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SALAMANDERS AND NEWTS

Palmate newt

Lissotriton helveticus

Lissotriton helveticus is a small newt of 5-10 cm from western Europe. It is recognised by its unspotted throat and, in the breeding season, by the male's thin tail filament and black webbing between the hind toes. The species is cool-loving and adaptable, more aquatic than most small newts, and thrives in a cool aquaterrarium.

Family: Salamandridae English name: Palmate Newt Former name: *Triturus helveticus* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**5-10 cm** total length incl. tail
Lifespan	**4-12 years**
Active	**At dusk and at night**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland and temperate woodland and meadow**
Skin toxins	**Mild** Wash your hands after contact and keep your fingers away from your eyes and mouth
Difficulty	**Intermediate**

CARE

Min. enclosure	**60 × 30 × 30 cm** L × W × H for 4 adults
Temperature, day	**10-18 °C**
Temperature, night	**8-14 °C**
Humidity	**80-100%**
Water	**Aquaterrarium** depth 10-20 cm
Water temperature	**10-18 °C**
UVB	**Not required**
Winter rest	**5-10 °C** 8-12 weeks
Diet	**Insects, small invertebrates (springtails, fruit flies) and worms/snails**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**In water**
Sexually mature	**24-36 months**
Eggs per season	**150-440**
Hatching	**8-28 days**
Larval period	**45-105 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	**Least Concern (LC)**

About the species

Lissotriton helveticus is one of the smallest newts in Europe. Males grow to 5-9 cm, and females are slightly larger, reaching up to 10 cm. Both sexes are olive-brown to brown with some dark spots, which in females sometimes form two lines along the back. A dark stripe runs from the snout through the eye. The underside is yellow to pale orange and whitish on the sides; the

belly may have a few dark spots, but the throat is always unspotted. This is the most reliable feature for telling it from *L. vulgaris*.

The skin is dry and velvety on land and smooth in water. In the breeding season the male develops a low, smooth dorsal crest, which is higher on the tail, ridges along the sides of the back that give the body an angular cross-section, strong black webbing on the hind feet and a 4-7 mm filament at the end of the blunt tail. The female develops no crest, filament or webbing, but has an orange stripe on the tail. The male's cloaca is larger and darker than the female's. If there are predators such as goldfish in the water, males develop the crest, filament and webbing less strongly.

The species was described in 1789 and long belonged to the genus *Triturus*, before the small newts were brought together in *Lissotriton*.

The skin has poison glands. The toxin has not been measured in *L. helveticus* itself, but the skin secretion in the genus *Lissotriton* contains low amounts of toxins and can irritate mucous membranes. Wash your hands after handling. The temperament is calm, and in the wild the animals live for up to 12 years.

Distribution and habitat

Lissotriton helveticus lives in western Europe, from Great Britain, including Scotland, to northern Spain and Portugal. To the east it reaches the Elbe in Germany, the Czech Republic and the lower and middle parts of the Alps in Switzerland. It is found from sea level up to 2,500 m in the Pyrenees, but is most common at 500-1,500 m. The species is the most common newt in France, but rare in Belgium and the Netherlands, and on the Iberian Peninsula the populations are scattered. In south-western Ireland it has been found recently, and it is unclear whether the population is native.

> **Native range:** United Kingdom, France, Belgium, Netherlands, Luxembourg, Germany, Switzerland, Czechia, Spain and Portugal.

HABITAT

Lissotriton helveticus lives in woodland, bogs, on grassland and in gardens, and it breeds in both small and large waters, preferably fish-free, acidic ponds. The species is especially common on heathland and raised bog, where it breeds in shallow ponds on acidic ground, and it also tolerates slightly brackish water.

On land the animals are most active at night and stay under stones, wood and leaf litter. They tolerate dry weather better than *L. vulgaris* and are often found further from water. The breeding season usually runs from February to May. Hibernation normally takes place on land, sometimes in water, and on the Iberian Peninsula the animals are often active all year.

