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SALAMANDERS AND NEWTS

Marbled Newt

Triturus marmoratus

Triturus marmoratus is one of the most beautiful and largest newts in Europe: a robust salamander 13-17 cm long with a marbled green and black back, an orange stripe in the female and a tall, smooth crest in the male during the breeding season. It lives mostly on land in woodland, comes to the water to breed and thrives in a cool enclosure with a water section.

Family: Salamandridae Former name: *Salamandra elegans* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**13-17 cm** total length incl. tail
Lifespan	**15-25 years**
Active	**At dusk and at night**
Lifestyle	**Terrestrial and semi-aquatic**
Habitat	**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 × 40 × 40 cm** L × W × H for 2 adults
Temperature, day	**15-20 °C**
Temperature, night	**10-15 °C**
Humidity	**70-95%**
Water	**Aquaterrarium** depth 10-25 cm
UVB	**Optional** Ferguson zone 1
Winter rest	**4-6 °C** 8-13 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	**24-48 months**
Eggs per season	**200-350**
Clutches per year	**1**
Hatching	**14-21 days** at 10-15 °C
Larval period	**56-70 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	**Vulnerable (VU)**

About the species

Triturus marmoratus is a heavily built newt of 13-17 cm, the female slightly larger than the male. The back is dark brown to black with irregular, marbled patches of green, and the underside is dark with small white spots. Land animals have velvety, slightly warty skin, while the skin is smoother in the aquatic phase. The female and the young have an orange stripe along the

back from the head to the tip of the tail; in the male the stripe disappears at about 9 months of age. In the breeding season the male develops a tall, wavy crest with dark vertical bands, which dips at the base of the tail. Outside the breeding season only a low crest ridge remains. The female has no dorsal crest, but the tail fin becomes higher.

The species is closely related to the crested newts (*Triturus cristatus* and its relatives) and can hybridise with *T. cristatus* where the two live together in northern France. The crest is smooth, not serrated as in the crested newts. The southern form, *Triturus pygmaeus*, is now regarded as a separate species and seldom exceeds 11 cm. The requirements are broadly the same, but it benefits from a slightly milder winter.

When threatened, glands along the back and sides secrete a white, toxic fluid. How strongly it affects humans has not been described. Wash your hands after contact, and do not touch your eyes or mouth until you have done so. The animals are handled only when necessary. As in the crested newts, about half of the eggs die because of a chromosome defect that the species has naturally.

In captivity the species is calm, robust and social, but very secretive: it spends most of the year under bark, wood and moss and is seen mainly in spring and on warm evenings. The species can live up to 25 years in captivity. In the wild, animals in the mountains mature later and live longer, up to 16 years.

Distribution and habitat

Triturus marmoratus lives in western Europe: in France and in northern Spain and Portugal. It is absent from parts of the Pyrenees. In central and southern Iberia it is replaced by the closely related *Triturus pygmaeus*. In northern France the range overlaps with *Triturus cristatus*, and natural hybrids occur.

> **Native range:** France, Spain and Portugal.

HABITAT

Triturus marmoratus lives in deciduous and mixed forest and in hilly, wooded landscape, where it prefers shady, sheltered places to open country. The animals hide during the day under dead and rotting wood, stones and other cover and come out late in the evening; they are mainly nocturnal. The terrestrial phase is the longest part of the year. The breeding ponds are often temporary ponds, ditches and waterholes with vegetation. In the northern part of the range the animals enter the water from late February to late May; in the warmer and drier parts of Spain and Portugal the breeding season falls in the cool, wet winter months, and there is no real winter rest. When the ponds dry out in summer, the animals remain on land in damp refuges. After the breeding season the animals typically move about 10 m from the water but can reach up to about 160 m.

Care

THE ENCLOSURE

A pair of *Triturus marmoratus* can be kept in an enclosure of at least 60 × 40 × 40 cm. Three pairs can be kept in 120 × 30 × 40 cm with roughly half land and half water. The males are fairly quarrelsome in the breeding season, so keep more females than males. There are three ways of keeping them. A paludarium with half land and half water suits the animals all year and at all life stages. A mostly terrestrial enclosure has a large water bowl or a water section that the animals can easily get into and out of. An aquarium with a small floating island is used in the breeding season, and some animals can be kept like that all year. In any case the lid must be tight, as the animals climb and escape through small gaps, but it must be mesh to give good ventilation: humid conditions without air exchange cause skin problems.

On land a substrate of potting soil and leaf mould 8-10 cm deep suits them, with bark, moss, cork and pieces of wood as hiding places. The animals gather in groups, even when there are many hiding places. The substrate must be moist but never waterlogged. Use large stones or sand, never medium-sized gravel, which can be swallowed. For the aquatic phase a heavily planted set-up with sand or large stones suits them.

TEMPERATURE

Triturus marmoratus is adapted to a cool climate: 15-20 °C by day and 10-15 °C at night. Keep the temperature below 21 °C as far as possible; up to 25 °C is tolerated briefly, but not for longer periods. A drop in temperature at night is necessary. In the aquatic phase about 20 °C is ideal, and the animals are active down to 5 °C. A living room often becomes too warm in summer, so place the enclosure in a cellar or a cool room, or cool it with a fan.

In winter the animals are kept at about 5 °C for 2-3 months, never below 4 °C. Animals from the southernmost populations manage with a milder winter. The cooling period gives the best breeding drive (see Mating).

