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SALAMANDERS AND NEWTS

Bosca's newt

Lissotriton boscai

Lissotriton boscai is a small, mostly aquatic newt of 7-9 cm from Portugal and western Spain. It is brownish to greenish with dark spots and an orange belly, and in the breeding season the male develops a coloured protuberance on the tip of the tail instead of a crest. The species is cool-loving and adaptable and thrives in a cool aquaterrarium.

Family: Salamandridae Former name: *Triturus boscai* **Mild skin toxins**

KEY FACTS

THE ANIMAL

Adult size	**7-9 cm** total length incl. tail
Lifespan	**4-12 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	**Intermediate**

CARE

Min. enclosure	**60 × 30 × 30 cm** L × W × H for 4 adults
Temperature, day	**12-20 °C**
Temperature, night	**8-15 °C**
Humidity	**80-100%**
Water	**Aquaterrarium** depth 10-20 cm
UVB	**Not required**
Winter rest	**6-10 °C** 6-8 weeks
Diet	**Insects, small invertebrates (springtails, fruit flies) and worms/snails**
Kept	**In pairs or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**In water**
Sexually mature	**24-36 months**
Eggs per season	**150-440**
Hatching	**8-28 days**
Larval period	**45-105 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

Lissotriton boscai is a small newt. Females grow to 9 cm, males to 8 cm. The body is brownish, yellowish-brown or dull green with dark spots, and the belly is orange. Glandular ridges run along the back, and the skin is granular when the animal is out of the water. The species is not as showy in the breeding season as many of its relatives: the male develops no dorsal crest, but a coloured protuberance at the end of the tail.

The species was formerly placed in the genus *Triturus*. The skin has poison glands. The poison has not been measured in *L. boscai* itself, but the skin secretion of the genus *Lissotriton* can irritate mucous membranes. Wash your hands after handling. Lifespan, age at sexual maturity, egg numbers, incubation period, larval period and winter rest have not been measured in the species itself; the figures are borrowed from the closely related *Lissotriton helveticus*.

Read more: Incubating eggs

Distribution and habitat

Lissotriton boscai lives only on the Iberian Peninsula, in Portugal and western Spain, including Galicia. Populations are regarded as stable. Locally it declines when ponds are destroyed or degraded.

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

HABITAT

Lissotriton boscai is mostly aquatic and is found in shallow ponds and streams with dense vegetation. The species tolerates disturbed and artificial waters such as ditches and lives in oak woodland, scrub, sandy coastal strips and on farmland, including cork-oak landscapes. Predatory fish keep it out of a pond, and it is found less often in eucalyptus plantations.

Outside the breeding season the animals live partly in the water and partly on land under stones, wood and leaf litter nearby. The species breeds in the wet part of the year and is most often found in ponds with other populations nearby.

Care

THE ENCLOSURE

Lissotriton boscai is mostly aquatic, and an aquaterrarium suits it best. An enclosure of 60 × 30 × 30 cm holds up to 4 animals, and a larger one gives more peace. The water section takes up most of the floor, is 10-20 cm deep and is densely planted with fast-growing aquatic plants such as Canadian waterweed, hornwort and cabomba, which the female can fold her eggs into. The land section is a floating platform or an island of stone, cork and moss, so the animals can climb in and out themselves. The substrate is bare or fine sand, and hides of stone and roots give security.

The animals climb glass and squeeze through small gaps, so the enclosure needs a tight-fitting lid with ventilation. Newly metamorphosed young live on land and need an enclosure with a shallow water area where they cannot drown.

TEMPERATURE

Lissotriton boscai is cool-loving. The daytime temperature is 12-20 °C and the night-time temperature 8-15 °C. Temperatures above 22 °C for long periods should be avoided. Heating is not necessary; a water heater should not be used. Keep the enclosure cool, out of direct sun; in hot summers a fan over the water, a cooler or a cool room can help.

For breeding, about 15 °C suits after a cool period. A cool period of 6-8 weeks at 6-10 °C in water or in damp moss on land brings the animals into breeding condition.

HUMIDITY AND MISTING

The skin dries out quickly, so the humidity over the land section must be 80-100 %. Mist the land section with dechlorinated water once or twice a day, and let moss and soil hold the moisture without the substrate becoming sodden. Good ventilation prevents mould and stale air.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

The water section is 10-20 cm deep and 10-20 °C. Use dechlorinated tap water or rainwater; the chlorine must be gone, but water quality is otherwise not critical. A small filter with a gentle flow keeps the water clean and is optional; without a filter part of the water is changed regularly, and uneaten food is removed. The substrate is bare or fine sand with grains of no more than 1 mm, never gravel, which can be swallowed. Amphibians absorb substances through the skin, so soap, cleaning products and hand cream must be kept away from the water.

