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POISON DART FROGS

Polkadot Poison Frog

Oophaga arborea

Oophaga arborea is a small poison dart frog of 20-22 mm that lives high up in the trees in the humid montane forest of western Panama. It is black or brown with round yellow spots, breeds in bromeliads 10-16 m above the ground, and the tadpoles feed only on eggs from the female. The species is critically endangered.

Family: Dendrobatidae Former name: *Dendrobates arboreus*

KEY FACTS

THE ANIMAL

Adult size	**20-22 mm** snout-vent length
Lifespan	**5-10 years**
Active	**By day**
Lifestyle	**Arboreal**
Habitat	**Montane forest**
Skin toxins in the wild	**Mild**
Skin toxins in captivity	**None** Captive-bred animals. Wild-caught animals can keep their toxins for a long time
Difficulty	**Expert**

CARE

Min. enclosure	**60 × 45 × 80 cm** L × W × H for 2 adults
Temperature, day	**20-24 °C**
Temperature, night	**15-19 °C**
Humidity	**70-100%**
Water	**No water dish**
UVB	**Optional** Ferguson zone 1
Diet	**Small invertebrates (springtails, fruit flies)**
Kept	**In pairs**

BREEDING

Reproduction	**Egg-laying**
Development	**Tadpoles carried to water**
Egg-laying site	**In leaf axils (e.g. bromeliads)**
Eggs per clutch	**4-8**
Hatching	**14 days**
Larval period	**40-50 days** from hatching to metamorphosis
Larval diet	**Unfertilised eggs from the female**
Parental care	**Guards the eggs, carries the tadpoles and feeds the tadpoles with eggs**

PROTECTION AND PAPERWORK

CITES	**Appendix II**
IUCN	**Critically Endangered (CR)**

About the species

Oophaga arborea is a small *Oophaga* of 20-22 mm from snout to vent. The ground colour is black, brown or bronze-brown, and the back and belly are dotted with round yellow spots, which are most often smaller than the eye and often slightly raised. The skin is rough to slightly granular. The eyes are brown, and there are no teeth in the upper jaw. The fingers have broad adhesive discs, which suit life in the trees. The male has a small vocal sac that hangs in folds when not in use.

The species was described in 1984 by Myers, Daly and Martínez as *Dendrobates arboreus* and has since been moved to *Oophaga*. It is closest to *Oophaga pumilio*, *Oophaga sylvatica*, *Oophaga speciosa* and *Oophaga granulifera*.

In the skin of wild animals 14 different alkaloids have been found, first and foremost pumiliotoxins and allopumiliotoxins, and the species is counted among the more toxic in the genus. An extract of the skin is lethal to mice when injected into the tissue. How dangerous the toxin is on skin contact is not known. As in other poison dart frogs, the toxin comes from the diet in the wild, and animals that grow up on ordinary feeder insects do not produce toxin. Wash hands after working in the enclosure, and do not touch eyes and mouth.

Distribution and habitat

Oophaga arborea is found only in western Panama, along the watershed in the Cordillera de Talamanca, at about 800-1200 m altitude. The type locality lies in cloud forest at 1120 m on the continental divide, on the border between the provinces of Chiriquí and Bocas del Toro. The species is also known from the Pacific side near Lake Fortuna, from the Palo Seco forest reserve and from La Amistad International Park. On the Caribbean side in Bocas del Toro, records have been reported all the way down in the lowlands at 20 m. The species lives right up to the border with Costa Rica, but whether it also occurs on the other side has not been investigated, because the area is difficult to access.

The range is smaller than 5,000 km², divided into several separate populations. The species is listed as Critically Endangered. Logging, collection for the pet trade and chytrid fungus threaten it; the fungus has already decimated other amphibians in the same area. Parts of the range lie in protected areas.

Read more: Quarantine and hygiene

> **Native range:** Panama.

