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CHAMELEONS

Panther Chameleon

Furcifer pardalis

Furcifer pardalis is a large, brightly coloured chameleon from the northern and eastern coastal lowlands of Madagascar. The males' colours vary with origin and are among the most striking of any lizard, while the females are more subdued in orange, brown and pink. The species breeds readily, but requires a tall enclosure, UVB, high humidity at night and a life alone. Females live briefly, up to 3 years.

Family: Chamaeleonidae Former name: *Chamaeleo pardalis; Chamaeleo ater; Chamaeleo guentheri*

KEY FACTS

THE ANIMAL

Adult size	**30-51 cm** total length incl. tail
Lifespan	**2-6 years**
Active	**By day**
Lifestyle	**Arboreal**
Habitat	**Dry forest and rainforest**
Difficulty	**Intermediate**

CARE

Min. enclosure	**60 × 60 × 120 cm** L × W × H for 1 adult
Temperature, day	**22-25 °C**
Basking spot	**29-32 °C**
Temperature, night	**15-21 °C**
Humidity	**50-100%**
Water	**No water dish**
UVB	**Essential** Ferguson zone 4
Diet	**Insects**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**6-8 months**
Clutch size	**10-46 eggs**
Incubation	**180-365 days** at 22 °C

PROTECTION AND PAPERWORK

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

About the species

Furcifer pardalis is a large chameleon with a powerful body, a long, coiled tail and a tongue that can be longer than the body. Males reach 40-51 cm including tail and are clearly larger and heavier than females. In the wild, females average 9 cm from snout to vent against the males' 14 cm, and they weigh about 23 g against the males' 61 g. The genus name *Furcifer* comes from the Latin for fork and refers to the cleft feet. The species name *pardalis* is Latin for leopard and refers to the pattern.

The colours are the species' hallmark. Males occur in blue, green, red, orange and yellow shades with spots, bands and stripes, and the pattern is tied to origin, so animals from the same area resemble one another. Animals from the areas around Nosy Be, Ankify and Ambanja are typically bright blue, animals from Ambilobe, Antsiranana and Sambava are red, green or orange, and animals from Maroantsetra and Toamasina are mostly red. In the trade, the local names are used to designate the colour forms. Females are almost always orange to brown with a touch of pink, wherever they come from. A gravid female turns black with orange stripes. Males can also be recognised by a swollen tail base, where the hemipenes lie.

The species was described in 1829 by Georges Cuvier. Genetic studies have found 9-15 distinct lineages, which may be separate species, but it is still regarded as one species. The feet are tong-shaped, with two and three fused toes, which give a strong grip on thin branches.

It is hardy compared with many other chameleons, but is still a demanding species that reacts to poor humidity, wrong lighting and stress. Males are territorial and display with colours, an inflated body and head-bobbing. Females are more reserved. The species suits being kept as a display animal and not as an animal that is handled daily.

Read more: Humidity, misting and ventilation

Distribution and habitat

Furcifer pardalis is native to Madagascar, where it is widespread in the lowlands along the eastern and north-eastern coasts and on the north-western coast and nearby islands, including Nosy Be, Nosy Komba, Nosy Mitsio, Nosy Sakatia, Nosy Mangabe and Sainte-Marie. It is most numerous in the northern and eastern coastal areas.

The species has been introduced to Réunion and Mauritius and is also found in Florida, where animals from the trade have become established. The map shows only the original range.

> **Native range:** Madagascar.

HABITAT

The species lives in the lowlands, in humid forest in the east and in drier deciduous forest in the north-west. It prefers open, sunny places to deep shade, probably because it needs to be able to bask and because males use open spaces to display to females and mark territory. It thrives in disturbed habitat and is by far commonest in the belts of trees and bushes along roads and watercourses, while it is rare inside closed forest. The animal lives in trees and bushes and rarely comes down to the ground.

The climate is warm and humid: on Nosy Be about 2,250 mm of rain falls per year, and the mean temperature is 26 °C. The animals bask in the morning and actively seek UVB. The breeding season typically lies between January and May, and females lay several clutches. Few animals survive longer than a year in the wild.

Read more: Lighting and UVB

Care

THE ENCLOSURE

An adult needs an enclosure of at least 60 × 60 × 120 cm (length × width × height). This is a minimum, which makes it possible to create a temperature gradient and climbing opportunities above one another. Males grow large and need more width, and 90 × 60 × 120 cm is a better size. Larger is always better. Only one chameleon should live in each enclosure, including males and females, siblings or two females. No form of keeping several animals together is good for them.

