herpy

POISON DART FROGS

Mimic Poison Frog

Ranitomeya imitator

Ranitomeya imitator is a small, diurnal poison frog of 16-20 mm from northern Peru. Each local form mimics a different toxic frog in the same area, and the species was the first amphibian in which true monogamy was demonstrated: the pair look after the young together, and the female feeds each tadpole with infertile eggs.

Family: Dendrobatidae Former name: *Dendrobates imitator; Ranitomeya intermedia*

KEY FACTS

THE ANIMAL

Adult size	**16-20 mm** snout-vent length
Lifespan	**5-10 years**
Active	**By day**
Lifestyle	**Arboreal and terrestrial**
Habitat	**Rainforest and 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	**Intermediate**

CARE

Min. enclosure	**45 × 45 × 45 cm** L × W × H for 2 adults
Temperature, day	**21-26 °C**
Temperature, night	**18-22 °C**
Humidity	**70-100%**
Water	**Water dish** depth 1-2 cm
UVB	**Optional**
Diet	**Small invertebrates (springtails, fruit flies)**
Kept	**In pairs**

BREEDING

Reproduction	**Egg-laying**
Development	**Tadpoles carried to water**
Egg-laying site	**On the ground**
Sexually mature	**5-8 months**
Eggs per clutch	**1-8**
Hatching	**7-16 days**
Larval period	**60-80 days** from hatching to metamorphosis
Larval diet	**Complete diet and 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	**Least Concern (LC)**

About the species

Ranitomeya imitator is a slender, small poison frog. Adults measure about 16-20 mm from snout to vent. Large females reach 18-19 mm and males are slightly smaller, but precise scientific measurements are not documented. Females are distinctly broader than males, especially when carrying eggs.

The species is famous for its local forms. Four main types are known, each resembling a different *Ranitomeya* species living in the same place: a striped form and a spotted, predominantly blue-green highland form, both resembling *R. variabilis*, a banded form resembling *R. summersi*, and the Varadero form resembling *R. fantastica*. The phenomenon is called Müllerian mimicry: toxic species with the same warning colours protect each other, because predators only have to learn one pattern. Where the forms meet, there are transition zones, and the animals prefer a partner of their own form.

The species was described by Rainer Schulte in 1986 as *Dendrobates imitator* and has since been moved to the genus *Ranitomeya*. It has become a popular research animal because it was the first amphibian shown to be genetically monogamous: the male and female stay together for months, defend a shared territory and share the care of the young.

Skin toxicity: Poison frogs do not produce their poison themselves. Wild *R. imitator* have alkaloids in the skin, including pumiliotoxin B, and they come from the diet, presumably small arthropods such as ants and mites. The toxicity is modest compared with the large poison frogs. Captive-bred animals, which live on fruit flies and springtails, lack the poison or have very little, while wild-caught animals can retain it for a long time. Skin toxicity is therefore regarded as mild. Do not handle the frogs, wash your hands after working in the enclosure, and do not touch your eyes and mouth afterwards.

The temperament is lively and bold. The males call with a short, buzzing trill and often sit out in the open on leaves and branches.

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

Distribution and habitat

Ranitomeya imitator occurs only in north-central Peru, east of the Andes. The striped form is the most widespread and lives in the lowlands along the lower part of the Huallaga River drainage. The spotted form belongs in higher-lying areas, where it lives alongside the spotted highland form of *R. variabilis*, and the banded form lives in an area with *R. summersi*. Between the forms lie narrow transition zones, which researchers have used to study how colour patterns arise and are kept apart.

The species is assessed as Least Concern (LC). Deforestation for agriculture and illegal collecting for the pet trade are the known threats.

> **Native range:** Peru.

HABITAT

Ranitomeya imitator lives in humid tropical forest, where it stays in the low vegetation above the forest floor. The eggs are laid hidden near the ground, while the tadpoles grow up in small bodies of water in plants. The species uses especially the leaf axils of *Heliconia*, where the pools hold on average only about 24 ml. So little water contains almost no food, and this is precisely why the female has to feed the tadpoles with eggs. The banded form lives in a drier climate than the others and is found especially in *Dieffenbachia* and *Heliconia*.

