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POISON DART FROGS

Golden Poison Frog

Phyllobates terribilis

Phyllobates terribilis is the largest of the poison frogs, 4-5 cm, and in the wild one of the most toxic animals known. It lives only in a small patch of rainforest on Colombia's Pacific coast. Captive-bred animals are practically non-toxic, bold and always on show, and the species has become one of the most commonly kept poison frogs in the hobby.

Family: Dendrobatidae

KEY FACTS

THE ANIMAL

Adult size	**4-5 cm** snout-vent length
Lifespan	**8-15 years**
Active	**By day**
Lifestyle	**Terrestrial**
Habitat	**Rainforest**
Skin toxins in the wild	**Strong**
Skin toxins in captivity	**None** Captive-bred animals. Wild-caught animals can keep their toxins for a long time
Difficulty	**Intermediate**

CARE

Min. enclosure	**60 × 50 × 50 cm** L × W × H for 2 adults
Temperature, day	**21-25 °C**
Temperature, night	**18-21 °C**
Humidity	**70-100%**
Water	**Water dish** depth 1-2 cm
UVB	**Optional** Ferguson zone 1
Diet	**Insects and small invertebrates (springtails, fruit flies)**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Tadpoles carried to water**
Egg-laying site	**On the ground**
Sexually mature	**16-20 months**
Eggs per clutch	**10-30**
Hatching	**10-25 days** at 22-24 °C
Larval period	**30-60 days** from hatching to metamorphosis
Larval diet	**Complete diet**
Parental care	**Guards the eggs and carries the tadpoles**

PROTECTION AND PAPERWORK

CITES	**Appendix II**
IUCN	**Endangered (EN)**

About the species

Phyllobates terribilis was described in 1978 by Charles Myers, John Daly and Borys Malkin. The species name means "terrible" and refers to the violent skin poison.

Adults measure 4-5 cm from snout to vent. The males reach up to 45 mm and the females up to about 55 mm. The females are thus slightly larger, and also broader across the belly, but the sexes are hard to tell apart. The adults are almost uniformly coloured: golden yellow, yellow, orange, greenish yellow or mint green to cream. In the hobby the yellow animals are often

called "Quebrada Guangui" after the type locality and the mint-green ones "La Brea", but the colours occur side by side in the wild, so the names say little about the animals' actual origin. An orange line with black feet, "Orange Black Foot", has been bred in captivity in Colombia. The young are black with two broad yellow stripes along the back, and after 3-4 months the yellow has almost displaced the black.

In the wild the skin contains batrachotoxin, one of the most powerful poisons in the animal kingdom. It keeps the sodium channels of the nerve cells open and can lead to paralysis and cardiac arrest, and the poison from a single wild frog is estimated to be able to kill 10-20 people. The frog does not make the poison itself. It takes it up, or its precursors, from its food in the rainforest, and exactly which prey animals supply it has not been settled. Captive-bred animals that grow up on feeder insects therefore lack the poison and are harmless to humans. The skin can, however, irritate mucous membranes, so wash your hands and do not handle the animals.

Wild-caught animals are a different matter altogether. They can keep the poison for a very long time, and even small amounts can be life-threatening if they get into the mouth or a wound. Handle them only with nitrile gloves, and treat any animal of uncertain origin in the same way. The species has been subject to illegal collecting.

In the hobby, *P. terribilis* has previously been confused with the smaller *Phyllobates bicolor*, and hybrids exist. The first true *P. terribilis* probably did not reach European terrariums until 1996, so older literature must be read with caution. Never mix different *Phyllobates* species or colour forms.

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

Distribution and habitat

Phyllobates terribilis lives only on Colombia's Pacific coast in the Chocó rainforest. The few known occurrences are in the catchments of the Río Saija and Río Naya and at Boca Yurumanguí in the department of Cauca, and the species is also reported from Valle del Cauca. The type locality is Quebrada Guangui on the upper Saija, and La Brea lies about 15 km from there.

At the IUCN assessment in 2017, the known localities together covered only about 1,475 km². The species is assessed as endangered (EN), because the forest is being cleared for agriculture, settlement and mining, and because the watercourses are polluted by pesticides. There is only one small officially protected area, Reserva Rana Terribilis. Collecting for the pet trade no longer plays a major role, because captive-bred animals are readily available.

> **Native range:** Colombia.

HABITAT

Phyllobates terribilis lives in warm, very humid, hilly lowland rainforest, both in primary forest and older secondary forest, typically near rivers on slopes and hilltops. The altitude is given both as 30-400 m above sea level and as sea level to about 200 m. About 4,000 mm of rain falls per year, in some places more, and the temperature is high all year round with a humidity of 80-90 %.

The frog is diurnal and lives in the leaf litter on the forest floor. Thanks to the poison it is not shy: it moves about openly in the middle of the day and is evenly distributed in the forest without gathering in clumps. There are no true seasons, but the shift between rainy season and dry season gives a certain rhythm to activity and breeding. The male carries the tadpoles to small bodies of water, for example water in bromeliads and holes in trees.

