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SALAMANDERS AND NEWTS

Japanese Fire-bellied Newt

Cynops pyrrhogaster

Cynops pyrrhogaster is a medium-sized aquatic newt of 9-13 cm from Japan with an arched, brown to black back and a red to orange belly with a mottled pattern of black spots and streaks. It is hardy and long-lived and tolerates warmer water than most salamanders, but does best kept cool. The newly metamorphosed young live on land for up to several years, and this is the most difficult part of breeding.

Family: Salamandridae

KEY FACTS

THE ANIMAL

Adult size	**9-13 cm** total length incl. tail
Lifespan	**20-30 years**
Active	**At dusk and at night**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland and temperate woodland and meadow**
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	**75 × 35 × 35 cm** L × W × H for 2 adults
Temperature, day	**15-21 °C**
Temperature, night	**12-18 °C**
Humidity	**70-90%**
Water	**Aquaterrarium** depth 20-30 cm
Water temperature	**15-21 °C**
UVB	**Optional**
Diet	**Insects and worms/snails**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**In water**
Sexually mature	**12-36 months**
Eggs per season	**100-400**
Hatching	**18-25 days**
Larval period	**90-180 days** from hatching to metamorphosis
Larval diet	**Small aquatic invertebrates (daphnia, mosquito larvae)**
Parental care	**None**

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Near Threatened (NT)**

About the species

Cynops pyrrhogaster is a medium-sized aquatic newt of 9-13 cm; some animals grow up to 15 cm. Males are 8-10 cm, females 10-12 cm. The species is long-lived: in captivity it typically lives 20-30 years, and some animals have lived much longer. The back is chocolate brown to black, sometimes with red spots along the dorsal edges, and the back is arched. The skin is rough and granular, the parotoid glands behind the head are distinct, and the tail is relatively pointed. The underside is red, orange

or something in between, with variable black markings in the form of spots, blocks, wavy lines or net patterns. In the breeding season males acquire smoother skin, a bluish or purple sheen along the tail and often a thin tail tip. Males also have a swollen cloacal region.

The species is divided into several local races with different colour and body shape, including Sasayama, Atsumi, Hiroshima, Kanto and Tohoku. Some are genetically distinct and may in time be split into several species. Without a known collecting locality it is almost impossible to determine which race an animal belongs to. The races vary in size (the Tohoku race is the largest) and in how much time they spend in water.

The species is often confused with *Cynops orientalis*, which is often sold as it. *C. orientalis* is smaller, has smooth skin, a flat back and a round tail tip.

Wild animals contain large amounts of tetrodotoxin, a neurotoxin that is meant to keep birds and mammals away. The poison comes almost entirely from the food, and animals bred from eggs in captivity contain no measurable poison. The poison is dangerous only if swallowed; on skin contact it can irritate mucous membranes. Wash your hands before and after contact with animals and water, and do not touch your eyes and mouth.

Distribution and habitat

Cynops pyrrhogaster is native to Japan and is found on the islands of Honshu, Shikoku and Kyushu. It is widespread almost everywhere in the country, and the individual races each have their own area: Tohoku in northern Honshu, Kanto on the Tokyo plain, Atsumi on the Atsumi Peninsula, Sasayama in the eastern Chugoku region and Hiroshima on Kyushu, Shikoku and in Chugoku.

> **Native range:** Japan.

HABITAT

C. pyrrhogaster lives in still and slow-flowing, clear fresh water: ponds, ditches, rice paddies, waterholes, small lakes and calm pools in streams. Fast-flowing water is avoided. The populations live across a wide temperature range, and the animals prefer cool water.

Some populations are almost purely aquatic, while others spend most of the year on land and go into water only to breed. The species breeds in spring until the beginning of June, mostly in April. In winter the animals dig down into decomposing plant material to avoid frost and ice-covered water. The young live on land for one to three years before returning to the water as sexually mature animals.

Care

THE ENCLOSURE

A pair needs an aquarium of at least 75 litres, for example 75 × 35 × 35 cm. More animals require more space; for a group of five adults about 90 × 45 × 60 cm is suitable. Long and low is better than tall, because the animals use the floor area. The aquarium must have a tight, secure lid, because salamanders escape through small openings.

The species is active, but slow, and likes dense planting with plants that thrive in cool conditions, for example Java moss, hornwort, anubias and Riccia. Add roots or artificial decoration as hides. Avoid loose stones, which can topple and crush the animals. Use a bare bottom or fine sand. Gravel, which the animals can get into their mouths, can lodge in the intestine, and this is almost always fatal.

A land area is necessary, even though the species can be kept in water all year. A piece of floating cork, a planted land section or a piece of clean polystyrene foam gives the animals the opportunity to climb out. If the land section has a layer of damp substrate, the animals can also dig down and rest.

TEMPERATURE

The water should preferably be 15-21 °C. The species tolerates warmer water than most salamanders, but high temperature stresses the animals and makes them more susceptible to infections. Keep the water below 23 °C, even in summer; from about 24 °C the heat can quickly become dangerous. Place the aquarium in the coldest room, for example in the cellar, and cool the water if necessary.

In winter the temperature is lowered by 5-8 °C. This is not necessary to keep the animals alive, and the species also breeds without a cold winter, but a cool winter clearly promotes breeding and is recommended. At night the water may fall to 12-18 °C.

HUMIDITY AND MISTING

The species lives in and near water, so the humidity above the water is not critical and has not been measured for the species. Under a tight lid it is high, about 70-90 %. The land area must be damp, so animals that go onto land do not desiccate. Moss or damp bark provides cover and moisture. Misting is not necessary.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water level is at least 1.5 times the length of the largest animal, in practice 20-30 cm, and more in larger aquariums. The animals can be kept in water all year when they have a land area. The water must be clean, treated against chlorine and 15-21 °C.