The climate in the range is warm and uniform: the annual mean temperature is about 25 °C, with an average of about 21 °C in the coldest month and about 29 °C in the warmest. The altitude and humidity in the wild are not documented.

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

Care

THE ENCLOSURE

A pair of *R. imitator* needs an enclosure of at least 45 × 45 × 45 cm. The frogs readily climb, so the height is used.

Set up with a drainage layer, a substrate that holds moisture and a thick layer of dead leaves. Line the back and side wall with cork, and plant densely with climbers such as *Ficus pumila* and golden pothos and small bromeliads that form pools of water in the leaf axils. Put film canisters or similar small containers at an angle of 35-45 degrees so there is a little water at the bottom; the pair uses these for eggs and tadpoles. Springtails and small woodlice in the substrate clean up and are a snack for the frogs at the same time.

Keep only one pair in the enclosure. In a group, sexually mature females can eat each other's eggs and become aggressive towards each other. Never put different forms or species together, so you avoid crossbreeding.

Read more: Terrarium construction and bioactive substrate

TEMPERATURE

Keep the enclosure at 21-26 °C by day and 18-22 °C at night. The species thrives best at about 21-24 °C. The temperature must not exceed 27 °C for long periods, and above 29 °C is dangerous: heat is more dangerous than cold.

Extra heat is rarely necessary in a heated living room; the light for the plants often provides enough. Never put the enclosure in direct sunlight, because it quickly becomes lethally hot behind the glass. Measure with a digital thermometer both at the bottom and at the top. No cool rest period is documented for the species.

HUMIDITY AND MISTING

Humidity should be 70-100 %. Aim for almost 100 % morning and evening and 70-75 % in the middle of the day, so the enclosure is allowed to dry out a little between mistings. The species tolerates down to 50 % only briefly, and only if it has access to water. Low humidity without water can quickly become fatal.

Mist daily with reverse-osmosis water or rainwater. A misting system can, for example, run three times a day for two minutes at a time, split into short bursts of ten seconds with equally long pauses. Provide a little air exchange, so there is no stagnant air that causes mould.

WATER AND WATER QUALITY

A shallow water dish or a bromeliad with water in the leaf axils is enough. The water must not be deeper than allows the smallest frog to sit in it with its head and upper body above the water, because the species swims poorly. 1-2 cm is a suitable level. Change the water when it becomes cloudy, and use reverse-osmosis water, rain water or dechlorinated tap water. Amphibians absorb substances through the skin, so never use soap or cleaning products in the enclosure; rinse with hot water instead.

Tadpoles reared without the parents are kept separately. Small plastic containers of 10 × 10 × 10 cm with reverse-osmosis water, a couple of oak leaves and a stalk of hornwort work well, and two thirds of the water is changed every second to third day.

LIGHTING AND UVB

R. imitator is diurnal and lives in the shade under the forest canopy. The lighting is first and foremost for the plants. Give LED light for 12-14 hours a day, for example from 8 to 20 hrs. It is not documented that the species needs UVB, and it is normally kept without. If you nevertheless choose a weak UVB source, make sure there is plenty of shade, so that the frogs can choose for themselves. At night it must be dark.

Read more: Lighting and UVB

FEEDING

The staple food is small arthropods: flightless fruit flies (*Drosophila melanogaster*), springtails and small woodlice. Large adults can also take the larger *D. hydei*. Adults are fed every second day with enough that it is eaten by the next feeding. Young must be fed every day.

Dust all feeder insects with a vitamin and mineral supplement. A mineral powder with D3 together with a multivitamin works well. Overdosing of certain vitamins can be harmful, so follow the manufacturer's instructions. Start your feeder cultures before the frogs move in: the species is so small that it is entirely dependent on a stable supply of fruit flies and springtails.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

R. imitator is bold and diurnal and is often seen out in the open in the enclosure. The male calls from fixed spots, and both sexes defend the pair's territory against conspecifics. In captivity two animals of the same sex can end up fighting, and what may look like mating is often two males or two females in a dispute, because poison frogs do not have true amplexus.