Read more: Humidity, misting and ventilation Read more: Rearing tadpoles

Care

THE ENCLOSURE

A pair of *Phyllobates terribilis* needs an enclosure of at least 60 × 50 × 50 cm. A group of 4-6 animals needs at least 90 × 50 × 50 cm, and more animals require more floor area. The species is one of the most ground-dwelling poison dart frogs, so floor area counts most, but it also likes to climb, and a planted back and side wall with small shelves gives extra space.

A glass enclosure with ventilation at the bottom at the front and at the top at the back or side creates a chimney effect that keeps the panes free of condensation without the moisture disappearing. All openings must be covered with mesh that fruit flies cannot get through. The floor is built up from a drainage layer of clay pebbles or gravel, a water-permeable cloth and on

top a damp substrate of e.g. coconut fibres, soil and moss. A layer of dry oak or beech leaves provides cover, especially for juveniles.

Plant densely with plants that tolerate heat and moisture. Adults like to sleep in the leaf axils of bromeliads, but bromeliads easily rot if they stand in constantly wet soil, so mount them high. Furnish with roots and cork, a few flat stones that dry quickly, and several egg-laying sites at different heights. Fixed feeding dishes make it easy to see that all animals get food. For juveniles, a 30 × 30 × 25 cm rearing enclosure can hold up to 15 animals at first.

Read more: Terrarium construction and bioactive substrate Read more: Feeder animals: keeping and breeding

TEMPERATURE

During the day it should be 21-25 °C, preferably a couple of degrees warmer at the top of the enclosure, and at night 18-21 °C, which corresponds to room temperature. The temperature must not exceed 27 °C for any length of time.

The species is relatively tolerant, but like all poison dart frogs it tolerates prolonged heat poorly. Avoid direct sun, and use a digital thermometer with a probe down in the enclosure. Heat mats and heating cables are normally not used; the necessary warmth comes from the room and the lighting.

A couple of degrees cooler and slightly drier conditions in winter are an advantage. This gives the females a break from egg-laying for a few weeks and seems to give a longer life. This is not a true winter rest.

HUMIDITY AND MISTING

Humidity should be high, 70-100 %, but the floor must not become boggy. A rain system is the easiest, for example with three mistings a day of 20-60 seconds, depending on the nozzles. A rule of thumb is that leaves and furnishings should be dry again about an hour after misting. In winter misting is less frequent or shorter.

A fogger can bring the humidity up to around 100 % for short periods, and it clearly gets the frogs calling and moving. Use reverse osmosis water or rainwater, so that panes and leaves do not get limescale spots. Stagnant, constantly wet air causes mould and bacteria, so misting and ventilation must be balanced.

WATER AND WATER QUALITY

Provide one or more small water dishes with about 2 cm of water, for example saucers or halved Brazil nut shells, which the animals can easily climb out of. Many terrariums for poison frogs have a sloping floor with a small water feature in front of the pane and a drain, so that the water can easily be changed.

Use rainwater, reverse osmosis water or dechlorinated water. Amphibians absorb water and substances through the skin, so soap, cleaning products, hand cream and insecticides must never come near the terrarium or the water. Change the water often, and scrub the dishes with hot water without soap. Tadpoles are raised in their own containers (see Eggs and tadpoles).

LIGHTING AND UVB

The light is first and foremost for the plants. Fluorescent tubes or LED bars for about 12 hours a day are enough, and the day length may vary slightly over the year. The frogs can be kept without UV light with no visible difference in wellbeing, but a weak UV content can be provided just to be safe. UVB is therefore optional; if you choose it, stick to Ferguson zone 1, and provide shade. The frogs get their vitamin D3 through the supplement on the food.

Read more: Lighting and UVB Read more: Calcium, vitamins and supplements

FEEDING

Phyllobates terribilis takes larger prey than most poison dart frogs. In the wild ants are the main food, but it takes many kinds of small arthropods. The daily staple is wingless fruit flies, preferably the large *Drosophila hydei*, and adults also take medium-sized crickets, pinhead crickets, aphids, bean weevils, white woodlice and now and then a waxworm. Juveniles get springtails, small fruit flies and micro crickets.

Adults are fed every second or third day. Juveniles are fed daily or several times a week. Avoid overfeeding: the frogs easily become fat, and hungry animals eat the food before the vitamin powder has rubbed off. Fixed feeding spots, e.g. a small dish with a piece of banana, gather the fruit flies, and the frogs quickly learn to come when the lid is opened.

Dust the feeder animals with a vitamin and mineral powder for amphibians, preferably at every feeding, and give the feeder animals good food themselves. Your own cultures of fruit flies and springtails ensure an even supply.

BEHAVIOUR AND HANDLING

Phyllobates terribilis is diurnal, bold and inquisitive and is out on show most of the day with a short break in the middle of the day. The males call with a soft, bird-like trill, especially after misting. The species can be kept in pairs, because both males and females can fight, but groups of at least five often work without problems too. Aggression shows as animals jumping on each other, grabbing each other around the head or pushing each other away from the feeding dish. It happens especially right after a move, but may require the animals to be separated.

