herpy

IGUANAS

Regal horned lizard

Phrynosoma solare

Phrynosoma solare is a large, flat horned lizard from the deserts of southern Arizona, New Mexico and north-western Mexico. The female grows to 12 cm from snout to vent and has a crown of four large horns at the back of the head. The species is diurnal and feeds almost entirely on ants, and it is precisely this diet that makes it one of the most difficult lizards to keep in a vivarium.

Family: Phrynosomatidae Former name: *Phrynosoma regale; Phrynosoma solaris*

KEY FACTS

THE ANIMAL

Adult size	**10-12 cm** snout-vent length
Lifespan	**7-9 years**
Active	**By day**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Desert and semi-desert**
Difficulty	**Expert**

CARE

Min. enclosure	**100 × 50 × 40 cm** L × W × H for 1 adult
Temperature, day	**27-30 °C**
Basking spot	**38-42 °C**
Temperature, night	**18-22 °C**
Humidity	**20-40%**
Water	**No water dish**
UVB	**Essential** Ferguson zone 3
Diet	**Insects**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Clutch size	**7-33 eggs**
Clutches per year	**1**
Incubation	**40-61 days** at 27-30 °C

PROTECTION AND PAPERWORK

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

About the species

Phrynosoma solare is a short, broad, almost flat lizard with a crown of large horns at the back of the head. The scientific species name comes from Latin and means "belonging to the sun". Four horns of equal size stand in a row in the middle of the back of the head, with their bases touching. This distinguishes the species from the other horned lizards of Arizona. The horns merge with the large, pointed scales on the sides of the head. A fringe of pointed scales runs along each side of the body, the back carries scattered pointed scales, and the forelimbs have large, keeled scales. The tail is short.

The colour matches the ground: reddish brown, light brown or grey, often with dark, soft blotches on the neck. The middle of the back is usually paler than the flanks, and some animals have a faint, pale stripe along the back. The underside is pale with small, dark spots.

The female grows to 12 cm from snout to vent, the male to about 10 cm. Weight is not documented.

The species defends itself first and foremost by lying still and blending into the ground. If discovered, it can inflate its body by swallowing air and jab with its horns. If threatened or caught, it can squirt a jet of blood from pores in the lower eyelids, over 1 m, and repeat this several times. This is a last resort when camouflage and threat displays fail.

P. solare is one of the most specialised ant-eaters among the horned lizards: about 89% of its diet is ants, especially harvester ants, and a single meal can amount to as many as 2,500 ants. The rest is beetles, other insects and spiders. Ants are low in nutrients, and the diet cannot be fully replaced in a vivarium. This is the main reason why the species is so difficult to keep.

Distribution and habitat

Phrynosoma solare lives in south-western North America. In the USA it occurs in southern and south-eastern Arizona and in south-western New Mexico. In Mexico it occurs across most of Sonora, including Tiburón Island, and in northern Sinaloa. The type locality was given as California, but this is an error and has since been corrected to Yuma in Arizona.

In Arizona the species occurs from about 275 to 1,370 m above sea level.

> **Native range:** United States and Mexico.

HABITAT

Phrynosoma solare lives in desert scrub and grassland with scattered shrubs, such as mesquite, creosote bush and saguaro, and in valleys, stony slopes and low foothills in the Sonoran Desert and the Chihuahuan Desert. It is found mostly on level or gently sloping ground with open, sunlit patches between bush and scrub. The climate is hot and dry.

The species is diurnal and lives on the ground. It is most active from April to September, especially in the morning, and burrows into the soil or retreats into a hole when it gets too hot or too cold. It often basks with only its head sticking up out of the sand. It stays above ground until the temperature rises above about 52 °C. The female digs a nest in loose soil: a chamber at the end of a sloping tunnel about 35 cm long.

In winter the species is largely inactive, but it can be seen on unusually warm days. It may enter hibernation from late September or October. The temperature and duration are not documented.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Little is known about the care of *Phrynosoma solare*. Its care is therefore based on its habitat: open, dry terrain with loose soil, strong sun and a diet of ants. The figures are borrowed from *Phrynosoma cornutum* and *Phrynosoma platyrhinos*, which are better known in captivity but are also among the most difficult lizards to keep. The lifespan in the box, 7-9 years, is also borrowed from *P. cornutum*. *Sceloporus undulatus* and *Sceloporus occidentalis* from the same family are far easier to keep, because they eat ordinary feeder insects.

An adult needs a vivarium of at least 100 × 50 × 40 cm (length × width × height). The species does not climb, so floor area is what matters. The substrate should be 8-10 cm of a loose mixture of fine sand and soil, so the lizard can bury itself completely. Furnish the vivarium openly and simply: flat stones and a few pieces of wood as basking spots and lookouts, and a couple of hides. Secure the stones so they do not shift when the animal digs. The vivarium needs a tight-fitting lid and good ventilation. Place it somewhere quiet, as the species is stressed by disturbance.

TEMPERATURE

The species is a sun-lover and needs a basking spot where the surface reaches 38-42 °C, measured with an infrared thermometer. The rest of the vivarium should be cooler, 27-30 °C during the day, so the lizard can choose for itself how long to lie in the heat. The heat lamp must be controlled by a thermostat, and the animal must not be able to touch the bulb.

