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SALAMANDERS AND NEWTS

Western Tiger Salamander

Ambystoma mavortium

Ambystoma mavortium is a stout salamander, up to 30-35 cm long, from the prairies, forests and semi-deserts of North America, with yellow crossbars and blotches on a dark ground colour. The larvae live in water, while the adults spend most of their lives in self-dug burrows and emerge at night. Some animals never metamorphose and become sexually mature with their gills retained.

Family: Ambystomatidae

Mild skin toxins

KEY FACTS

THE ANIMAL

Adult size	**15-30 cm** total length incl. tail
Lifespan	**10-20 years**
Active	**At night**
Lifestyle	**Terrestrial and burrowing**
Habitat	**Semi-desert and temperate woodland and meadow**
Skin toxins	**Mild** Wash your hands after contact and keep your fingers away from your eyes and mouth
Difficulty	**Beginner**

CARE

Min. enclosure	**50 × 25 × 30 cm** L × W × H for 1 adult
Temperature, day	**18-22 °C**
Temperature, night	**16-20 °C**
Humidity	**80-95%**
Water	**Water dish**
UVB	**Not required**
Diet	**Insects, vertebrates and worms/snails**
Kept	**Singly or in pairs**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**In water**
Sexually mature	**5-36 months**
Eggs per season	**100-1,000**
Hatching	**19-50 days**
Larval period	**75-150 days** from hatching to metamorphosis
Larval diet	**Other larvae and 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

Ambystoma mavortium is a stout-bodied salamander with a broad head, short thick legs and a heavy tail. Adults that have metamorphosed are typically 15-30 cm long, tail included; a few can reach 35 cm. Animals that remain in larval form can reach 18-38 cm.

The back is grey, dark brown or black with crossbands and blotches in a muddy yellow. The pattern varies greatly across the range: *A. m. mavortium* has distinct yellow crossbands, *A. m. nebulosum* has a few small spots, *A. m. melanostictum* has a net-like pattern of thin dark lines on a paler ground, and *A. m. diaboli* is olive-brown with scattered dark spots. The subspecies grade into one another, and larvae have been released in many places, so an animal from the trade can rarely be assigned to a subspecies. The larvae have alternating dark and pale blotches on the back and pale stripes along the sides.

The species has two feeding forms: an ordinary one and a cannibal one with a broader head, a larger skull and an extra row of teeth in the palate. The cannibal form develops when larvae of different sizes are kept together. The male is larger than the female and has a longer, taller tail, and in the breeding season his cloaca is larger than hers. The species typically lives 10-20 years in captivity.

When threatened, the animal raises its tail, and the skin glands secrete a thick, white fluid meant to scare off predators. The secretion is toxic and can irritate mucous membranes, so wash your hands after handling. The toxin has been described in the closely related *A. tigrinum*.

A. mavortium was described by Baird in 1850. The species belongs to a complex of closely related species and subspecies in which *A. tigrinum* is the eastern one, and it was long treated as a subspecies of it. Several figures in this guide, including those for eggs, larval period and lifespan, are borrowed from *A. tigrinum* and from the complex as a whole.

Distribution and habitat

Ambystoma mavortium lives in western Canada (British Columbia, Alberta, Saskatchewan and Manitoba), in the western half of the USA and in northern Mexico. In the USA the range extends all the way to the southern tip of Texas, but no further east than the Dakotas and Oklahoma. The species is found only rarely in California and Nevada.

A few populations, including some in southern Arizona, descend from introduced larvae used as bait. *A. tigrinum*, the eastern species in the complex, lives east of that area.

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

HABITAT

A. mavortium is found in a wide range of habitats: deciduous and coniferous forest, open country, meadows, grasslands and semi-deserts, usually in sandy or loose soil. The animals mostly live close to the pools where they breed: ditches, slow streams, cattle tanks, marl pits, spring-fed ponds and high-altitude lakes. They generally avoid water with predatory fish.

The adults spend most of the year underground in self-dug burrows or in the burrows of other animals, and they have been found more than 60 cm down. This protects them against extreme heat and cold. After rain they migrate to the breeding ponds at night; the males arrive first. In dry periods the animals gather in heaps under cover or deep in the soil.