HUMIDITY AND MISTING

Humidity in the land section should be 70-95 %. The substrate must never dry out completely: mist lightly with dechlorinated water when the surface begins to dry. The skin is thin and dries out easily, and a water bowl helps against desiccation, but the animals must be able to get in and out of it easily. Mesh in the lid provides air exchange so that stagnant, humid air does not develop.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

In the aquatic phase and in the breeding season the water must be at least 10 cm deep, and as deep as possible during breeding (at least 25 cm). *Triturus marmoratus* lives in still water, so avoid strong currents; a sponge filter with a gentle current keeps the water clean and does not suck in larvae. Without a filter, change part of the water regularly. Use tap water that has stood, or rainwater. Water quality is not critical, but chlorine must be avoided. Plants in and above the water are used as egg-laying sites and cover.

LIGHTING AND UVB

Triturus marmoratus does not need special light or heat. Light is used to provide a natural daily rhythm and for the plants. Weak UVB (zone 1) is optional and can help the daily rhythm but is not necessary. Day length follows the season: shorter in winter, longer in spring.

Read more: Lighting and UVB

FEEDING

Triturus marmoratus feeds at night. On land crickets, waxworms, earthworms (not red compost worms), enchytraeids, fruit flies, soldier fly larvae and small isopods suit them. Give the crickets fish food before they are fed. In the water the animals take frozen bloodworms, daphnia, tubifex, brine shrimp and other live food, and some also take prepared salamander food. Adults can easily go a few days without food, while larvae must be fed daily.

With a varied diet and well-fed feeder insects, supplements are not strictly necessary, but dusting with calcium and vitamins now and then does no harm. Before the cooling period the animals must be well nourished; during cooling they normally do not eat.

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

BEHAVIOUR AND HANDLING

Triturus marmoratus is calm and social on land: many animals gladly share the same hiding place. In the water the males become more quarrelsome in the breeding season. The animals should not be handled more than necessary, because the skin is sensitive and can secrete a toxic fluid. When moving them, use a damp net or a damp hand, which is washed afterwards. The animals escape easily, so the lid must be tight.

Breeding

SEXUAL MATURITY AND SEXING

In *Triturus marmoratus* the male is recognised in the breeding season by the tall crest, a strongly swollen cloaca and the slimmer body. The female is slightly larger, has an orange dorsal stripe and no crest. Outside the breeding season the sex is harder to determine; the male's low crest ridge and colour can help. The animals reach sexual maturity after 2-4 years in captivity and after 4-7 years in the wild.

MATING

Most populations of *Triturus marmoratus* need a distinct cool period in order to breed: about 5 °C for 2-3 months in a terrestrial enclosure with plenty of moss and wood. Well-nourished animals do not need food during cooling. Afterwards the temperature is raised to 10-15 °C, and within a few days the animals take on breeding dress. Move them to a large aquarium with a small island; put them on the island, and they will enter the water when they are ready. Mating begins within a few

weeks and can last for several months; the animals leave the water only in late May or in June. The male lures with tail-fanning and the characteristic cat-back posture; the female can mate several times with several males. Animals from the southernmost populations breed without a special cool period.

EGGS AND LARVAE

The female *Triturus marmoratus* lays the eggs singly in folded leaves of aquatic plants. Egg-laying extends over weeks to months, and a female lays about 200-250 eggs in all, sometimes over 350. The eggs have no pigment. Plant material in the water is necessary as an egg-laying site. The eggs and larvae are kept at the same temperature as in the breeding aquarium, 10-15 °C. About half of the eggs die for hereditary reasons when the tail is formed, so a low hatching rate is normal. Other newts may eat the eggs, so eggs are moved or the adults removed.

METAMORPHOSIS

The eggs of *Triturus marmoratus* hatch after 14-21 days. The larvae, 8-10 mm long, are pale with two dark bands along the back and live on the yolk for the first three days. After that they are active predators in open water and need live food: newly hatched brine shrimp, young daphnia, cyclops, ostracods and other small crustaceans. Growth is rapid, and metamorphosis typically occurs after 8-10 weeks with good feeding. When the gills shrink and the legs are finished, there must be a low, damp land section where the young can climb out.

Read more: Rearing tadpoles

REARING THE YOUNG

The newly metamorphosed young are 5-8 cm long and manage in a damp enclosure with moss, leaf mould and bark. Feed them newly hatched crickets, enchytraeids and fruit flies. Young *Triturus marmoratus* can also be raised in water, if you prefer. They need the same coolness as the adults and must not be kept warm. Sexual maturity is reached after 2-4 years, earlier with plenty of food and feeding throughout the winter.

Health and common mistakes

Diseases and husbandry errors in the care of *Triturus marmoratus*:

- Skin problems if it is humid without ventilation. Use mesh in the lid.
- Desiccation if the substrate dries out. Mist, and keep a water bowl.
- Heat: longer periods above 21-25 °C stress the animals. Keep the enclosure cool.
- Larvae that have swallowed air and float belly-up cannot eat. Place the larva in a Petri dish with so little water that it cannot turn over, and give plenty of food; the air usually comes out again within a short time.
- Bsal (*Batrachochytrium salamandrivorans*) is a fungal disease that can be fatal to salamanders and newts and can be carried by animals without symptoms. Quarantine new animals, use separate equipment, and never move water, plants or equipment between enclosures without cleaning.
- Animals that will not eat or have sores or swellings must go to a vet who knows amphibians.

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.