Read more: Brumation and the seasons

Care

THE ENCLOSURE

Lissotriton helveticus is more aquatic than most small newts, and in a set-up many animals stay in the water for most of the year and go on land only for a short period in late summer. An aquaterrarium of 60 × 30 × 30 cm suits up to 4 adults, and a larger one gives more peace. The water section takes up most of the floor, is 10-20 cm deep and is planted with soft aquatic plants such as Canadian waterweed, milfoil and java moss, in which the female can fold her eggs. The land section can be an island of stones or a floating panel with soil, sphagnum and moss, so the animals can switch between water and land themselves, and bark and cork provide hiding places.

The animals climb up glass and squeeze through small gaps, so the set-up must have a tight-fitting lid that also retains humidity but provides ventilation. The land section must be damp, but never soaked. Newly metamorphosed juveniles live on land and need a set-up without deep water.

Read more: Humidity, misting and ventilation

TEMPERATURE

Lissotriton helveticus is cool-loving. The daytime temperature is 10-18 °C and the night-time temperature 8-14 °C. Temperatures above 20 °C for long periods should be avoided. The species is active right down towards freezing point, but stops eating below about 2 °C. Place the set-up somewhere cool without direct sun; in hot summers a chiller, a fan over the water or a cellar can help.

For breeding, about 15 °C after a cool period is suitable. Hibernation can take place on land in damp moss and leaf litter or in the water in a cold, frost-free room, where the animals still eat a little in mild periods. It lasts 8-12 weeks at 5-10 °C, typically from November to February; the figures are borrowed from *L. vulgaris*.

HUMIDITY AND MISTING

The skin dries out quickly, so humidity over the land section must be 80-100 %. Spray the land section with dechlorinated water once or twice a day, and let the moss and soil retain moisture without it becoming swampy. Good ventilation prevents mould and stagnant air. If it becomes too dry, the animals hide or head for the water, and the skin becomes dull.

WATER AND WATER QUALITY

The water section is 10-20 cm deep and 10-18 °C. Use dechlorinated tap water, tap water that has stood for a few days, or rainwater. The species readily lives in acidic, soft waters and tolerates low pH, but chlorine is harmful. A small filter with a gentle flow keeps the water clean; without a filter, a third is changed weekly, and food remains are removed daily. The bottom can be bare or of coarse sand or large stones, never fine gravel, which can be swallowed. Amphibians absorb substances through the skin, so soap, cleaning products and hand cream must not come near the water.

LIGHTING AND UVB

UVB is not necessary for the species, which lives hidden and is nocturnal. Ordinary LED light for 10-12 hours a day gives the plants what they need, and more light in spring helps bring the animals into breeding condition. The lamp must not warm the water. Plants and hides must provide plenty of shade.

Read more: Lighting and UVB

FEEDING

Lissotriton helveticus eats all small animals it can swallow. In the water it is given daphnia, tubifex, mosquito larvae and frozen bloodworms, and it also takes frozen food from the bottom. On land it is given small earthworms, white worms, aphids, fruit flies, small woodlice and small snails. On land, motionless food is rarely taken, so land food must be live.

Adults are fed two to three times a week in small portions. The feeder animals must be small, because the species is small. A varied diet makes supplements less important, but for juveniles and for females in the egg-laying season the food can be dusted with calcium and vitamins for amphibians.

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

BEHAVIOUR AND HANDLING

The species is peaceful and can be kept in pairs or in groups with more females than males, so the females get peace in the breeding season. Many plants and good hides also help. The animals can be kept with other small newts of the same size and with the same temperature requirements, but not with larger crested newts, which eat them, and not with fish. The animals should not be handled more than necessary; if an animal has to be moved, use wet hands, a small net or a cup. Keep the lid closed, because the animals are good at escaping.

