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CHAMELEONS

Four-horned Chameleon

Trioceros quadricornis

Trioceros quadricornis is a medium-sized chameleon from the cool mountain forests of Cameroon and south-eastern Nigeria. The male carries several horns on the snout and a tall sail-like crest on the back. The species is shy, tolerates heat and dryness poorly, and many animals in the trade are wild-caught, so it is for the experienced keeper.

Family: Chamaeleonidae Former name: *Chamaeleo quadricornis; Chamaeleo eisentrauti; Trioceros eisentrauti*

KEY FACTS

THE ANIMAL

Adult size	**20-37 cm** total length incl. tail
Lifespan	**3-7 years**
Active	**By day**
Lifestyle	**Arboreal**
Habitat	**Montane forest**
Difficulty	**Experienced**

CARE

Min. enclosure	**60 × 60 × 90 cm** L × W × H for 1 adult
Temperature, day	**20-25 °C**
Temperature, night	**13-18 °C**
Humidity	**50-100%**
UVB	**Recommended** Ferguson zone 2
Diet	**Insects**
Kept	**Singly**

BREEDING

Reproduction	**Egg-laying**
Sexually mature	**6 months**
Clutch size	**8-15 eggs**
Clutches per year	**2-4**
Incubation	**120-150 days** at 20-23 °C

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Vulnerable (VU)**

About the species

Trioceros quadricornis is a medium-sized, arboreal chameleon. The male reaches 25-37 cm in total length, while the female is 5-7 cm shorter and slightly more heavily built. The male typically has four prominent horns on the snout, but the number varies from one to six, and the horns can break off. Some females have one or two small horns at the tip of the snout. The male also has a distinct bulge at the base of the tail and a beard of elongated scales under the throat. Along the back and the inner third of the tail stands a tall sail-like crest, which the species shares with several other chameleons from the African mainland. The species name means four-horned (Latin *quadri*, four, and *cornu*, horn).

The base colour is light to dark forest green, sometimes with blue-green or turquoise tones. Along the upper side of the body run wavy, bluish-white or parchment-coloured clouds. The casque is tall and often spotted in blue or orange, but the species has no occipital lobes. The claws can be red.

Three subspecies have been described: *T. q. quadricornis*, *T. q. gracilior* and *T. q. eisentrauti*. The last is often treated as a separate species, but the genetic distance to *T. quadricornis* is small, and it is therefore now regarded as a subspecies. The species can be confused with *Trioceros montium*, which also has a sail-like crest.

T. quadricornis is shy and withdrawn and more sensitive to disturbance than many other chameleons. Towards conspecifics it is only moderately aggressive.

Distribution and habitat

Trioceros quadricornis occurs only in a few mountain areas along the Cameroon Line: in western Cameroon and on the Obudu Plateau in south-eastern Nigeria. The nominate form lives in the Manengouba Mountains and on Mount Kupe. *T. q. gracilior* is found in the Bamenda Highlands, the Bamboutos Massif, on Mount Lefo, in the Oku Massif and on the Obudu Plateau, and *T. q. eisentrauti* only in the Rumpi Hills in Cameroon.

The range is small and divided into islands of mountain forest. The total extent of occurrence is estimated at about 13,300 km², but the area the species actually lives in is only about 1,000 km². The species is listed as Vulnerable (VU) on the IUCN Red List, because the forests are being cleared for forestry and agriculture and because collecting for the trade has caused populations to decline.

> **Native range:** Cameroon and Nigeria.

HABITAT

The species lives in intact mountain forest and cloud forest with little human disturbance, mostly at 1,150-2,400 m. The altitude range is narrow, probably because other chameleons keep the species out of lower and higher zones, and not because the animal cannot cope with other temperatures. The species is also seen at the edge of montane savanna.

The climate is cool and very humid. Rainfall in the Cameroon mountains can reach several thousand mm a year, and the temperature seldom rises above 25-27 °C. The nights are cooler, and humidity rises towards saturation.

Read more: Humidity, misting and ventilation

Care

THE ENCLOSURE

An adult needs a mesh enclosure of at least 60 × 60 × 90 cm (length × width × height), and preferably up to 120 cm high. Bigger is always better. The species is kept alone, as it stresses easily, and a restless or overcrowded enclosure can lead to loss of appetite, respiratory infections and, in the worst case, death, especially in females.

A mesh or hybrid enclosure provides the ventilation the species needs. Glass enclosures retain heat and have poor air circulation, and together with the high humidity this leads to bacterial and fungal growth. Glass sides also act as mirrors, so the animal thinks there is a conspecific nearby, which causes stress. Place the enclosure away from windows, as the species overheats quickly in direct sun.

Furnish the enclosure densely with live plants, such as dwarf schefflera and a hanging plant in a basket at the top, and with clean, dry branches of different thicknesses, so that the feet get varied exercise. Avoid poisonous plants such as ivy and philodendron. Put up a thermometer and a hygrometer from day one. The floor can be a capillary mat, which is easy to rinse, and a drain prevents standing water.

TEMPERATURE

The species is a cool-loving mountain species. The daytime temperature should be 20-25 °C, and 22-25 °C is ideal. At night the temperature should drop by about 5 °C to 13-18 °C, and it must not be held up with lamps or heat mats. The species copes without problems with regularly dropping to 14-15 °C at night.

Sustained values of 10-12 °C or below and sustained values above 29 °C are risky. Heat and dryness are the greatest danger, and the species quickly suffers heatstroke. If the temperature in the enclosure rises above 27 °C, or the humidity falls below 50 %, the enclosure must be moved to a cooler or more humid spot. The species seldom basks, so a small low-wattage bulb above the enclosure is enough. A sick or stressed animal more often seeks out the light.

