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SALAMANDERS AND NEWTS

Anderson's Crocodile Newt

Echinotriton andersoni

Echinotriton andersoni is a compact, dark brown to black salamander, 14-21 cm long, from the central Ryukyu Islands of Japan. It lives mostly on land in damp forest, has knob-like warts along its sides and can push the tips of its ribs out through the skin as a defence. The species is rare and little known in captivity.

Family: Salamandridae Former name: *Pleurodeles andersoni; Tylototriton andersoni* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**14-21 cm** total length incl. tail
Lifespan	**10-20 years**
Active	**At dusk and at night**
Lifestyle	**Terrestrial**
Habitat	**Dry forest and wetland**
Skin toxins	**Mild** Wash your hands after contact and keep your fingers away from your eyes and mouth
Difficulty	**Experienced**

CARE

Min. enclosure	**60 × 40 × 40 cm** L × W × H for 3 adults
Temperature, day	**18-25 °C**
Temperature, night	**15-20 °C**
Humidity	**60-80%**
Water	**Water section** depth 10-20 cm
UVB	**Not required**
Diet	**Insects and worms/snails**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**On the ground**
Eggs per season	**3-46**
Hatching	**20-27 days**
Larval period	**70-100 days** from hatching to metamorphosis
Larval diet	**Other larvae and small aquatic invertebrates (daphnia, mosquito larvae)**
Parental care	**None**

PROTECTION AND PAPERWORK

CITES	**Appendix III**
EU annex	**Annex C**
IUCN	**Vulnerable (VU)**

About the species

Echinotriton andersoni is a broad, flattened salamander with an angular, triangular head. Adults measure 14-21 cm including the tail, and the head and body are 7-10 cm. The back and belly are uniformly dark brown to black or reddish brown. Along the sides there are 12-15 distinct, knob-like glandular warts, and the spine shows as a ridge. The soles of the feet, the vent area and the lower edge of the tail are yellow to orange. The tail is usually shorter than the body.

The species is a close relative of *Tylototriton verrucosus* and *Tylototriton shanjing*, but lives far more on land than these. Since 2022 the populations on the Amami Islands and Tokunoshima have been regarded as a separate species, *Echinotriton raffaellii*. *E. andersoni* in the strict sense is therefore the population on the Okinawa Islands. Older literature does not distinguish between the two, and neither do animals in the trade, always.

The glands along the sides produce tetrodotoxin. When the animal is attacked, it raises its ribs so that the sharp ends push out through the skin and the glands and can pierce the predator. With ordinary skin contact the animal is not dangerous to humans, but the secretion irritates mucous membranes, and the rib tips can puncture. Do not pick the animal up, do not squeeze it, and wash your hands before and after any contact.

Distribution and habitat

Echinotriton andersoni occurs on Okinawajima and the smaller islands of Sesoko and Tokashiki in the Okinawa group in Japan. The species was formerly also found on Mount Guanyin in northern Taiwan, but has disappeared from there. Records from the Amami Islands and Tokunoshima have belonged to *Echinotriton raffaellii* since 2022.

The species is rare, and the population has declined as a result of habitat loss, collection for the pet trade and introduced mongooses. Roads with drainage gutters kill many animals.

> **Native range:** Japan.

HABITAT

The habitat is evergreen broadleaf forest, secondary forest, grassland and marshy areas, including in and around sugar cane fields. Outside the breeding season the animals live hidden in leaf litter, in rock crevices and under stones and logs and are difficult to find. The diet consists of ground-dwelling invertebrates such as beetles, woodlice, earthworms, snails, spiders and millipedes.

Mating takes place on land. The male deposits spermatophores on the ground, and the female can store the sperm in her cloaca for up to four months. The breeding season is February to July, peaking in March-April. The female lays the eggs on land, no more than one to two metres from still water such as ponds and pools, in humus or under leaves and small stones. The larvae hatch and crawl or jump to the water.

Care

THE ENCLOSURE

Little is known about the care of *Echinotriton andersoni*. The set-up and the figures for temperature, humidity and breeding are based on laboratory breeding of the species in the broad sense, including populations now regarded as *Echinotriton raffaellii*. Lifespan and night temperature are borrowed from *Tylototriton verrucosus* and *Tylototriton shanjing*, which have similar requirements.

The species lives mostly on land and is kept in a terrarium of at least 60 × 40 × 40 cm for 2-3 animals. A larger group needs more floor area, for example 90 × 90 × 50 cm.

The substrate is a thick layer of damp leaf litter and soil, preferably 70 parts leaf litter to 30 parts soil, so the animals can burrow and hide. Provide bark, cork and flat stones as hiding places. At one end a water area is made with a gently sloping bank, so the animals can easily get in and out, and so the female can lay eggs on the slope. Keep the lid tight.