HABITAT

Oophaga arborea is a pronounced tree dweller that lives in bromeliads and epiphyte-covered branches at 10-16 m height in humid montane rainforest, at the transition between submontane forest and cloud forest. Mosses and lichens cover almost all trunks and branches, and the clumps of plants hold large amounts of water. The male typically calls from a bromeliad leaf. On the forest floor the species has been seen only very rarely, and in lower bromeliads it has not been found. Up to eight animals can sit in the same tree, because the overgrown branches have many bromeliads to spread over. *Oophaga speciosa* and *Atelopus varius*, both of which are declining, live in the same forest.

The climate is tropical with small variations in monthly mean temperature, but large variations over the day. Heavy rain falls, often with wind from the Caribbean, and there is no pronounced dry season. The clouds hang low and settle as mist on the mountainsides, and the weather can change in a few minutes between sun, mist and torrential rain. The annual mean temperature is about 19 °C at 1200 m altitude. The highest temperatures, about 23 °C, are measured from May to September, and the lowest daily mean temperatures are about 15-16 °C in December and February. After heavy rain and on windy nights the temperature can fall towards 10 °C, and in strong sun it can reach 26 °C. The males call mostly in the morning and not in cold wind, heavy rain or strong sun.

Care

THE ENCLOSURE

Almost nothing is known about the care of *Oophaga arborea*, and the species is almost unknown in captivity. Husbandry is based on the climate of its range, cool and humid with large daily swings at 800-1200 m, and on its habitat in the tree canopy. Better-known species in the same genus are *Oophaga pumilio*, *Oophaga sylvatica*, *Oophaga lehmanni* and *Oophaga histrionica*, and the figures below are borrowed from them. *Oophaga granulifera* is also related, but lives in the lowlands and has different requirements. *Oophaga speciosa* lives in the same forest but is likewise unknown in captivity. The cool climate and tadpoles that feed only on eggs from the female make the species a task for experts.

A tall vivarium of at least 60 × 45 × 80 cm (length × width × height) suits one pair; the dimensions are an estimate. Height matters more than floor area. Mount a large, central bromeliad high up on a branch or a cork back wall as a permanent breeding plant. Add more branches, climbers, moss and smaller bromeliads so that the animals can move at several heights. Use a drainage layer of expanded clay pebbles covered by a mesh, and above it unfertilised soil or coconut fibre with a layer of dry leaves. Good ventilation is necessary because the species lives high up in moving air, but humidity must be kept up. The vivarium must be able to cool down strongly at night.

Read more: Humidity, misting and ventilation Read more: Terrarium construction and bioactive substrate Read more: Rearing tadpoles

TEMPERATURE

The daytime temperature should be 20-24 °C, and at night it should fall by at least 4-5 °C, to about 15-19 °C. This corresponds to the climate of the cloud forest with an annual mean temperature of about 19 °C. In the wild the night can go down towards 10 °C, but a fall to 15-19 °C is enough to give the enclosure the cool daily rhythm. The daytime temperature must not exceed 26 °C; in the wild this happens only in strong sun. Place the enclosure in a cool room without direct sun, and cool with a fan. Animals from the lowest localities can be kept slightly warmer. Heating is normally not necessary.

HUMIDITY AND MISTING

Humidity should be 70-80 % by day and rise to 100 % at night. Use plenty of mist and rain, and let the enclosure dry quickly afterwards with the help of a fan; stagnant, wet air is dangerous. Rain or mist systems that run several times a day correspond to the climate of the cloud forest, where mist and torrential rain alternate. Mist with rainwater, reverse-osmosis water or dechlorinated water. The axils of the bromeliads must always contain water.

WATER AND WATER QUALITY

A water bowl is not necessary. The frogs get moisture from mist, rain and the water-filled bromeliads, which are also used for the tadpoles. The water in the bromeliads must be clean and refreshed regularly with rainwater, reverse-osmosis water or dechlorinated water. Amphibians absorb water and substances through the skin, so there must be no soap, chemicals or pesticides on plants and decor.