The species has managed in mesh enclosures for decades, but an ordinary living room rarely provides 50 % humidity by day and 80-100 % at night when all sides are mesh. Therefore cover two or more sides of a mesh enclosure with plastic, or use a hybrid enclosure with solid sides and mesh on top. If the climate in the room is dry, an enclosure of glass or panels may be better. Keep the air moving so that it does not become stagnant.

Furnish the enclosure with an open basking area at the top and a dense, leafy zone where the animal can hide. Place the basking branch above eye level so the animal can look down. Use branches of different thicknesses, vines and non-toxic plants, for example pothos, ficus, hibiscus and umbrella plant. No substrate is necessary. A drain in the bottom with a bucket underneath is the simplest way to handle the large volumes of water that enter the enclosure every day. Secure branches and vines with cable ties through the mesh.

Read more: Heat and temperature

TEMPERATURE

The daytime temperature is 22-25 °C, and at night it falls to 15-21 °C. Cold nights down towards 15 °C are unproblematic if the animal can warm up in the morning. The basking branch should have a surface temperature of 29-32 °C. Start at the low end, and follow the animal's behaviour. One or two low-wattage heat bulbs shining down on a branch are enough. Two bulbs

side by side heat more evenly.

The animals can burn themselves without noticing. Hang a more powerful bulb higher above the enclosure, so that the heat is gentle and covers a larger area. Hold your hand where the animal's head will sit: the heat should feel comfortable. If the animal hangs under the lamp for more than an hour or two, sits right up in the mesh or remains dark and sluggish, the basking spot is too cold. Grey, burnt patches and melted dorsal spines are signs of the opposite. Measure with an infrared thermometer.

Switch the heat lamp off about four hours before the other lights go off in the evening. Heat is highest at the top and lowest at the bottom, and there must be branches and foliage at all heights.

HUMIDITY AND WATER

Humidity should alternate over the course of the day: about 50-60 % by day and 75-100 % at night. The figures are not critical, but the rhythm is important. The chameleon does not drink from a bowl, but from droplets. Provide water as rain and dew: mist the enclosure morning and evening, preferably when it is dark, and use a drip, for example a bucket with a small hole, running for a few hours in the afternoon. A fogger can be used for a few hours before the light comes on in the morning if the enclosure is sealed enough. Keep the air moving.

All surfaces must be dry during the day. If branches and leaves are constantly wet, the animal develops sores on its feet, and bacteria, fungus and mould thrive. Use distilled water for foggers and humidifiers so that the equipment does not clog. Do not mist more to help during shedding, because it can make the shed harder.

LIGHTING AND UVB

The species is diurnal and needs strong light. Fit a long T5 HO tube or an LED bar of 6,500 K over the whole length of the enclosure, on for 12 hours a day and off completely at night. Provide no light at night.

UVB is necessary. In the wild the species lives in Ferguson zone 4, the highest UV zone for reptiles, and it basks actively to produce D3. Provide a gradient with a UV index of about 3 at the basking branch and at most 6-8 right up under the mesh. Use a T5 HO tube of 5-6 % in a reflector, and raise the fitting 5-8 cm above the mesh: chameleons climb on the mesh, and the first centimetres under a tube lying directly on the mesh give too much UVB. Place the basking branch so that the animal's back is about 15 cm below the mesh. This is a rule of thumb: check with a UV meter, because the index falls with the age of the tube. Replace the tube according to the manufacturer's instructions.

The female's vitamin D status matters greatly for the eggs. The female passes D3 on to the eggs, and eggs from a female with too little UVB hatch poorly or not at all. The closer the UVB level is to the natural one, the more eggs hatch.

Read more: Calcium, vitamins and supplements

FEEDING

Furcifer pardalis is an insectivore. Offer a varied diet of dubia roaches, banana roaches, crickets, grasshoppers, silkworms, hornworms, black soldier flies and their larvae, bluebottles, stick insects and newly hatched mantises. Variety is the key. Plant matter is only rarely eaten.

Young animals get as much as they can eat, every day. When an animal no longer grows in length, but only in girth, it is adult and gets 3-5 insects every other day. Females easily become too fat and lay too many eggs, and therefore the amount must be kept down.