HUMIDITY AND WATER

Humidity should be at least 50 % and preferably 70 % or more by day and rise towards 100 % at night. If humidity is persistently low, the animal dries out and develops kidney and respiratory diseases. If humidity cannot be kept high, plenty of drinking water is even more important.

The species drinks droplets from the leaves. Mist the enclosure and the plants heavily several times a day, or use an automatic sprinkler system that runs about four times a day. With hand misting, a drip system where the water runs over the leaves should run once or twice a day in addition to the misting. An ultrasonic humidifier with an automatic cut-off at the bottom of the enclosure can help, but the air must still be moving.

Sunken eyes are a sign of dehydration. Place the animal on a large potted plant in the shower and let it be rained on by a cool, fine shower (about 18 °C) for at least an hour. If the eyes are still sunken a couple of hours later, a vet with reptile experience must be contacted.

LIGHTING AND UVB

The species is diurnal. UVB fluorescent tubes are the best main light, and a small incandescent bulb is enough as a basking spot. Natural sunlight without glass is a great advantage, as ordinary window glass filters out UVB. A stay outdoors on sunny days is beneficial as long as the temperature is low enough and there is plenty of shade, as the animal overheats easily.

The UVB zone has not been measured for the species. Zone 2 is borrowed from *Trioceros jacksonii*, which is also a mountain chameleon and is placed in zone 2-3. This corresponds to a UV index of no more than about 1-3 at the highest place the animal can sit, with shade lower down. Tubes are replaced according to the manufacturer's instructions. Day length is about 12 hours, as the species lives close to the equator.

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

FEEDING

Trioceros quadricornis is insectivorous. Offer as varied a diet as possible: small moths, flies, snails, woodlice, crickets and superworms. Moths, flies and snails are seldom refused. Fatty waxworms are given only sparingly. Give 5-6 insects per meal, no more than twice a week to adults, and let them run freely in the enclosure. Feeding from a dish can be used but carries a greater risk of tongue injuries.

Keep the animal lean and well hydrated. Overfeeding produces sluggish animals and, in females, dangerously large clutches. Newly acquired animals may refuse food for days and weeks, and during that period water is far more important than food.

The feeder insects must themselves have a good diet of carrots and leafy greens. The species is sensitive to too much vitamin A, so vitamin supplements are used only very sparingly or not at all, and a mineral supplement is given occasionally.

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

BEHAVIOUR AND HANDLING

The species is kept singly. Housing animals together causes stress, and females can die of respiratory infection or stop eating. The species is shy and withdraws, and it is handled as little as possible.

A healthy animal has plump, firm skin, not wrinkled, and large, round, alert eyes. Check the mouth for sores, tongue inflammation and heavy saliva, and listen for wheezing or crackling when it breathes. Wild-caught animals need a faecal sample examined by a vet who knows chameleons, as a light parasite burden is easy to treat when discovered early.

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

Breeding

SEXUAL MATURITY AND SEXING

The male is recognised by a distinct bulge at the base of the tail, a beard of elongated scales under the throat and typically four horns. Some females have one or two small horns at the tip of the snout. The male is the larger. The young are sexually mature after about 6 months.

Females that lay many clutches wear out and live shorter lives than males: about 3-4 years against 5-7 years for the male. Females can develop egg-laying problems, and overfeeding increases the risk.

MATING

Put the female into the male's enclosure. A female that is not receptive may turn dark and rock back and forth, but the male often mates anyway. Several matings ensure enough sperm for all the eggs.

The female can store sperm and lay several clutches after a single mating, but if she is mated too seldom, the proportion of fertilised eggs in the later clutches falls. It is therefore an advantage to mate her again shortly after laying. The female becomes clearly rounder 3-4 weeks after mating, the eggs can be felt as small oval lumps, and close to laying they are seen as bulges on the body. The female can normally be put with the male again two weeks after laying, if she is in good condition.

EGG-LAYING AND CLUTCHES

The female lays 8-15 eggs per clutch. She can lay 2-4 clutches a year. Repeated clutches burden the female and shorten her life.

Give her a bucket or tub with at least 30 cm of moist potting soil that does not collapse when she digs a hole. There must be no standing water at the bottom. A plant, branches and a small lamp above the container help. The female often digs many trial holes, and it can take hours or days. When she is finished, she looks thinner and stops covering the holes.

INCUBATION

When the female has covered the eggs and climbed back up into the plants, the eggs are carefully dug up. They are placed half-buried in rows in a closed plastic container half-filled with moist vermiculite; a squeezed handful should yield only a drop or two. The container stands steadily at 20-23 °C. The eggs and the temperature are checked once a week, and opening the lid weekly provides enough air exchange.

The eggs hatch after 4-5 months.

REARING THE YOUNG

Newly hatched young dry out very quickly and need the same cool temperatures and the same high humidity as the adults, with even greater care. The young can be kept together for about a month and must then be separated. Figures for the size and growth of the young are not documented.

Health and common mistakes

Typical problems and husbandry errors:

- Dehydration: sunken eyes, wrinkled skin and loss of appetite. Caused by too low humidity and too little drinking water.
- Heat stress and heatstroke: lethargy, dark colour and gaping. The species tolerates temperatures above 27 °C and dry air poorly.
- Respiratory infections: wheezing breath, saliva and gaping with an open mouth. Caused by stagnant air and stress.
- Kidney failure after prolonged dehydration.
- Intestinal worms and other parasites in wild-caught animals. Moving lumps under the skin suggest a heavy infestation that is difficult to treat.
- Obesity and egg-laying problems in females.
- Tongue injuries from dish feeding.
- Too much vitamin A from overdosing vitamin supplements.

Weigh the animal regularly. Contact a vet experienced with reptiles if the animal stops eating, has sunken eyes that do not recover or has difficulty breathing.

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.