Read more: Humidity, misting and ventilation

TEMPERATURE

The temperature is 18-25 °C by day and may fall to 15-20 °C at night. It should not stay above 25 °C for long. Heat lamps are unnecessary; keep the terrarium cool in summer and out of direct sun. Winter rest is not documented.

HUMIDITY AND MISTING

Humidity should be 60-80%. The leaf litter and soil are kept damp but not wet, and part of the substrate should be drier so the animals can choose. Provide a little air exchange so the air does not stand still.

WATER AND WATER QUALITY

The water area is a bowl-shaped depression, about 30 cm in diameter and 10-20 cm deep in the middle, with an even slope all the way round, so the animals are never at risk of drowning. Use dechlorinated tap water or rainwater, and change the water regularly; a weak, constant inflow of fresh water keeps it clean. Amphibians absorb substances through the skin, so avoid soap, cleaning products and hand cream near them, and rinse your hands in clean water before touching the animals. The larvae are raised in a separate aquarium.

LIGHTING AND UVB

The species lives hidden and is most active at dusk and at night. UVB is not necessary. A light period of about 10 hours is suitable, and the light must also be sufficient to keep the plants alive. Avoid direct sun.

Read more: Lighting and UVB

FEEDING

The animals take earthworms, crickets, snails, woodlice and small beetles. Earthworms and crickets are suitable as the staple, and the feeder insects must be small enough for the animal to swallow whole. Feed 2-3 times a week and give as much as the animals eat in half an hour. Feeder insects are dusted occasionally with calcium and vitamins. The larvae are predators and are fed live tubifex and other small aquatic life such as daphnia and bloodworms.

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

BEHAVIOUR AND HANDLING

The animal lives hidden and is most visible at dusk and at night. Groups need plenty of hiding places. The animal is not suited to handling. If it must be moved all the same, use wet, clean hands or a soft tray, and do not squeeze it. When threatened it raises its ribs and arches its back.

Breeding

SEXUAL MATURITY AND SEXING

Sex differences and age at sexual maturity are not documented. Three-year-old animals are 8-9 cm long. The male is recognised in the breeding season by a swollen cloaca.

MATING

The animals mate on land in spring with no stimulus other than a stable, damp set-up with a water area. The male crawls around the female, draws mucus threads out of the cloaca and deposits a spermatophore by rubbing the cloaca against the ground while swaying his body. The female picks up the spermatophore and can store the sperm for several months. The breeding season is February-June.

EGGS AND LARVAE

The female lays the eggs on land in leaf litter and damp soil on the slope down to the water area, close to the water but not in it. The eggs are greyish and 3 mm in size, and a clutch is 3-46 eggs. Eggs on land do better than eggs under water, but eggs in dry substrate die, so the substrate must be kept constantly damp. The eggs can be left where they are or carefully moved to a damp tray at 18-25 °C. Keep them almost free of water until the tail begins to show in the egg, then raise the water level little by little towards hatching.

The larvae are predators and also eat each other, even when only a few are together. Keep no more than two larvae in each container, preferably one, in shallow, clean water at about 20 °C, and feed live tubifex.

METAMORPHOSIS

The eggs hatch after 20-27 days. The larvae hatch on land and crawl or jump into the water themselves, or they are moved to shallow, cool water at about 20 °C. Metamorphosis takes place 2-3 months after hatching, 3-4 months after egg laying. The larvae lose their gills and go onto land, and now they must be able to get out of the water easily.

Read more: Rearing tadpoles

REARING THE YOUNG

Newly metamorphosed young are kept in a damp tray with wet sponge or leaf litter at about 22 °C and fed small crickets and earthworms. Mortality is highest at hatching and around metamorphosis, when fungal skin infections are a frequent cause. From one year of age the young are kept like the adults.

Health and common mistakes

Typical problems and mistakes:

- Too high a temperature for a prolonged period.
- Too dry a substrate, which dries out animals and eggs.

- Poor water quality in the larvae's container.
- Fungal skin infections around metamorphosis: they can be treated if detected early, so keep a close eye on the larvae during this period.
- Cannibalism among the larvae: keep them singly or in twos.
- Drowning in water that is too deep without easy access to land.
- Bsal (*Batrachochytrium salamandrivorans*) is a skin fungus that kills many European salamanders. Many East Asian salamanders can carry the infection without symptoms. New animals should therefore be quarantined for several weeks, separate from other salamanders and amphibians, with their own equipment and good hand hygiene.

See a vet with expertise in amphibians if the animal stops eating or develops sores, swellings or discoloured skin.

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.