LIGHTING AND UVB

UVB is not necessary for the species, which lives hidden. Ordinary LED light for 10-12 hours a day gives the aquatic plants what they need, and more light and a higher temperature in spring help bring the animals into breeding condition. The lamp must not heat the water, and plants and hides provide shade.

Read more: Lighting and UVB

FEEDING

Lissotriton boscai eats any small animal it can swallow. In the water it is given daphnia, mosquito larvae, tubifex and small earthworms, and it also takes frozen food from the bottom. On land it is given fruit flies, springtails, small woodlice, aphids and small snails. Unmoving food is seldom taken on land, so land food must be live.

Adults are fed two to three times a week in small portions, and the food animals must be small, as the species is small. A varied diet makes supplements less important.

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

BEHAVIOUR AND HANDLING

The species is peaceful and can be kept in pairs or in a group with more females than males, so the females are left in peace in the breeding season. Animals of the same size and with the same temperature needs can be kept together, but not with larger salamanders, which eat them, and not with fish. Avoid handling; if an animal must be moved, use wet hands, a small net or a cup.

Breeding

SEXUAL MATURITY AND SEXING

In the breeding season the male is recognised by the coloured protuberance on the tip of the tail. Outside the breeding season the sexes are hard to tell apart, but females are larger than males, and juveniles cannot be sexed. The animals become sexually mature after 2-3 years. A pair, or a group with more females than males, ensures that the females are mated.

MATING

The breeding season is triggered by rising temperature and more light after a cool period. The animals are moved to the water section, or they stay in the water if they are aquatic. The ideal breeding water temperature is about 15 °C. The male takes up position in front of the female and displays with his tail, so that scent drifts towards her. If she is receptive, he deposits a spermatophore, which she takes up with her cloaca. Fertilisation is internal.

EGGS AND LARVAE

The female lays the eggs singly and folds each egg into a leaf of an aquatic plant over days to weeks. A female lays 150-440 eggs per season. Adults eat eggs and small larvae, so the eggs or the adults are moved to a separate tank. Fertile eggs are at first half white and half black, while infertile ones quickly turn white and opaque and are removed before they go mouldy.

The larvae hatch after 8-28 days, depending on temperature. For the first 2-3 days they live on the yolk and should not be disturbed. After that they are predators and will take only live food: first infusoria, newly hatched daphnia and artemia, later larger daphnia, mosquito larvae and white worms. They are fed daily, and the water is changed in small amounts, no more than 10-20 % at a time. The larvae are sorted by size so that they do not eat one another.

METAMORPHOSIS

The larvae metamorphose after 45-105 days, depending on temperature and food. When all four legs have developed, the gills recede and the juvenile colours appear. Lower the water level then to a few centimetres, and put out stones, cork or floating plants so that the metamorphosed animals can leave the water without drowning. The small young go onto land and are moved to a land enclosure.

REARING THE YOUNG

The newly metamorphosed young live on land for the first years. Keep them in a damp, cool enclosure with a layer of soil, turf or moss, bark and leaves. They are fed aphids, wingless fruit flies, springtails and small woodlice, and white worms can be put out in the soil. Keep the young sorted by size and apart from the adults. Sexually mature animals can be moved into an aquaterrarium.

Health and common mistakes

The main problems in care are:

- Heat: temperatures above 22 °C for a long time stress the animals, cause poor appetite and can lead to disease and death. Keep the enclosure cool.
- Drying out: the skin is delicate and dries out quickly if the land section is not kept damp.
- Fungal infections and skin sores, often after poor water quality or too many animals. Use clean, dechlorinated water, and change it regularly.
- Constipation: gravel can be swallowed. Use a bare floor or fine sand.
- Larvae floating belly-up because they have swallowed air, often through underfeeding or overcrowding. Place the larva in a dish with so little water that it cannot turn over, and give plenty of food until the air is gone.
- Infection that spreads through a group. Animals with swelling, lethargy, bleeding in the skin, swelling around the mouth or loss of appetite are moved to a separate tank at once. Ranavirus has caused mass mortality in *L. boscai* in the wild.

The fungus *Batrachochytrium salamandrivorans* (Bsal) is fatal to many salamanders, and *L. boscai* has lost animals both in experiments and during an outbreak in captivity. New animals are quarantined before they are put with others, each enclosure has its own equipment, and hands and tools are cleaned between enclosures. Animals, water and tools must never come into contact with wild amphibians. Captive-bred animals carry diseases and parasites less often than wild-caught ones. Consult a vet with knowledge of amphibians if an animal falls ill.

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

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.