LIGHTING AND UVB

The species lives high up in the canopy, where the light is stronger than on the forest floor, but the mist dampens it. Use LED or fluorescent tubes with high efficiency, preferably about 6,500 K, 10-12 hours a day, enough for the plants and bromeliads to grow. The light must not heat up the enclosure. No need for UVB is documented, so UVB is optional; a weak UVB light in Ferguson zone 1 can be used.

Read more: Lighting and UVB

FEEDING

Adults are fed small, flightless fruit flies, springtails, newly hatched micro crickets and field plankton; the same feeder insects are used for the other species of the genus. In the wild the food is small arthropods, and that is where the toxin comes from. Feed adults every other day, and young daily. Dust the food with calcium and vitamin powder intended for amphibians, weekly for adults and at every other feeding for young. The feeder insects must be small. Keep your own cultures of fruit flies and springtails. Remove dead feeder insects from the enclosure.

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

BEHAVIOUR AND HANDLING

Oophaga arborea is a diurnal tree frog that is rarely seen on the ground. The males are not aggressive towards each other, either in the wild or in captivity, as is known from *Oophaga pumilio*, and up to eight animals can sit in the same tree. This is probably because there are so many bromeliads that the breeding sites do not need to be defended. The best way of keeping them is not known, and a pair is the cautious choice. The males call with a loud, harsh, insect-like chirp, especially in the morning in dry, still and not too warm weather. The frogs must not be handled. Wash hands before and after working in the enclosure.

Breeding

SEXUAL MATURITY AND SEXING

Sex differences and age at sexual maturity are not known for *Oophaga arborea*. Males are recognised by the call and the small vocal sac. Sexual maturity is expected to resemble *Oophaga pumilio*, about 10-12 months, and lifespan the 5-10 years that applies to the other species of the genus. A pair is obtained by letting young animals grow up together.

MATING

The male calls from a bromeliad leaf. If the female is receptive, she takes part in a courtship, and afterwards a small batch of eggs is laid on the leaf, which the male fertilises. The courtship closely resembles *Oophaga pumilio*. A strange male can sneak in on a pair during egg-laying without calling and presumably also fertilise the eggs. A marked drop in temperature at night and changing humidity are regarded as necessary to get the species to breed.

EGGS AND TADPOLES

The female lays 4-8 eggs, on average 5, on a leaf in a bromeliad. The female stays with the eggs for a short time, after which the male covers them with his body and keeps them moist. When the eggs hatch, the female carries the tadpoles to the water in the leaf axils of the bromeliads, where they develop. The tadpoles live on unfertilised eggs that the female lays for them; they have no other food. Use several bromeliads at different heights so that each tadpole can have its own pool of water.

METAMORPHOSIS

The eggs hatch after about 14 days. The development of the tadpoles is not documented; in *Oophaga pumilio* it is complete after about 40-50 days under natural conditions, and this is an estimate that may be too low at low temperatures. Artificial rearing requires the same procedure as for *Oophaga pumilio*, where each tadpole lives alone in a small container and is fed regularly. When the forelimbs emerge, the tadpole must be able to get out of the water: lower the water level and provide a sloping surface with damp moss.

REARING THE YOUNG

The newly metamorphosed young are not described. As in other *Oophaga* species they are very small and need the smallest feeder insects: springtails, newly hatched crickets and small fruit flies, daily and dusted with calcium and vitamins. The young should stay with the parents for as long as possible and then have their own humid enclosure with many hides, branches and small bromeliads.

Health and common mistakes

There are no known diseases specific to the species. For a cool montane species the following apply in particular:

- Chytrid fungus: species at altitude are particularly exposed, and the fungus has decimated other amphibians in the same area. Signs are lethargy, reddening or flaking skin and weight loss. Quarantine new animals and use clean equipment.
- Heat stress: temperatures above 26 °C and stagnant air weaken the animals. Cool the enclosure at once.
- Desiccation: humidity that is too low causes lethargic, sunken animals that stop eating.
- Calcium deficiency and malnutrition: too few or too uniform feeder insects cause deformed limbs. Add calcium and vitamins and vary the food.

Contact a vet with knowledge of amphibians if a frog does not eat for several days, is lethargic or has obvious sores.

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.