Use a filter that does not produce a strong current, because the species swims poorly in fast water. Sponge filters with an air pump are suitable. Avoid hang-on filters on the edge of the aquarium, because the opening is almost impossible to secure against escape. Change about 25 % of the water weekly, and remove uneaten food.

LIGHTING AND UVB

The species is predominantly nocturnal and does not require any particular lighting. Live plants require ordinary aquarium light. UVB is not necessary, but can be provided as an addition, as long as there are hides and deep, cool water where the animals can retreat from the light. The light period follows the season, with shorter days in winter.

Read more: Lighting and UVB

FEEDING

Adults are easy to feed and take many kinds of food. The diet is based on chopped earthworms, blackworms, white worms, thawed bloodworms and brine shrimp. They also eat most feeder insects. Lean strips of ox heart can be given in small amounts, and there is dry food for salamanders, which some animals take. Mealworms should be avoided, because the shell is hard to digest; newly moulted larvae and pupae are fine. Feeder fish carry a risk of parasites and infections and are not recommended.

Adults are fed three times a week. Give only as much as the animals eat in about 10 minutes, and remove the rest. Variety is important. Carotenoids in the food, for example crustaceans, maintain the red belly colour. White worms provide no colour, and bloodworms only a little. Captive-bred animals without carotenoids in their food may develop a yellow belly.

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

BEHAVIOUR AND HANDLING

The species is slow and calm and can be kept in pairs or groups when there is space and many hides. The animals are active in the evening and at night. During feeding they may snap at each other, so give food in several places. Small animals may be eaten by larger ones. Do not keep the species with other amphibians, because many of them secrete substances from the skin that are harmful in a closed aquarium.

The animals should preferably not be handled. The skin is delicate. Always keep a tight lid on, because both adults and young climb well.

Breeding

SEXUAL MATURITY AND SEXING

Males can be recognised by a swollen cloacal region, and in the breeding season they acquire smoother skin and a bluish or purple sheen on the tail. Females are larger. The animals become sexually mature after 1-3 years, once the young have spent the time on land and returned to the water.

MATING

The species breeds in spring. A winter with water 5-8 °C cooler promotes mating behaviour, but is not necessary, and many animals also breed at room temperature all year. Males chase the females, block their way, nudge them and wave their tails, so that scent substances are carried towards the female. In some races the male lays a hind leg over the female's neck during courtship, and in others the female pushes or bites the male. The female picks up the male's spermatophore.

EGGS AND LARVAE

The female lays 100-400 eggs over the season, up to 40 at a time. The eggs are laid singly and folded in between the leaves of aquatic plants. They hatch after about 20 days, depending on temperature.

The larvae are best raised separately from the adults, which otherwise eat eggs and larvae. They have external gills and need live food several times a day: newly hatched artemia, daphnia and infusoria, later bloodworms, small earthworms and white worms.

METAMORPHOSIS

The larvae metamorphose after 3-6 months, depending on temperature and food. The gills and fin fold disappear, the larva stops eating for a period, and the young salamander leaves the water. At metamorphosis the young are 25-45 mm long, and they often have a yellow to reddish dorsal stripe. From then on they need land-living food: springtails, white worms, fruit flies, small earthworms and other tiny animals. Feed daily at first, and reduce gradually.

Newly metamorphosed animals are shy of water and can drown even in very shallow water. Therefore give them land and a shallow dish of water, no deeper than they can wade in.

Read more: Feeder animals: keeping and breeding Read more: Rearing tadpoles

REARING THE YOUNG

The small salamanders are terrestrial for 1-3 years. There are two good ways to rear them. Simple and easy to monitor: a small terrarium with damp kitchen paper, a shallow water dish and hides of cork bark, dead leaves or pieces of clay pots. Change the paper often, and see how much each animal eats. More natural: a substrate of coconut fibre and soil with moss and leaf litter, in which you can place springtails and isopods. Here it is harder to monitor the individual animal, and there is a risk of mould.

Suitable food is springtails, white worms, fruit flies, tiny crickets, small earthworms and thawed bloodworms given with tweezers. Small earthworms are the best growth food. Dust crickets with vitamin and mineral powder at every feeding, and do not give too many at a time, because they can bite and stress the young. Fruit flies are dusted every second or third time. Fruit flies escape easily, so use a tight lid with a piece of fabric underneath. The young climb well, and constant climbing is a sign that something is wrong: too wet, too dry, lack of hides or food.

About a year after metamorphosis most are ready to enter the water, if they are gradually accustomed to shallow water with many plants. Some animals grow faster than others; sort them by size, so the largest do not eat the smallest. Generous feeding shortens the terrestrial phase.

Health and common mistakes

The species is hardy, but only when temperature and water quality are in order. The most common problems are:

- Temperature too high. This causes stress, a weakened immune system and illness and can become fatal, especially above 23-24 °C.
- Poor water quality. Uneaten food and plant remains cause fungal and bacterial infections on the skin.
- Intestinal blockage after swallowing gravel. Use a bare bottom or fine sand.
- Drowning of newly metamorphosed young that are water-shy.
- Parasites and infections from feeder fish.

The species can, like Asian salamanders in general, carry Bsal (*Batrachochytrium salamandrivorans*), a fungal disease that is fatal to many salamanders, without showing signs itself. Quarantine new animals for several weeks, use separate equipment for each aquarium, and wash your hands between aquariums. Never release animals or water into the wild. See a vet with amphibian expertise if animals become emaciated, develop sores or white coatings, swell up or behave unusually.

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.