Dust the insects lightly at each meal with calcium without D3. Twice a month they are dusted with a multivitamin with retinol (preformed vitamin A) and a little D3. Beta-carotene is not a substitute, because it does not appear to work in this species. Give the insects a nutritious diet 24-48 hours before feeding, and use captive-bred insects.

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

BEHAVIOUR AND HANDLING

F. pardalis is a territorial species that lives alone except for mating. Males that meet change colour, inflate the body and bob, and losers turn dull and dark. This can lead to fights. For that reason only one chameleon should live in each enclosure.

The species can be tamed with patience, but it is not an animal to be picked up daily. Give a new animal 1-2 weeks in peace. If it has not eaten after two weeks, go to a vet with reptile experience. Offer food with tweezers, and let the animal come to the hand when it takes food. Use an artificial branch in front of the open door so the animal can climb out. Never grab the

animal. Keep movements slow, let it walk from hand to hand, and associate handling with something positive, such as a trip to a plant in a sunny window.

Dark, rapidly changing colours, gaping and attempts to flee are signs of stress.

Breeding

SEXUAL MATURITY AND SEXING

Males are larger, more strongly coloured and have a swollen tail base, where the hemipenes lie. Females are smaller, more uniformly orange to brown or pink and have a thinner tail base. In young animals under six months the sex is hard to see, because they are small, dull in colour and without a bulge at the tail.

Sexual maturity is reached at 6-8 months. The animals then also reach adult colour and size. Females' lives are short, up to 3 years, and egg laying is hard on the body. A female typically lays 5-8 clutches over her lifetime.

MATING

Mating begins with the male displaying with colours and head-bobbing, and the female showing whether she is receptive. A receptive female allows the male to climb onto her. A female that does not want to mate gapes, hisses and bites. A gravid female turns black with orange stripes and is strongly rejecting.

Put the animals together under supervision, and separate them when the female rejects the male. In the wild the breeding season is January to May. Females can lay several clutches a year.

EGG-LAYING AND CLUTCHES

Gestation lasts 3-6 weeks. The female digs a tunnel with her forelegs, backs in and lays the eggs. A clutch is 10-46 eggs, and the number depends on the female's food and nutrition.

Provide the female with a tray or a pot of moist soil that can hold a tunnel. The container should be at most about 15 cm deep. The female looks for a hard layer underneath to lay against, and if she does not find it, she keeps digging and exhausts herself, and the tunnel may collapse. She fills the hole again and tamps the soil firm, and some females pull leaves and twigs over the spot.

INCUBATION

The eggs can be left where they were laid or moved to incubation equipment. The incubation period is long, 6-12 months. At 22 °C the eggs hatch after 7-9 months, on average after about 240 days. Many temperatures and methods work, but the best incubation temperature has not been established. The eggs should lie in a moist substrate, as with other chameleon eggs.

Eggs from a female that has had too little UVB hatch poorly or not at all. Newly hatched young weigh 0.25-0.75 g and are independent from the first day, and they use their egg tooth to cut a star-shaped opening in the shell.

Read more: Incubating eggs

REARING THE YOUNG

The young are independent from hatching and can be put in a tall enclosure with many plants and branches. They need UVB and the same humidity conditions as the adults. Offer small insects every day, as much as they can eat, and dust them with calcium. The young are sexually mature after about six months, and the animals must live separately when they approach that.

Health and common mistakes

Most illnesses are caused by errors in the setup, especially too little UVB, wrong supplementation and too much food. The typical problems are:

- Metabolic bone disease (MBD) from too little UVB, calcium and D3. Provide UVB, dusted insects and the right supplements.
- Vitamin A deficiency and toxicity. The supplement should contain retinol, not only beta-carotene.
- Obesity and egg-laying difficulties (dystocia) in females, which can be life-threatening. This is caused by overfeeding and too many eggs. Requires a vet.
- Respiratory infections from wrong humidity or stagnant air.

- Burns from lamps that are too close. The animals do not feel it themselves.
- Sores on the feet and mould when branches and leaves are wet all day.
- Internal parasites.

A healthy animal has open, clear eyes, a robust body, grips the branch firmly and eats regularly. Reptiles hide illness, so seek a vet with reptile experience if the animal does not eat, loses weight, sits dark and listless or breathes with its mouth open. An annual health check is recommended.

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.