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SALAMANDERS AND NEWTS

Rough-skinned Newt

Taricha granulosa

Taricha granulosa is a 13-22 cm long newt from the Pacific coast of North America, with a dark, granular back and a bright orange belly. The skin contains tetrodotoxin, one of the most potent toxins found in amphibians, and the animal is deadly poisonous if swallowed. The species alternates between water and land, can be kept in water all year round and must be kept cool.

Family: Salamandridae Former name: *Salamandra granulosa; Triturus granulosus; Triturus similans*

Strong skin toxins

KEY FACTS

THE ANIMAL

Adult size	**13-22 cm** total length incl. tail
Lifespan	**12-18 years**
Active	**By day and at night**
Lifestyle	**Semi-aquatic**
Habitat	**Wetland and temperate woodland and meadow**
Skin toxins	**Strong** Avoid skin contact and wash your hands thoroughly after working in the enclosure
Difficulty	**Intermediate**

CARE

Min. enclosure	**60 × 30 × 40 cm** L × W × H for 2 adults
Temperature, day	**18-21 °C**
Temperature, night	**14-18 °C**
Humidity	**80-95%**
Water	**Aquaterrarium** depth 20-30 cm
UVB	**Not required**
Diet	**Insects, complete diet and worms/snails**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**In water**
Sexually mature	**48-60 months**
Eggs per season	**7-30**
Hatching	**21-42 days**
Larval period	**60-150 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

Taricha granulosa is a stout newt with a rounded snout and granular skin. Adults are 13-22 cm long, including the tail, and males are larger than females. The back is light brown, olive, reddish brown or almost black, and the belly is yellow to orange. The eyes are small with a yellow iris and dark eyelids, and seen from above they do not protrude beyond the outline of the head. The palatal teeth are arranged in a V-shaped pattern. This distinguishes the species from *Taricha torosa*, with which it is often confused; that species has larger eyes, a pale lower eyelid and Y-shaped palatal teeth.

In the breeding season the male's skin becomes smooth, paler and spongy, the vent swells, the tail becomes broader and flatter, and the toes develop black, horny pads. The female changes only slightly; her vent becomes cone-shaped. Aquatic females can resemble breeding-season males, because they develop paler, smoother skin, a tail crest and a larger vent, but the signs are weaker.

The skin contains tetrodotoxin, a neurotoxin, which the species is thought to produce with the help of bacteria on the skin. The toxin is also found in the muscles, blood and eggs, while the larvae are not poisonous. The amount varies greatly from population to population, but a single animal can hold enough toxin to kill several adult humans, and a person has died after swallowing a newt. With ordinary handling the animal is harmless to most people, but the toxin can irritate skin and mucous membranes, and if the eyes are rubbed afterwards it is very painful. The toxin can also enter through a wound. When threatened, the animal arches its back, bends its head and tail upwards and shows its orange belly.

Two subspecies have been described: *T. g. granulosa* and the darker *T. g. mazamae* from Crater Lake in Oregon. Similar dark animals also occur in Alaska, and many therefore do not regard *T. g. mazamae* as valid. In the trade, *T. granulosa* and *T. torosa* are often mixed up, even though the care of the two species differs. The species can live 12-18 years.

Distribution and habitat

Taricha granulosa lives along the Pacific coast of North America, from south-eastern Alaska north to Juneau, through British Columbia, Washington and Oregon to Santa Cruz County south of San Francisco Bay in California. It is also found on many offshore islands, including Vancouver Island. East of the Cascade Mountains it is rare. Isolated populations in Idaho and Montana are probably descended from introduced animals.

> **Native range:** United States and Canada.

HABITAT

T. granulosa lives in forests and forest edges, where the animals hide under rotting logs, stones and leaf litter, and returns to the water to breed. Aquatic adults are found in ponds, lakes, pools in streams and slow stretches of creeks and rivers, and avoid strong current. The species occurs from sea level up to about 2700 m and in water down to 12 m deep.

The way of life varies greatly between populations. Many animals become aquatic in summer during dry periods, in some populations the males stay in the water all year, and some animals live their whole lives in water. High-altitude populations sometimes retain their gills as adults. Some populations are active by day, while others hide by day and are active at night. The newly metamorphosed young leave the water and do not return until several years later.

Care

THE ENCLOSURE

Taricha granulosa is the most aquatic species in the genus. The animals alternate between land and water, some for months or years at a time, but from about one year of age they can be kept in water all year round. The setup is therefore an aquaterrarium with deep water and a place where the animals can easily climb out. A pair of adults needs at least 60 × 30 × 40 cm, and in the same footprint four half-grown animals of about 12 cm can also be kept.

The water must be 20-30 cm deep, and preferably deeper. Floating bark, cork islands, stones or roots that break the water surface give the animals a chance to get out of the water. Dense planting with ordinary aquatic plants is necessary: it provides cover, and the female uses it for egg-laying. The bottom in the water must be bare or covered with large stones, as gravel and small stones can be swallowed. The animals are good at escaping, so the lid must be secure.

The animals are peaceful towards each other, even when fed, and they do not poison each other. Keep the species on its own: other animals that try to eat it can die from the toxin.

TEMPERATURE

Taricha granulosa loves cool conditions. In summer, water and air are kept at 18-21 °C. If it gets warmer, towards 24 °C, the animals move up onto land; prolonged periods above 21 °C should be avoided. The night temperature is not documented; a drop of 2-4 °C suits the species.

