herpy

SALAMANDERS AND NEWTS

Southern Crested Newt

Triturus karelinii

Triturus karelinii is a large, robust crested newt of 12-18 cm from the Crimea, the Caucasus and the southern shore of the Caspian Sea. It has brown to grey, warty skin, and the throat and belly are orange or yellow with small black spots. In spring the male develops a tall, serrated crest. The species is hardy and easy to keep, and it can be kept both on land and in water.

Family: Salamandridae Former name: *Triturus cristatus karelinii* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**12-18 cm** total length incl. tail
Lifespan	**8-11 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	**Beginner**

CARE

Min. enclosure	**45 × 30 × 30 cm** L × W × H for 4 adults
Temperature, day	**12-20 °C**
Temperature, night	**8-15 °C**
Humidity	**70-95%**
Water	**Aquaterrarium** depth 15-30 cm
Water temperature	**10-20 °C**
UVB	**Not required**
Winter rest	**4-10 °C** 6-12 weeks
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	**150-400**
Hatching	**14-35 days**
Larval period	**56-112 days** from hatching to metamorphosis
Larval diet	**Complete diet, other larvae and 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

Triturus karelinii is a large and powerfully built crested newt that resembles *Triturus cristatus* but is larger and more robust. Adults grow to 18 cm. The back is brown to grey with darker spots. The throat is yellow to orange with black spots, like the belly, whereas its close relatives mostly have a dark throat with white dots. There is little or no white stippling along the flanks. The female may have a yellow to orange stripe along the back, but it is less distinct than in *T. carnifex*.

In the breeding season the male develops a tall, serrated crest from the neck over the tail and a white band along the sides of the tail. The female is more heavily built and may look pear-shaped, whereas the male is slimmer and has a large vent. The species was formerly included in *T. cristatus* as a subspecies. In 2013 the populations in the Balkans and western Anatolia were separated as *Triturus ivanbureschi*, and in 2016 the populations in northern Anatolia as *Triturus anatolicus*, so the current *T. karelinii* occurs further east. Crested newts can hybridise with one another, so different species are not kept together.

The skin of crested newts secretes toxins in small amounts, and threatened animals secrete a milky substance. It can irritate mucous membranes, so wash your hands after handling, and do not touch your eyes or mouth. For *T. karelinii* itself the toxicity has not been measured.

Care is the same as for the other crested newts. Figures for egg-laying, larval period and hatching are not documented for *T. karelinii* and are borrowed from crested newts as a group. In the wild males live to about 8 years and females to about 11 years. Lifespan in captivity is not documented for the species.

Distribution and habitat

Triturus karelinii lives in the Crimea, in the Caucasus and south of the Caspian Sea. The south-eastern populations in the Balkans and western Anatolia now belong to *Triturus ivanbureschi*, and the populations in northern Anatolia to *Triturus anatolicus*. Before the split the name also covered populations in Bulgaria, Greece, Serbia and Turkey, among others.

No introduced populations of the species outside its natural range have been documented. Crested newts can hybridise where their ranges meet.

> **Native range:** Ukraine, Russia, Georgia, Azerbaijan and Iran.

HABITAT

Triturus karelinii lives in a range of mountainous habitats: deciduous and coniferous forest, slopes and plateaus. In the breeding season the animals enter most kinds of water, including bogs, lakes, still ponds, ditches, temporary pools and streams. Like other crested newts, the species prefers water without predatory fish, which eat the larvae, and the larvae live freely in the water column.

For the rest of the year the animals live on land. They are most active at night and hide under stones and wood and in holes in the ground. The animals like cool conditions and avoid heat and drought.

Care

THE ENCLOSURE

Triturus karelinii can be kept following its natural cycle, with an aquatic phase and a terrestrial phase, or in water all year. Little is known about the care of this particular species, so the recommendations are borrowed from the other crested newts, *Triturus cristatus*, *Triturus carnifex* and *Triturus dobrogicus*, which have the same requirements. An aquatic set-up or a terrestrial set-up should be at least 45 × 30 × 30 cm for two pairs, and larger is always better. If the whole life cycle is to take place in one set-up, it must be correspondingly larger, so there is room for both a spacious water section and a land section. Two separate set-ups are often easiest.

