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SALAMANDERS AND NEWTS

Guizhou Crocodile Newt

Tylototriton kweichowensis

Tylototriton kweichowensis is a robust, blackish-brown crocodile newt of 15-21 cm with three broad orange to reddish stripes along the body. It lives on land in the mountains of Guizhou and Yunnan and enters the water mainly to breed. It is best kept in a large enclosure with both land and water.

Family: Salamandridae Former name: *Pleurodeles kweichowensis* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**15-21 cm** total length incl. tail
Lifespan	**10-20 years**
Active	**At dusk and at night**
Lifestyle	**Terrestrial and semi-aquatic**
Habitat	**Montane forest and wetland**
Skin toxins	**Mild** Wash your hands after contact and keep your fingers away from your eyes and mouth
Difficulty	**Intermediate**

CARE

Min. enclosure	**90 × 45 × 45 cm** L × W × H for 3 adults
Temperature, day	**18-25 °C**
Temperature, night	**15-20 °C**
Humidity	**70-90%**
Water	**Aquaterrarium** depth 10-15 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 leaves over water**
Eggs per season	**50-150**
Clutches per year	**1**
Hatching	**10-12 days** at 25 °C
Larval period	**80-100 days** from hatching to metamorphosis
Larval diet	**Small aquatic invertebrates (daphnia, mosquito larvae)**
Parental care	**None**

PROTECTION AND PAPERWORK

CITES	**Appendix II**
EU annex	**Annex B**
IUCN	**Vulnerable (VU)**

About the species

Tylototriton kweichowensis is a large, heavily built crocodile newt. Adults measure 15-21 cm in total, but captive-bred animals are usually at the lower end. Females are slightly longer and broader than males. Lifespan has not been documented for the species; 10-20 years is borrowed from *Tylototriton verrucosus*. The ground colour is brown to black, and most animals have three broad orange to reddish stripes along the body: a sharply defined stripe down the middle of the back and two side stripes that are often broken into knobs or indistinct. The parotoid glands behind the eyes, the tail and the toe tips are usually orange or rusty red. The skin is rough and granular, and the head has strong bony ridges.

The species resembles several close relatives, especially *Tylototriton verrucosus*, *Tylototriton shanjing* and *Tylototriton yangi*. It is far more massive than *T. shanjing*, and the reddish colour does not extend onto the front of the head, as the orange does in *T. shanjing*. The range is large and the appearance varies from population to population, so without a known origin identification can be uncertain. Some animals in the hobby that were previously sold as *T. kweichowensis* have since been reassigned to *T. yangi*. The species was described in 1932, and the older genus name *Pleurodeles* can still be found in old sources.

The skin glands secrete a substance that can harm or kill a predator that bites the animal. In the closely related *T. verrucosus* the toxin consists mostly of proteins, and the blunt tips of the ribs press the secretion out of the warts without breaking through the skin; for *T. kweichowensis* the toxin has not been studied. For humans the secretion is not dangerous through ordinary skin contact, but it irritates the mucous membranes of the eyes and mouth. Wash your hands before and after any contact.

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

Distribution and habitat

Tylototriton kweichowensis occurs only in China, in western Guizhou and north-eastern Yunnan. The species is known from the counties of Bijie, Dafang, Hezhang, Nayong, Shuicheng, Weining and Zhijin in Guizhou and Yiliang and Yongshan in Yunnan. The area lies on the plateau in south-western China at 1,400-2,400 m elevation.

> **Native range:** China.

HABITAT

Tylototriton kweichowensis spends most of the year on land on damp, shaded grassy slopes with dense vegetation and many hiding places, and enters the water mainly in the breeding season from early May to early July, coinciding with the rainy season. The breeding waters are small ponds and slow-flowing streams, usually with aquatic plants and less than a metre deep. Its food consists of worms, insects, larvae and smaller salamanders, and the species can also swallow small frogs and toads.

Care

THE ENCLOSURE

Tylototriton kweichowensis needs a large enclosure, because the animals are big and heavy, need a solid land area with a hiding place for each animal, and need enough water for both larvae and a filter. For a breeding group of 3 adults, 90 × 45 × 45 cm is suitable, with roughly half land and half water. Plant both the land and the water section if you like.

The land is made of damp but not wet soil without fertiliser or perlite, mixed with coconut fibre and moss, in a layer of 5-8 cm over a drainage layer, with cork bark, roots and stones as hiding places. Crocodile newts are clumsy, and drowning is a real risk: the water section must have an even ramp or a broad, easily accessible edge, and pots, large stones and roots in the water must not be able to trap an animal underwater. Fit the enclosure with a mesh lid.

The animals can also breed in a water-rich set-up with floating cork bark, but they use the water far more when they have proper land to climb onto.

Juveniles are fully terrestrial and are kept in a damp but not wet enclosure with soil or kitchen paper as substrate and only a shallow water bowl.

Read more: Terrarium construction and bioactive substrate

TEMPERATURE

The species thrives at ordinary room temperature: 18-25 °C by day and 15-20 °C at night. In summer the day may well be at the high end, and in winter the animals are kept at 15-20 °C around the clock. The temperature must not stay above 26 °C for any length of time. A clear difference between summer and winter prepares the animals for the breeding season; the length of the cool period is not documented. The animals do not need a basking spot. Place the enclosure out of direct sun.