Do not handle the animals. Captive-bred animals are practically non-toxic, but the skin is thin, and salt, soap and cream from your hands can damage it. If a frog has to be moved, coax it into a clean plastic tub. Wash your hands before and after working in the terrarium, and use nitrile gloves if you are not sure of the animals' origin.

Breeding

SEXUAL MATURITY AND SEXING

The sexes are hard to tell apart. The females are slightly larger and broader across the belly, and the males are recognised by their call. The males become sexually mature at about 37 mm and the females at 40-41 mm, at an age of 16-20 months, and the first breeding attempts begin at 1.5-2 years. The first clutches from young females are often small and infertile. The surest route to a pair is to buy a small group of juveniles and let them grow up together.

MATING

Phyllobates terribilis can breed all year round, but if a rhythm of rainy season and dry season is kept, breeding peaks at the start of the rainy season, in the terrarium typically in spring. The females then lay eggs every 2nd-3rd week.

The male calls, and a receptive female strokes him over the back with a front foot. He then hops to a suitable egg-laying site, and she follows. The ritual of calling, touching and hopping can be repeated for hours before the pair chooses a spot. There is no amplexus: the male deposits his sperm and leaves, and the female then lays the eggs, which can take several hours. A cooler and drier period in winter gives the females a much-needed break.

EGGS AND TADPOLES

Each clutch is 10-30 eggs depending on the female's age and condition; young and old females lay fewer. The eggs are about 2.5 mm without the jelly and are laid on smooth surfaces in hiding places. Provide several egg-laying sites at different heights: film canisters, halved coconut shells with a small entrance on a saucer or ready-made egg caves from the pet shop. The eggs have never been found in the wild; everything known about the clutches comes from captivity.

The male returns, moistens the eggs and guards them. When the tadpoles hatch, he sits among them so that they can wriggle onto his back, and he can then spend several days finding a suitable small pool.

If you want to rear them deliberately, you take the clutch out once the eggs have been laid and put it in a closed plastic box without ventilation at 22-24 °C with a little reverse osmosis water or rainwater, so that the eggs are moist without standing under water. Dead or mouldy eggs are carefully removed with a spoon. The tadpoles measure about 11 mm at hatching. For the first weeks they are kept in a shallow dish with about 1 cm of water, which is gradually raised, and are then raised individually in tubs of 200 ml to 1 litre or communally, up to 30 in a cycled 60 × 30 × 30 cm aquarium with a sponge filter at about 23 °C. Use only soft, slightly acidic reverse osmosis water or rainwater (pH about 6), preferably with a couple of oak or catappa leaves. The tadpoles are fed fine fish food, shrimp food or mixes for tadpoles. The water is changed about every third day in small tubs and weekly in larger ones.

METAMORPHOSIS

The eggs hatch after 10-25 days depending on the temperature, at 22-24 °C after about three weeks, and hatching can stretch over several days. The newly hatched tadpoles mostly lie still on the bottom and do not begin to swim freely until after about two weeks. Larval development then lasts 1-2 months, depending on temperature and food.

When all four legs have developed, metamorphosis is near, even though the tail is still long. Move the tadpole to a tilted tub with a lid and air holes, where 2-3 cm of water collects at one end, so that the little frog can climb onto land by itself. Once it has climbed out, it is moved to a rearing terrarium.

REARING THE YOUNG

The newly metamorphosed froglets are black with a yellow, U-shaped stripe and much shyer than the adults. Keep them in a small terrarium with the same climate and furnishings as the adults', but slightly cooler, about 23 °C and not below 20 °C in winter, with a good layer of leaf litter to hide in. A small terrarium makes it easier to keep the density of feeder insects high.

For the first ten days or so the froglets live off the remains of the tail. After that springtails are the best food for the first couple of weeks, followed by small fruit flies and micro crickets, always dusted with vitamin and mineral powder. Feed once or twice daily at first and less often as they grow. Sort the young by size after a few weeks. At about three months they are regarded as stable, and after 3-4 months the colour change is largely complete.

Health and common mistakes

Phyllobates terribilis is hardy when the climate is right. Typical problems are:

- Chytrid fungus (*Batrachochytrium dendrobatidis*), which has wiped out entire populations in terrariums. Quarantine new animals and have them tested, and disinfect furnishings before they go into the terrarium.
- Spindly leg: young that develop forelegs that are too weak or none at all during metamorphosis. The cause has not been established, but the food for tadpoles and parent animals, the water quality and too many tadpoles in the same water are suspected.
- Overheating: prolonged heat above 30 °C causes stress and can kill the animals.
- Deficiency diseases such as soft bones and crooked legs if the food is not dusted with vitamins and minerals.
- Parasites such as roundworms and flagellates, which show up as emaciation despite a good appetite. A faecal sample at the vet will reveal them.
- Obesity in adult animals that are fed too often.

Contact a vet with amphibian expertise if a frog loses weight, stops eating or gets sores or discolouration on the skin. Say so if the animal is wild-caught.

Read more: Quarantine and hygiene

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.