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CAECILIANS

Koh Tao Caecilian

Ichthyophis kohtaoensis

Ichthyophis kohtaoensis is a burrowing caecilian from South-East Asia with a life in two parts: the adults live in damp soil, while the young hatch as aquatic larvae with external gills. The female lays the eggs in an earth burrow beside water and guards them. Little is known about the care of the species.

Family: Ichthyophiidae

KEY FACTS

THE ANIMAL

Adult size	**30-40 cm** total length incl. tail
Lifespan	**5-10 years**
Active	**At night**
Lifestyle	**Burrowing**
Habitat	**Dry forest and rainforest**
Skin toxins	**None known**
Difficulty	**Experienced**

CARE

Min. enclosure	**50 × 30 × 35 cm** L × W × H for 1 adult
Temperature, day	**23-25 °C**
Temperature, night	**21-23 °C**
Humidity	**90-100%**
Water	**No water dish**
UVB	**Not required**
Diet	**Worms/snails**
Kept	**Singly or in groups**

BREEDING

Reproduction	**Egg-laying**
Development	**Larvae in water**
Egg-laying site	**On the ground**
Eggs per season	**20-40**
Larval period	**120-240 days** from hatching to metamorphosis
Larval diet	**Small aquatic invertebrates (daphnia, mosquito larvae)**
Parental care	**Guards the eggs**

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Data Deficient (DD)**

About the species

Ichthyophis kohtaoensis is a slender amphibian with no limbs and a very short tail, resembling a large, glistening earthworm. The body is divided into many transverse rings, the eyes are small and lie under the skin, and on each side of the head sits a small tentacle, which the animal uses to smell and feel its way underground. Adults are medium-sized caecilians of about 30-40 cm; both length and lifespan are estimates, because they have not been measured for the species.

The species was described from the island of Koh Tao in the Gulf of Thailand. The mainland populations are often written *Ichthyophis* cf. *kohtaoensis*, because it has not been settled whether they all belong to the same species. The populations in southern China and northern Vietnam are treated as the closely related *Ichthyophis bannanicus*, which is however sometimes counted as *I. kohtaoensis*.

In contrast to the aquatic caecilians, the adults are terrestrial and burrowing, while the larvae live in water.

No skin toxicity has been described for the species. Like other amphibians it has glands in the skin, so wash your hands after handling, and do not touch your eyes and mouth.

Distribution and habitat

Ichthyophis kohtaoensis lives in Thailand, Cambodia, Laos, Myanmar and Vietnam and, if the populations there are included, in southern China. The species is known from Koh Tao and Koh Pha-ngan and from the mainland, including the Mekong valley in north-eastern Thailand.

The species is assessed as Data Deficient (IUCN: DD). It is rarely seen, because it lives hidden in the soil, and the density in surveyed areas is low: about 0.08 animals per m^2.

> **Native range:** Thailand, Cambodia, Laos, Myanmar (Burma) and Vietnam.

HABITAT

Ichthyophis kohtaoensis lives in open scrub, gallery forest and open secondary forest and in gardens, plantations and settlements near streams, ponds and marshes. The climate has a marked rainy and dry season. In the dry season the adults stay down in the soil; in the rainy season they also come up into leaf litter and rotting plants. The animals are nocturnal and are most often seen during and after rain, for example under stones and debris near water.

Breeding follows the rainy season. The female lays the eggs in an earth burrow close to a pond, stream or river, and the larvae live in water until they metamorphose towards the end of the dry season.

Care

THE ENCLOSURE

Little is known about the care of *Ichthyophis kohtaoensis*. The care advice is based on experience with burrowing caecilians of the same size that are kept in the same way, including *Geotrypetes seraphini*.

I. kohtaoensis is kept in a tight box of thick-walled plastic or an enclosure with a fixed lid and a deep substrate to dig in. An adult needs at least 50 × 30 × 35 cm, so that there is room for 20-30 cm of substrate and an air space above. The lid must fit tightly and have a weight on top: an animal that can reach the lid escapes through the smallest gap, and feeder worms also crawl out. Provide ventilation with small holes in the sides just below the rim, covered with fine mesh; there should be no holes in the lid.

The substrate is the most important decision. Unbleached paper fibre (unscented paper-based bedding) is well proven: it holds moisture, the worms live in it, and caecilians clearly prefer it to coconut fibre. Sterilised, unfertilised topsoil can also be used. Coconut fibre alone is not recommended: it is dusty, clings to the skin and has been found packed into a hard plug in the gut of dead animals. Replace the substrate every 4-5 months, or sooner if it becomes dirty, and check the animal at the same time.

Place a flat piece of heat-treated bark or wood on the surface. The animals like to lie just under it, and it makes it easy to check on them without digging. Live plants are not necessary.

TEMPERATURE

Keep 23-25 °C by day and 21-23 °C at night. The temperature must be stable and vary by no more than about 3 °C; rapid and large fluctuations are poorly tolerated. If the box stands in a room with an even temperature, heating is rarely needed. A heat mat under one end gives a temperature and humidity gradient that the animal can choose from; the substrate dries out a little over the heat, so keep an eye on the moisture. If the animal stays on the surface instead of burrowing, the temperature, moisture or substrate is wrong.