The aquatic set-up can be very simple: a tank without substrate, with Brazilian waterweed (*Egeria densa*) or other plants and a few pieces of clay pipe as hides and an aid to shedding. Dense plants in mid-water are important, because the animals seek cover there and the female lays eggs in the leaves. A floating platform allows the animals to leave the water. The water should be calm, even with a filter, because the species lives in still water.

The terrestrial set-up must be well ventilated and never either bone dry or waterlogged. A layer of damp potting compost several centimetres deep retains moisture, and a layer of moss on top provides cover. Bark and stones provide more hiding places. The lid must always be tight, because newts climb up glass and squeeze through small gaps. A lid of fine mesh on a frame gives good ventilation and keeps even the smallest feeder insects in.

TEMPERATURE

The water should be kept below 25 °C, because in warmer water the animals try to leave it. The animals are fully active down to about 10 °C. The terrestrial phase is kept at roughly the same temperature as the aquatic phase: 12-20 °C by day and 8-15 °C at night. Place the set-up somewhere cool and out of direct sun; in hot spells a cool room or a cellar helps.

A cool winter is the most important prerequisite for breeding. About six weeks at 10 °C is enough to bring the animals into breeding condition, and temperatures down to 4 °C do not harm them. The winter rest is 6-12 weeks at 4-10 °C, and feeding is reduced during the period. If the temperature goes right down towards 4 °C, feeding is stopped about a week beforehand, so there is no undigested food in the gut. After the rest the animals are moved to an aquatic set-up at 15-20 °C.

HUMIDITY AND MISTING

In the aquatic phase humidity is not an issue. In the terrestrial phase the soft skin dries out quickly, so the substrate must be kept damp, with a humidity of 70-95%. Mist regularly with dechlorinated water or rainwater, preferably at one end, so that a moisture gradient forms and the animals can choose how damp they want it.

The substrate must never become waterlogged, because then it rots and fungus appears. Stagnant air also causes fungus, so ventilation must be good. If it is too dry, the animals sit still with dry, dull skin and try to get back to the water. Then humidity must be raised, or the animals must go back into the aquatic set-up.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

A water depth of 15 cm is enough, and deeper is fine: 15-30 cm gives the animals room to swim. The water is kept at 10-20 °C. The species tolerates many kinds of water, but chlorine can harm it; tap water that has stood for a couple of days is unproblematic.

A filter with a gentle flow means less work. Without a filter the water is changed regularly and the bottom kept clean. A bare bottom is easiest to keep clean; avoid gravel and small stones that the animals could swallow.

LIGHTING AND UVB

The animals are nocturnal and do not need UVB or artificial light for their own sake. The plants need light to grow, and an ordinary aquarium lamp is enough. After the winter rest, more light together with more food and rising temperature helps bring the animals into breeding condition. The lamp must not heat the water.

Read more: Lighting and UVB

FEEDING

In the aquatic phase *T. karelinii* takes a wide range of food: earthworms, freshwater shrimp (*Gammarus*), bloodworms, daphnia and white worms. Frozen bloodworms, fish food and pellets for aquatic turtles are also taken, but often have to be offered with tweezers at first. A varied diet makes vitamin and mineral supplements unnecessary, and feeder insects can be gut-loaded before they are fed.

In the terrestrial phase feeding is harder, because motionless food is seldom taken on land. Give live earthworms, white worms, waxworms, small crickets and fruit flies.

Females need to build up reserves for the next spring and may eat large quantities, whereas males must not be overfed. Adults are fed twice a week. Food from ponds and hedgerows can contain toxins or disease, so it must not be collected near polluted places or in waters with wild amphibians.

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

BEHAVIOUR AND HANDLING

Triturus karelinii is robust and easy to keep. In the water the animals snap hard at anything that moves, including each other during feeding, and in the wild crested newts also eat smaller amphibians. Between animals of the same size this seldom causes injury, but animals of different sizes must be kept separately.

In the breeding season the males are territorial and can be aggressive towards other males, especially if there are many in a small space. An animal that is being bullied is moved. The skin is sensitive, so the animals are handled only when necessary; if an animal has to be moved, use a wet hand or a net. Set-ups must always be completely closed, because the animals are skilled escape artists, and escaped animals must never come into contact with wild populations.