A pair stays together for a long time, so breaking up a well-functioning pair is not advisable. The frogs should not be handled. The skin is thin and delicate, and residues of soap, cream and oil from the hands can harm them. If a frog has to be moved, lure it into a transparent tub. Watch for animals that hide all the time, lose weight or are chased, and move them in good time.

Breeding

SEXUAL MATURITY AND SEXING

The sexes look alike, but adult females are distinctly broader than males, and only the male calls. Juveniles cannot be sexed. The animals become sexually mature at 5-8 months; scientific figures for age at sexual maturity are not documented. The surest way to a pair is to buy several juveniles and let them find each other.

MATING

R. imitator is regarded as one of the easiest poison frogs to breed. The male calls as he approaches the female. If she is interested, she follows him to a hidden egg-laying site, often in a bromeliad or a film canister, where they mate. A pair stays together for a long time and breeds again and again as long as conditions are good.

Give the pair several film canisters and bromeliads to choose from, and leave them in peace. Stable temperature, high humidity and plenty of food are what is needed; no particular trigger such as a rainy season is documented in captivity.

EGGS AND TADPOLES

The female lays 1-8 eggs at a time, in the wild most often 1-4, on a leaf or a smooth surface out of the water. The male keeps the eggs moist and guards them.

When the eggs are ready to hatch, the male frees the tadpoles from the egg membrane. They climb onto his back, and he carries them one at a time to separate small pools of water. He then checks the pools every few days. When a tadpole is hungry, he calls the female over, and she lays an infertile feeder egg in the water. In the wild this happens on average every 7th day throughout development. Without feeder eggs the tadpoles starve in the small pools of water.

In the enclosure you can let the pair raise the young themselves; tadpoles that stay with their parents end up larger than those that are removed. If you remove the tadpoles, keep them separately in small containers and feed with fine tadpole food or crushed dry food for aquarium fish and algae.

METAMORPHOSIS

The eggs hatch after 7-16 days. Hatching time depends on whether the male helps: he normally frees the tadpoles after 7-14 days, whereas eggs without parents hatch by themselves after about 16 days at 24 °C.

From hatching to metamorphosis takes 60-80 days, at a constant 24 °C about 67 days. When the front legs appear, the tadpole stops eating. Put a piece of cork on the water surface so it can climb out, and move it to a container with a good land area when the tail is nearly absorbed.

REARING THE YOUNG

Newly metamorphosed frogs are very small. Keep them in a small, humid rearing container with dried leaves, cork and a shallow water dish. Feed daily with springtails and the smallest fruit flies, and lightly dust the food with vitamins and minerals. The juveniles are ready for sale when they are 2-3 months old and about 13 mm long.

Juveniles can go together in a small group of evenly sized animals. As they approach sexual maturity after 5-8 months, watch for aggression and split them into pairs.

Health and common mistakes

R. imitator is hardy when temperature and humidity are right, and most problems are caused by husbandry:

- Heat above about 27 °C, e.g. from sun through a window, causes stress, loss of appetite and in the worst case death.
- An enclosure that is too dry, or too wet and stagnant, gives dry animals or skin infections and mould.
- Feeder insects without a vitamin and mineral supplement cause weakened bones, especially in females that lay many eggs.
- A thin frog without a round belly can be caused by too little or too much food, parasites or competition. Check that all animals get food.
- Fights between animals of the same sex and females that eat each other's eggs. Keep only one pair in the enclosure.

A healthy frog has intact skin without sores or red, cottony areas, particularly around the vent and on the insides of the hind legs. Seek a vet with amphibian experience quickly, and isolate the animal if it stops eating, becomes lethargic or develops sores or swellings.

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.