Read more: Heat and temperature Read more: Humidity, misting and ventilation

HUMIDITY AND MISTING

The substrate must be evenly damp, but not so wet that water can be squeezed out of a handful, and there must never be standing water at the bottom of the box. The air in the box is as good as saturated with moisture (90-100 %). Maintain moisture by misting and occasionally turning over the substrate, and preferably leave one end slightly drier than the other. Use bottled water, rainwater or tap water that has stood for a day.

WATER AND WATER QUALITY

The adults do not need a water bowl. They get water from the damp substrate and from condensation on the walls of the box, and a water bowl easily makes the substrate too wet. Water is only necessary for the larvae, which live in water from hatching to metamorphosis; see the section on breeding.

Read more: Rearing tadpoles

LIGHTING AND UVB

The species lives underground and does not need UVB or special lighting. A normal day-night rhythm in the room with 10-14 hours of light is enough. The box must not stand in direct sunlight.

Read more: Lighting and UVB

FEEDING

Earthworms are the main food and are taken by almost all terrestrial caecilians. Use small to medium earthworms, for example compost worms, and cut them into pieces for juveniles. Put 10-15 worms in the box every other week. In a damp paper substrate the worms live on without rotting.

The animal finds food with its sense of smell and its tentacles and is rarely seen eating. Dig through the substrate regularly: many worms left over mean overfeeding or an animal that is not eating. Count the worms in and out when an animal is new. The nutritional value of the worms is increased by sprinkling calcium and vitamin powder in their soil 4-6 days before feeding.

Read more: Calcium, vitamins and supplements

BEHAVIOUR AND HANDLING

Ichthyophis kohtaoensis lives hidden and spends almost all its time buried. If the animal lies on the surface a great deal, the substrate is too wet, too dry, too cold, too warm or chemically unpleasant, or else a hide is missing on the surface; in that case replace the substrate and check the temperature.

One animal per box makes it easy to follow weight and health and rules out conflicts. Several animals of the same species can also be kept together if you regularly check for bites and injuries, and this gives a better chance of young. The animal is nocturnal and prefers to come up in the dark. Handle the animal as little as possible and only with clean, wet hands free of cream or soap residue.

Breeding

SEXUAL MATURITY AND SEXING

Age and size at sexual maturity are not known for the species, and the sexes are not easy to tell apart externally. Large females lay more eggs and produce larger larvae than small females.

MATING

Mating and egg-laying follow the rainy season: females with eggs are found only in the rainy season, and egg-laying begins when the monsoon sets in. Fertilisation is internal, as in all caecilians. There is no known method for breeding in captivity; a period of clearly damper substrate can imitate the rainy season, but the effect has not been tested.

EGGS AND LARVAE

The female lays the eggs in an earth burrow close to water and lies coiled around them until they hatch; she loses weight during this period. The eggs have a large yolk. The number of eggs has not been recorded for the species; the 20-40 in the specification box is an estimate for the genus. The eggs must not be moved or allowed to dry out.

Eggs in early development are found at the beginning of the rainy season and eggs with well-developed embryos at the height of the rainy season, so development in the egg takes a couple of months. The larvae hatch with three pairs of external gills, lateral line organs and a tail fin and need water. They are predators and eat small aquatic animals.

METAMORPHOSIS

The larvae live in water until they metamorphose. Give them a shallow aquarium with clean, still water without strong flow, with hides and a low edge up to a damp land area. The larval period follows the seasons: the larvae hatch from the height of the rainy season to its end and metamorphose before the end of the dry season, after about 4-8 months.

At metamorphosis the larva loses the gills and the tail fin. After that the animal must be able to crawl out of the water and dig into damp substrate.

REARING THE YOUNG

Metamorphosed animals are moved to a box with damp substrate like the adults' and fed small worms or pieces of worm. Keep humidity high and the temperature stable. Rearing in captivity has not been described in more detail for the species.

Health and common mistakes

Illness is seen late in an animal that lives buried. The most important problems are:

- The animal lies on the surface: wrong moisture, temperature or substrate, or a missing hide. Correct the conditions.
- Plug in the gut: coconut fibre has been found packed together in the gut of dead animals. Use paper fibre or sterile soil.
- Skin problems: fungal and bacterial infections, often after dirty substrate or injuries. Requires a vet.
- Parasites: roundworms, tapeworms and single-celled parasites are common in captive caecilians. Have a faecal sample examined.
- Escape: the animal gets out through small gaps and dries out. Use a tight lid with a weight.

The chytrid fungus *Batrachochytrium dendrobatidis* (Bd) occurs in caecilians. New animals are quarantined and tested, and equipment and hands are washed between boxes. Keep a new animal for the first month in a small box where you can count worms in and out and see whether it eats. See a vet experienced with amphibians if the animal does not eat for several weeks, loses weight, develops lesions or stays on the surface.

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.