Breeding

SEXUAL MATURITY AND SEXING

In the breeding season the male is recognised by the low crest, the filament at the end of the tail, the black webbing and the swollen cloaca. The female is slightly larger, has an orange stripe on the tail and neither crest nor filament. Outside the breeding season the male is recognised by the larger and darker cloaca, while juveniles can hardly be told apart. The animals become sexually mature after 2-3 years. A pair or a group with more females than males ensures that the females are mated.

MATING

The breeding season is triggered by rising temperature and day length after a cool period, usually from February to May. The animals are moved to the water section, or the water level and temperature are raised. Males may be in breeding dress as early as midwinter when the animals overwinter in water. Mating follows a fixed pattern: the male swims in front of the female, sniffs her cloaca and waves his tail, so scent molecules drift towards her. If she is interested, she follows, and he deposits a sperm packet, which she takes up with her cloaca. Fertilisation is internal.

EGGS AND LARVAE

The female lays 150-440 eggs over a season, one at a time, each folded into a leaf of an aquatic plant. Egg-laying can stretch from March to June. The eggs are 1.3-1.8 mm, with a jelly capsule of 2-3 mm, and resemble the eggs of *L. vulgaris*. Milfoil, java moss and Canadian waterweed are good to lay in. Adults eat eggs and small larvae, so the eggs or the adults are moved to a separate tank with the same water.

The larvae hatch after 8-21 days, at low temperatures after about four weeks, and are 8-14 mm long. They have external gills and two small adhesive organs on the head, with which they hang on to the plants for the first few days while they live on the yolk. After that the larvae are predators and will only take live food: first infusoria and newly hatched daphnia or artemia, later cyclops, larger daphnia, mosquito larvae and white worms. Food is given daily in clean, cool water, and in the first weeks no more than 10-20 % of the water is changed at a time. The larvae are sorted by size, because larvae also eat eggs and smaller larvae. They grow to 3-4 cm.

METAMORPHOSIS

The larvae metamorphose after 1.5-3.5 months, depending on temperature and food; some larvae overwinter in the water and metamorphose only the following year. When all four legs have developed, the gills and the skin fold on the tail are drawn in, and the larvae often eat less in that phase. Lower the water level to a couple of centimetres, and put out stones, cork or floating plants, so the metamorphosed animals can climb out without drowning. The juveniles leave the water at about 25 mm and are moved to a land set-up. Rarely, animals become sexually mature with gills and stay in the water all their lives.

REARING THE YOUNG

The newly metamorphosed juveniles live on land until they are sexually mature after 2-3 years. Keep them in a damp, cool enclosure with a layer of soil, turf or moss, bark and leaves. White worms can be put out in the soil, where they multiply and give the juveniles something to hunt, and in addition they are often fed aphids, springtails, wingless fruit flies and small woodlice. Keep the juveniles sorted by size and separate from the adults. In winter they can be kept cool in an unheated room and fed less often. Only when sexually mature are they moved to an aquaterrarium.

Health and common mistakes

The main problems in care are:

- Heat: temperatures above 20 °C for a long time stress the animals, cause poor appetite and can lead to disease and death. Keep the set-up cool.
- Desiccation: the skin is delicate and dries out quickly if the land section is not kept damp.
- Fungal infections and skin sores, often after poor water quality or too many animals. Use clean, dechlorinated water, and change it regularly.
- Constipation: fine gravel and sand can be swallowed. Use a bare bottom, coarse sand or large stones.
- Larvae floating belly-up: underfed larvae or larvae kept too close together can swallow air. Place the larva in a dish with so little water that it cannot turn over, and give plenty of food.
- Infections that spread in a group. Animals with swellings, lethargy, bleeding in the skin or loss of appetite are moved immediately to a separate tank.

The fungus *Batrachochytrium salamandrivorans* (Bsal) is deadly to many salamanders. New animals are quarantined before being put with others, each set-up has its own equipment, and hands and tools are cleaned between set-ups. Animals, water and tools must never come into contact with wild amphibians, and food from ponds with wild amphibians can carry infection. Captive-bred animals less often carry diseases and parasites than animals from the wild. See a vet with knowledge of amphibians if an animal becomes ill.

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

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.