At night the temperature drops to 18-22 °C. No heating is needed at night as long as the room stays at 18 °C or above. The figures are borrowed from *P. cornutum* and *P. platyrhinos*.

Both too little and too much heat are harmful. If it is too cold, the lizard digests poorly. If the whole vivarium is too hot, it buries itself and does not come out.

Hibernation in a vivarium is not documented. Do not give a winter rest without advice from a vet with reptile experience.

Read more: Heat and temperature

HUMIDITY AND WATER

Humidity should be low, 20-40%, and the vivarium should dry out completely during the day. The substrate must not be wet.

The species hardly ever drinks from a bowl, but licks droplets from stones and plants. Mist lightly once or twice a day, so that droplets form, and let it dry off again.

Read more: Humidity, misting and ventilation

LIGHTING AND UVB

The species is diurnal and spends the day in open sunlight, so it needs strong light and UVB all year round. Use a UVB tube (Ferguson zone 3, T5 HO 10-14%) or a combined UVB metal halide lamp over the basking spot. The zone is set on the basis of the habitat. Measure the UV index at the height of the animal's back, and replace the light source according to the manufacturer's instructions.

Keep the lights on for about 12 hours a day, preferably 14 hours in summer and 10 hours in winter, controlled by a timer. There must be a cooler, shadier place to retreat to. It must be dark at night.

Read more: Lighting and UVB

FEEDING

Diet is the decisive limitation. In the wild, about 89% of the diet is ants, especially harvester ants, and the species eats large quantities. The rest is beetles, other insects and spiders. The diet cannot be fully reproduced in a vivarium, and there is no documented diet that keeps the species healthy over time.

In a vivarium, feed fruit flies, small crickets and small mealworms, dusted with a calcium supplement for ant-eaters, once a day. Offer as many different small feeder insects as possible, and offer live ants when they can be obtained. Wild-caught ants can carry intestinal worms, and they must only be collected from pesticide-free places.

Gut-load the feeder insects with nutritious food for a day before feeding them. Weigh the animal regularly: an animal that is losing weight is not getting enough of the right food.

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

BEHAVIOUR AND HANDLING

Phrynosoma solare is calm and lives alone. It does not make much of itself and is easy to overlook, because it blends into the ground. It is slow and moves in short stretches. Males signal with head-bobs and push-ups.

The species is not an animal for handling. It is easily stressed, and an animal that is picked up may jab with its horns or squirt blood from its eyes. This is a defensive reaction and not a sign of illness, but it is a sign of severe stress. Let new animals settle in peace, and handle them only when necessary. Keep one animal per vivarium.

Breeding

SEXUAL MATURITY AND SEXING

The young are unlikely to become sexually mature in their first year. *Phrynosoma solare* is a young adult by the end of its second summer and probably fully grown after three years. The female is larger than the male, and the male's hemipenes swell in early summer, but no other reliable sex characteristics are documented. Use only fully grown animals in good condition for breeding, and keep an eye on the female's weight when she is carrying eggs.

MATING

Mating in a vivarium is not documented. The species is egg-laying. In the wild, mating takes place from late April to June, peaking in June, and the male nods his head and performs push-ups for the female. In *P. cornutum* the male lies on top of the female for a couple of hours, and the female rejects other males afterwards. Remove the male after mating. How mating is triggered in a vivarium is not documented.

EGG-LAYING AND CLUTCHES

The female lays one clutch a year, mostly in late July and early August, of 7-33 eggs, typically about 15. She digs a sloping tunnel with a chamber at the end in loose, slightly moist soil. For egg-laying the female needs a box or a corner with at least 25 cm of deep, slightly moist sandy soil. The depth is borrowed from *P. cornutum*. Without a suitable place the female may retain her eggs, and this can become life-threatening.

INCUBATION

Incubation time and temperature are not documented for the species. The box's 40-61 days are borrowed from *P. cornutum*, and 27-30 °C is borrowed from *P. platyrhinos*. The eggs are incubated in slightly moist vermiculite and moved carefully without being turned. Keep the moisture even, so the eggs neither dry out nor become wet.

Read more: Incubating eggs

REARING THE YOUNG

Rearing the species is not documented. The young are independent and bury themselves in the sand as soon as they have hatched. In *P. cornutum* the young are small and shy and eat only small ants, and rearing is the most difficult stage. They must be fed daily with fruit flies and small crickets, dusted with calcium, and given peace and plenty of hides.

Health and common mistakes

Most illnesses are caused by mistakes in diet or in the set-up. The typical problems are:

- Emaciation and starvation. If the diet is not right, the lizard slowly loses weight and dies. This is the most common cause of loss, especially in wild-caught animals.
- Calcium deficiency and brittle bones (metabolic bone disease) from too little UVB and calcium. This causes soft jaws, bowed legs and tremors.
- Stress from too few hides, too little peace or several animals together.
- Intestinal worms and mites, especially in wild-caught animals. Have a faecal sample examined, and check the skin.
- Shedding problems in air that is too dry.
- Burns from unguarded heat lamps.

A healthy animal is alert and has a plump body. Weigh the animal regularly, because sudden weight loss is often the first sign of illness. Consult a vet with reptile experience if the animal loses weight, does not eat, is lethargic or has swellings on the jaw.

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.