Care

THE ENCLOSURE

Adults can be kept in many kinds of container. The simplest is a large plastic box with a tight-fitting lid and many small ventilation holes; a glass terrarium with a mesh lid gives a better view. One adult needs a floor area of at least 50 × 25 cm, and two adults of the same size at least 75 × 30 cm. Floor area matters more than height. The lid must be secured, because the animal is strong and can push off a loose lid. The substrate must be at least 10 cm deep and moisture-retaining so that the animal can burrow.

Use damp topsoil without fertiliser or additives, coconut fibre, or a mixture of the two. Slope the substrate so that there is a damper and a drier side; the animal regulates its own moisture. Avoid peat and other acidic substrates: they can cause loss of salts from the body and, in the worst case, death. Cedar and pine bark and chips must not be used either, as the oils are toxic to amphibians. Remove droppings and uneaten food several times a week, and replace the substrate every 1-2 months or when it smells sour. Give at least one large hide per animal, for example half a pipe, a cork or root piece, or a flat stone. Damp, unbleached kitchen paper with crumpled pieces as hides is good for quarantine and for collecting faecal samples.

Do not use gravel or stones that the animal could swallow; decorative stones must be larger than the animal's head. Live plants get dug up, so use artificial ones. Larvae and neotenic animals are kept in a separate aquarium, as long and wide as possible, with a cycled filter, a hide for each animal and dividers between them. Allow no more than one large animal per 20 litres of water. Newly bought larvae are quarantined for 60 days.

Read more: Quarantine and hygiene

TEMPERATURE

The temperature should be 18-22 °C by day and preferably slightly lower at night, for both larvae and adults. The species tolerates cold better than heat. The larval tank is not heated, and the water must not exceed 24 °C. Above 25 °C for any length of time is life-threatening for adults. At cooler temperatures the animals eat less.

Place the container somewhere cool, out of direct sun and without heat lamps. The species has no fixed winter rest in captivity, but appetite often falls in winter, even at room temperature.

HUMIDITY AND MISTING

The substrate must be damp but never wet or muddy, because the animal absorbs water through its skin and does not drink through its mouth. Air humidity has not been measured for the species; a damp substrate gives roughly 80-95 %. A moisture gradient from a damp to a drier side lets the animal choose for itself. Mist the substrate with dechlorinated water or spring water when it looks dry. In dry rooms this may be necessary daily, in humid rooms only once a week.

Good ventilation is important: an overly wet, closed environment causes skin infections.

Read more: Humidity, misting and ventilation

WATER AND WATER QUALITY

A shallow, heavy water bowl is not essential, but it is a good safeguard: if the substrate becomes too dry, the animal seeks out the bowl, so it prevents deaths from desiccation. Adults are poor swimmers, so there must be no deep water in the set-up. Change the water every 3-4 days or when it is dirty.

Use tap water treated against chlorine and chloramine, or spring water; distilled and demineralised water must not be used. Water for larvae and neotenic animals must be treated in the same way, and the filter must be cycled before the animals go in, otherwise ammonia and nitrite rise, and both are toxic to amphibians. Check the values and change water daily until the filter is established. The water must not become warmer than 24 °C.

LIGHTING AND UVB

The species is nocturnal and needs no special lighting. There is no evidence that it needs UVB, and strong UV light can damage the eyes and skin of amphibians. Ordinary daylight in the room or a dim fluorescent tube by day and darkness at night give a good daily rhythm. The container must not stand in direct sun.

Read more: Lighting and UVB

FEEDING

Larvae and neotenic animals eat earthworms, compost worms, suitably sized crickets, waxworms and small fish. Small pieces of meat can be given as an occasional treat, but not as a staple, because meat lacks vitamins and minerals. Thawed frozen fish should not make up a large part of the diet, as it can cause thiamine deficiency. At 18-22 °C feed two to three times a week, until the animals stop chasing the food. Remove uneaten food so that the water does not become polluted.

Newly bought larvae that have been starved cannot cope with large meals. Give them small, frequent meals, for example pieces of earthworm, daily for several weeks, and then cut back to two to three times a week with larger portions.

Adults eat crickets, cockroaches, freshly moulted mealworms, earthworms, waxworm larvae and pinkie mice. Earthworms are the best staple, as they have a good calcium-to-phosphorus ratio. Crickets are low in calcium and must be gut-loaded or dusted with calcium and vitamins once or twice a week. Pinkie mice and waxworm larvae are fatty and are given only rarely. At around 22 °C feed adults two to three times a week; at 16 °C and below once a week is enough. Give as much as the animal can eat over several hours or overnight. Remove uneaten crickets after 24 hours, because they can bite and, in the worst case, kill the animal. Adults easily become overweight.