Read more: Heat and temperature

HUMIDITY AND MISTING

Humidity must be high, but the substrate not wet; 70-90 % is an estimate. Keep the land section damp without letting it turn to mud, and part of the substrate may well be drier. Mist lightly as needed, and ensure good ventilation so the air does not stand still.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water section takes up roughly half of the enclosure. The depth is not documented for the species; 10-15 cm is borrowed from *Tylototriton verrucosus*. Use dechlorinated tap water and a quiet filter that does not create a strong current. Change 20-30 % of the water every other week, and more often when there is uneaten food. Give the animals a free choice: most spend most of their time on land, but some use the water all year round.

Amphibians have very permeable skin, so avoid soap, cleaning agents and hand cream near the water.

LIGHTING AND UVB

UVB is not necessary, and the species is most active at dusk and at night. The lighting is for the plants, and the day length may well follow the seasons, longest in summer and shorter in winter, since it probably helps to control the breeding season. Do not place the enclosure in direct sun.

Read more: Lighting and UVB

FEEDING

Adults are fed chopped earthworms, crickets and other prey of suitable size. Waxworms and other fatty larvae are popular, but should not be a staple. With a varied diet, vitamin and mineral supplements are normally not necessary.

The species should be fed fairly often; feeding every other day keeps the animals in good condition for breeding. Feeding by hand or with tweezers is the surest way to see that all animals eat. The animals are slow, and the food must be held in front of them for many seconds; some are shy and need even more patience. If the group is allowed to feed on its own, shy animals risk starving, and it may be necessary to feed them separately. On land, pieces of earthworm can be placed on a piece of kitchen paper.

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

BEHAVIOUR AND HANDLING

The species is slow and clumsy. 2-3 animals can be kept together when there are enough hiding places for each animal. Handle the animals only when necessary, with clean, wet hands or powder-free gloves; the secretion of the skin glands and the animals' permeable skin are both reasons for caution.

Breeding

SEXUAL MATURITY AND SEXING

The male has a slit-shaped vent, the female a round, cone-shaped one. In juveniles the sex can usually be determined from about one year of age; if it is not clear from the outside, the vent can be gently opened so that its shape can be seen. Females are on average slightly larger and heavier. Age at sexual maturity is not documented for the species; the young live on land for about three years before they are moved to a set-up with water.

MATING

Breeding is encouraged by a large enclosure with both land and water, plants at the water's edge for egg-laying, plentiful food all year round (not only in the run-up to the breeding season) and a difference between summer and winter temperatures. Day length probably also plays a role. In the wild the breeding season is May-July; in captivity eggs are laid from March to June. A large water change in spring or early summer can trigger breeding, but the effect is uncertain.

During courtship the animals circle face to face in the water, and the male deposits a spermatophore, which the female picks up with her vent. If courtship or spermatophores are seen in the enclosure, the eggs usually follow within a few days.

EGGS AND LARVAE

The female lays one large clutch a year, spread over 1-3 days, normally 50-150 eggs in the season. The eggs are preferably laid at the transition between land and water, often on plants just above the waterline, and should be removed quickly from the adults' enclosure and placed fully in water, otherwise they dry out. They sit loosely and can be gently lifted off plants or

substrate with the fingers or a small spoon. Eggs laid in the water or that fall in are scooped up. The hatching rate varies widely, from 50 to 80 %.

The larvae are larger than in most other aquatic newts and grow astonishingly fast. From about 25 mm they need large amounts of food. From then on they are easy to wean from live food such as daphnia to frozen bloodworms and finely chopped earthworms. Underfeeding produces larvae that float, and after a few days with too little food they may be too weak to recover. Large water changes are necessary, because the larvae are big and have a high metabolism. The size difference between the largest and smallest larvae is great; the smallest do poorly, even when separated and fed well, and often die before or after metamorphosis.

Read more: Rearing tadpoles

METAMORPHOSIS

The incubation time is not documented for the species; 10-12 days at 25 °C is borrowed from *T. verrucosus*. The larvae metamorphose after about three months and then look like small adults. When the gills shrink, the water must be shallow and the larvae must be able to climb easily onto land. After metamorphosis the young live on land.

Read more: Incubating eggs

REARING THE YOUNG

The newly metamorphosed young are fairly large and can take small crickets or chopped earthworms from tweezers; teaching them this takes patience, but is recommended. The enclosure is damp but not wet, with soil or kitchen paper on the bottom, many hiding places and a shallow water bowl. Offer larger crickets, chopped earthworms and small larvae such as fly larvae as the young grow, and sort them by size. The young live on land for about three years and can then be moved to an enclosure with both land and water.

Health and common mistakes

Typical problems and mistakes:

- Drowning. Crocodile newts can become trapped under pots or stones in the water. The water section must have an easy ramp up onto land.
- Bacterial skin infection. The skin of a healthy animal is dry when it is out of the water; wet patches that do not dry and open sores suggest infection.
- Underfeeding, especially of shy animals and larvae. Make sure that every animal eats.
- Ammonia and nitrite in the water from uneaten food. Change the water, and feed smaller amounts more often.
- Excessive temperature over longer periods.
- Bsal (*Batrachochytrium salamandrivorans*) is a skin fungus that kills many European salamanders. It probably originates in East Asia, and many East Asian salamanders tolerate the infection and can carry it; it has been found in wild *Tylototriton verrucosus* and several other species in the genus. The genus is not resistant as a whole, however: *Tylototriton wenxianensis* can die of the disease. New animals are therefore quarantined for several weeks, kept apart from other salamanders and amphibians, with their own equipment and good hand hygiene.

Sick animals must be taken to 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.