sand, a small hide, a damp corner and a shallow water dish at the same temperature as the adults. The young are fully grown after about two years. Little growth data exists, so weigh them regularly.

Health and common mistakes

The species is hardy when it has sand to dig in and a humid hide, and most problems are caused by husbandry. The typical mistakes are:

- Too little moisture, so that shedding goes badly and remnants stick to the toes and tail. In the worst case the animal dries out. Provide a humid hide all year round.
- Too little calcium and vitamin D3, especially in young animals and egg-laying females. This causes soft bones and tremors.
- Obesity, if the animal is given too much food. A very thick tail is a sign of this.
- Egg-laying difficulties (dystocia) in females in poor condition. See a vet if she is visibly distended and cannot lay.
- Sand swallowed along with prey. Feed on a flat stone or in a shallow dish.
- Stress from too many animals together or too much handling.

A healthy animal has clear eyes, a plump tail and a sturdy body. See a vet with reptile experience if the gecko loses weight, does not eat for several weeks, seems limp or cannot shed.

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.