Breeding

SEXUAL MATURITY AND SEXING

The sexes are easy to tell apart. Males are slim with a large vent, females more heavily built and often pear-shaped. In breeding dress the male is unmistakable with his tall, serrated crest and the white band along the sides of the tail. In the wild the animals mature after 3-4 years. In captivity it goes faster: with plenty of food, also in winter, they can breed 1-3 years after hatching, depending on food and temperature. The sexes cannot be told apart as young, so for breeding you need a small group to be sure of both sexes.

MATING

Mating is triggered by a cool winter followed by rising temperature, more light and more food, especially live food. After the winter rest the animals are moved to an aquatic set-up at 15-20 °C; if they are placed on a floating platform in early spring, they normally enter the water within a few days. The males develop their crests within a few weeks, and then mating begins.

The male displays to the female with tail-fanning and whiplash strokes of the tail, arches his back and waves his crest, and there must be an open patch on the bottom for the dance. If the female is interested, the male deposits a spermatophore on the bottom and leads the female over it, so she can take it up with her vent. Males can become aggressive towards each other, especially when crowded.

EGGS AND LARVAE

The female begins to lay eggs a few days after mating and continues for several weeks, several hundred eggs in total; the figure 150-400 is borrowed from crested newts as a group. Each egg is laid singly in a leaf of an aquatic plant: the female chooses the leaf, folds it around the egg with her hind legs and presses it together, and the egg sticks the leaf fast. Brazilian waterweed (*Egeria densa*) and water forget-me-not have leaves of the right size, and strips of thin plastic about 1 cm wide also work. The female prefers to lay where the plants are dense.

The parents eat eggs and larvae, so the folded leaves are broken off and moved to a separate tub. About half of the eggs die within 1-2 weeks; this is due to a chromosome defect that crested newts have, and is normal. The dead eggs are quickly attacked by fungus and are removed, so the fungus does not spread. The eggs hatch after 2-3 weeks.

The newly hatched larvae live on the yolk for the first few days. After that they are predators: first infusoria, then cyclops and small daphnia, later larger daphnia, white worms and bloodworms. Some larvae in time take frozen bloodworms and fish food. The larvae are fed daily. They live freely in the water column, so the water must be 10-15 cm deep with plants in mid-water. The larvae are far more sensitive to water quality than the adults and need frequent water changes. Large larvae are very greedy and attack each other if they get too little food or are too crowded.

METAMORPHOSIS

The larvae metamorphose after 8-16 weeks, depending on food and temperature, when they are 5-8 cm. When metamorphosis takes place, the young must be able to climb out of the water, otherwise they may drown: a floating platform, a slope or stones sticking up.

The young can also be reared in the water if they are kept in a predominantly aquatic set-up and fed in the water; they then get used to staying there. They can also live on land as in the wild.

Read more: Rearing tadpoles

REARING THE YOUNG

The newly metamorphosed young live on land like the adults, but need smaller food: aphids, white worms, fruit flies and small crickets. They eat large quantities and grow quickly. Sort them by size, so the large ones do not take the small ones. The terrestrial set-up must be damp, cool and well ventilated. Young animals often enter the water in spring before they are sexually mature, so they need access to water.

Health and common mistakes

Triturus karelinii is hardy, and most problems are caused by mistakes in care:

- Heat: water above 25 °C stresses the animals and makes them leave the water. Move the set-up to a cooler place.
- Dryness in the terrestrial phase: still animals with dry, dull skin. Raise the humidity, and move them to the water if necessary.

- Poor ventilation: stagnant air causes fungal infections and can poison the animals with carbon dioxide.
- Fungus on eggs and skin: remove dead eggs quickly, and keep water and substrate clean.
- Larvae floating belly-up: underfeeding or crowding can make the larvae swallow air. Give plenty of food and sort the larvae by size.

The fungus *Batrachochytrium salamandrivorans* (Bsal) is fatal to many salamanders and newts. New animals must be quarantined in a separate set-up, and equipment, water and hands are kept separate between set-ups. Asian salamanders and newts can carry the infection without being ill and must never come into contact with the species, either directly or via water and equipment. If an animal becomes ill for no clear reason, contact a vet with amphibian expertise.

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.