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

BEHAVIOUR AND HANDLING

Adults burrow and lie hidden for most of the day. They are nocturnal and active hunters that lie in wait. Many animals learn to recognise their keeper and beg for food. Outside the breeding season the species is solitary and does perfectly well alone. Two adults of the same size can share a container of at least 75 × 30 cm, but eager animals may nip each other's tails and toes at feeding. When threatened, the animal curls up and raises its tail towards the attacker.

The skin is thin and permeable, and salts and oils from the hands can damage it. Handle the animal as little as possible, with clean, wet hands, and wash your hands afterwards. Never keep larvae of different sizes together; the largest eats the smaller ones, and it is precisely that combination that triggers the cannibal morph.

Breeding

SEXUAL MATURITY AND SEXING

The animals become sexually mature after five months to three years, depending on temperature, food supply, water conditions, crowding and subspecies. Development is fastest in ponds that dry out early and slowest in cold, high-altitude lakes. The male is recognised by his longer, taller tail and, in the breeding season, a larger cloaca than the female's.

MATING

The breeding season varies between the subspecies, and egg-laying is seen in most months. In the wild the migration to the breeding ponds is triggered by rain; the trigger in captivity is poorly understood. The animals gather in large numbers in pools and breed together. The male pushes the female with his snout and moves under her chin, and she touches his tail and cloaca so that he deposits a spermatophore, which she picks up.

Terrestrial animals are very difficult to breed indoors. Neotenic, gilled adults can be bred in the same way as *A. mexicanum*, in cold water with plants to lay eggs on.

EGGS AND LARVAE

Egg-laying takes place at night, normally 24-48 hours after mating. The eggs are laid singly or in clumps on twigs, plants and the bottom of the water, and a clump can hold up to 100 eggs. A female lays 100-1000 eggs per season, spread over several clumps. The clumps are looser than in other species of the genus and break up easily. The eggs hatch after 19-50 days, depending on subspecies and water temperature.

The larvae are predators and need small, live aquatic animals such as daphnia, mosquito larvae and small crustaceans. There is no parental care. Keep larvae of uniform size together and sort them by size often to avoid cannibalism.

METAMORPHOSIS

The larvae stay in the water for 2.5-5 months before they metamorphose. Metamorphosis shows in that the gills become shorter and disappear, the fin on the tail becomes smaller and the tail becomes rounder. The adult colours appear and are fully developed after weeks to months.

When the signs appear, lower the water level and tilt the aquarium, or provide easy access to land. Feeding continues, because the gut does not change as it does in frogs, but some animals refuse food for a period. Take care that the shallow water does not become polluted by uneaten food. When metamorphosis is complete, move the animal to the adult set-up. Some animals never metamorphose and become gilled adults.

Read more: Rearing tadpoles

REARING THE YOUNG

Once metamorphosis is fully complete, move the newly metamorphosed young to an adult set-up with damp paper or a damp, peat-free substrate and hides. Give small food items such as small earthworms, small crickets and pieces of worm, and feed them more often than adults. Quantities and intervals for the young are not known.

Sort the young by size so that they do not eat each other. Keep the substrate damp and cool, not above 24 °C, and replace it more often than for adults.

Health and common mistakes

The species is hardy and forgiving of small mistakes, but these problems are common:

- Too warm: above 25 °C for any length of time can be life-threatening.
- Obesity in adults: feed moderately, and use pinkie mice and waxworm larvae only rarely.
- Starved, newly bought larvae given meals that are too large: can go into shock and die. Feed small, frequent meals.
- Biting between larvae: damage to gills and legs. Keep animals of uniform size together.
- Acidic substrate, such as peat: causes loss of salts. Avoid peat.

- Crickets without calcium supplement: can cause bone disease.
- Swallowed gravel or stones: can be fatal.
- Ammonia and nitrite in the larval tank: require a cycled filter and water changes.
- Desiccation: provide a water bowl and a damp substrate.

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 your hands and equipment between containers.

See a vet with amphibian expertise if the animal refuses food for a long time, has open sores or tilts to one side when swimming.

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.