In winter the temperature is lowered to 5-12 °C. The cool winter is necessary for the animals to breed the following spring. Young animals can be kept at room temperature the first winter, so that they grow faster. Place the tank somewhere cool, out of direct sun and without heat lamps.

HUMIDITY AND MISTING

The land section and the hides above the water must be damp, but not soaking. Humidity has not been measured for the species; an aquaterrarium with a lid and damp hides gives around 80-95 %. Good ventilation prevents skin infections.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water must be 20-30 cm deep, and deeper water does no harm: it is almost impossible to give the species water that is too deep in an ordinary tank. A run-in filter with gentle flow keeps the water clean, as the species lives in still or slow-flowing water. Use tap water treated against chlorine and chloramine; distilled and demineralised water is not used.

Check ammonia and nitrite, change part of the water regularly, and remove food remains so that the water is not polluted.

LIGHTING AND UVB

The species does not need UVB. Ordinary daylight in the room, or a weak fluorescent tube by day and darkness at night, is enough. The tank must not stand in direct sun, and heat lamps must be avoided.

Read more: Lighting and UVB

FEEDING

Taricha granulosa is an opportunistic predator. In the wild it eats amphipods, insects, snails, leeches, tadpoles and amphibian and fish eggs. In captivity it takes small crickets, earthworms, compost worms, waxworms, mealworms, mosquito larvae and frozen food, and the animals find their food as much by smell as by movement.

Relative to its size the species takes only small bites, so larger earthworms are cut into pieces. Fish food in the form of trout pellets is readily taken and is an easy staple diet, which produces many eggs. On land, give crickets, woodlice and similar feeder animals of a suitable size. Feed two to three times a week in the summer half of the year and less often in winter, and remove uneaten food from the water. Insects given on land are dusted with calcium and vitamins once or twice a week.

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

BEHAVIOUR AND HANDLING

Activity varies: some animals are out by day, while others hide under roots and stones and hunt at night. In the breeding season the male holds on to the female in amplexus, which can last from hours to several days. It looks violent, but the animals do not drown and come up for air together. Males also grab other males, other species, fish and objects such as airline tubing.

Handle the animal only when necessary, and wash your hands afterwards.

Breeding

SEXUAL MATURITY AND SEXING

The animals become sexually mature after 4-5 years in the wild. In captivity it often happens faster, because they are given plenty of food. The sexes are most easily told apart in the breeding season: the male has a broader tail, a swollen vent with a dark stripe, horny pads on the hind legs and toes, and a flatter belly than the female.

MATING

In the wild the species breeds in all months except November. Lowland populations breed from February to May, highland populations from late spring to early autumn. In captivity mating begins when the water is warmed up again after the winter rest, and sometimes again in autumn.

The male grasps the female from above, rubs her head with his chin and strokes her belly and sides with his hind legs. The amplexus can last from hours to several days. Finally he lets go, deposits a sperm packet and leads the female to it, so that she can pick it up with her vent.

EGGS AND LARVAE

The female begins laying eggs some weeks after mating. She lays the eggs singly and attaches them to aquatic plants, roots, branches and stones, often just below the surface. Egg-laying extends over several weeks and can be triggered by cooling the water with a water change. The eggs are poisonous, like the adults. The number of eggs per season is not documented. The figure in the box is borrowed from *Taricha torosa*, where an egg mass holds 7-30 eggs, and does not say how many eggs a female lays in total.

The adults eat the eggs, so they are removed together with the plant or stone they are attached to. Fungus on the eggs is rare. The larvae are kept in small groups in 5 cm of water or in a tank with a normal water level and an air stone, without too many animals. They are predators and are first given the smallest live food, later daphnia and red, white and black mosquito larvae. There is no parental care.

METAMORPHOSIS

The eggs hatch after 3-6 weeks, depending on the temperature. In captivity the larvae metamorphose after 2-4 months at a length of about 5 cm; in the wild it takes 4-5 months, and in high-altitude populations the larvae overwinter and do not metamorphose until the following spring or summer. The gills shrink and the skin changes texture. Stand the container at a slant, so that a ramp forms and the young can climb onto land.

REARING THE YOUNG

The newly metamorphosed young are kept on land, in a clean container on damp kitchen roll or in a terrarium with moss, with hides under bark and stones. Give small feeder animals such as woodlice and small crickets, and keep the substrate damp and cool. After about a year the young can be accustomed to living in water; the water must be shallow at first, so that they do not drown.

Health and common mistakes

The species is hardy, but these problems are common:

- Water that is too warm: above 21 °C for a prolonged period is stressful.
- Poor water quality: ammonia and nitrite require a run-in filter and regular water changes.
- Obesity in adults, because the species eats everything: feed moderately.
- Swallowed gravel or small stones can cause constipation and intestinal obstruction.
- Drying out of the land section: keep it damp.
- Skin infections from poor ventilation.

The species' toxin is deadly if the animal is swallowed. Keep the newt out of reach of children and pets, wash your hands thoroughly after any contact with the animal, water or furnishings, and do not touch your eyes or mouth until your hands have been washed.

Salamanders can carry the fungal disease Bsal (*Batrachochytrium salamandrivorans*), which is fatal to many species. Quarantine new animals for at least 60 days, and wash hands and equipment between containers.

See a vet with amphibian expertise if the animal refuses food for a prolonged period, has open sores or leans to one side when swimming.

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.