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AGAMAS

## Sulawesi Sailfin Lizard

# *Hydrosaurus microlophus*

*Hydrosaurus microlophus* is a large, semi-aquatic agamid from Sulawesi in Indonesia. The male has a crest on the nape and a tall sail on the tail, and the animal grows to more than a metre long. It basks on branches over the water and throws itself into it when threatened. The species needs a very large, warm and humid enclosure with a deep water section and strong UVB, and its care is based on experience with the genus.

Family: Agamidae  Former name: *Istiurus microlophus*

KEY FACTS

### THE ANIMAL

| | |
|---|---|
| Adult size | **60-120 cm**<br>total length incl. tail |
| Lifespan | **15-25 years** |
| Active | **By day** |
| Lifestyle | **Arboreal and semi-aquatic** |
| Habitat | **Rainforest and wetland** |
| Difficulty | **Expert** |

### CARE

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|---|---|
| Min. enclosure | **200 × 80 × 150 cm**<br>L × W × H for 1 adult |
| Temperature, day | **26-32 °C** |
| Basking spot | **35-45 °C** |
| Temperature, night | **24-27 °C** |
| Humidity | **75-90%** |
| Water | **Aquaterrarium**<br>depth 30-50 cm |
| UVB | **Essential**<br>Ferguson zone 3 |
| Diet | **Insects, fruit, plants and vertebrates** |
| Kept | **Singly, in pairs or one male with several females** |

### BREEDING

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|---|---|
| Reproduction | **Egg-laying** |
| Clutch size | **2-8 eggs** |
| Incubation | **60-75 days**<br>at 28-30 °C |

### PROTECTION AND PAPERWORK

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|---|---|
| CITES | **Not listed** |
| EU annex | **Not listed** |
| IUCN | **Not Evaluated (NE)** |

## About the species

*Hydrosaurus microlophus* is a powerful, laterally flattened agamid with a tall body, long tail and long toes. The head is black, often with a yellowish tone around the eyes, on the neck and in the throat region. The nuchal crest and the dorsal crest are continuous. On each side of the neck sits a group of enlarged, cone-shaped scales, and the male's flanks are dirty yellow with three groups of large, often black, triangularly arranged scales between the fore and hind limbs. The tail is black with irregular yellow markings, and the sail is dirty yellow to light brown with black stripes. Females are black with enlarged yellow scales, while young animals and some females are grey with whitish scales. Females have only a low crest and a low sail. The species name *microlophus* refers to the relatively small spines on the nape and back.

The species is large, and adults grow to more than 100 cm including the tail. Exact measurements for adults are not documented; the range of 60-120 cm in the fact box applies to the genus.

The genus *Hydrosaurus* has five species. Until 2020 all animals from Sulawesi were counted as *H. amboinensis*, but a review of the type specimens and of the animals' colours and scales showed that two species live on the island: *H. microlophus*, which was described as early as 1860 from the Makassar area, and *H. celebensis*. *H. amboinensis* is now restricted to the central Moluccas and New Guinea. Older literature and trade names therefore use *H. amboinensis* for animals that today belong to *H. microlophus*, so ask for the origin when buying.

It is a nervous, fast and powerful lizard that is not suited to handling. It needs a very large enclosure, high heat, high humidity, UVB and a large water section, and it can live 15-25 years in captivity. The species is only for experienced keepers with plenty of space.

Read more: Lighting and UVB Read more: Humidity, misting and ventilation

## Distribution and habitat

*Hydrosaurus microlophus* lives on Sulawesi in Indonesia. The type locality is Makassar in the south-west of the island. Sulawesi is the only known island where two species of the genus live, because *H. celebensis* also occurs there. Older maps showing *H. amboinensis* on Sulawesi now cover *H. microlophus* and *H. celebensis*. The exact distribution on the island is poorly known.

> **Native range:** Indonesia.

### HABITAT

*Hydrosaurus microlophus* lives in tropical lowlands by rivers and streams and along the coast. The species of the genus are diurnal and bask on branches that overhang the water. When threatened, they run down into the water, swim away and can stay on the bottom for a long time until the danger has passed.

The climate is warm and humid all year. Its way of life in the wild is little studied and is assumed to resemble that of the other species in the genus, which are omnivorous and eat shoots, leaves, flowers, fruit, insects and small animals.

## Care

### THE ENCLOSURE

Little is known about the care of *Hydrosaurus microlophus*. The figures in this section and the following ones are borrowed from the better-known species of the genus, especially *Hydrosaurus pustulatus* and *Hydrosaurus amboinensis*, which have the same size and lifestyle.

An adult needs an enclosure of at least 200 × 80 × 150 cm (length × width × height). The dimensions are large because the animal needs a water section covering up to two thirds of the floor, a land section and high basking spots, and because an adult easily grows to more than a metre long. It requires a custom-built enclosure or a converted room; standard commercial enclosures are too small. For a pair or a trio each dimension should be at least 60 cm larger. Young animals can live in about 120 × 50 × 70 cm with a smaller water section, but they quickly outgrow it.

Furnish with horizontal and sloping branches at least as thick as the animal's body, and with shelves along the walls at different heights. The branches must overhang the water so the animal can escape down into it. The water must be at least 30 cm deep so that it cushions the fall; in shallow water the animal can injure itself. Leave room on the land section for a food bowl and, if there are females, a laying site.

The substrate must tolerate high humidity without rotting: pure cypress mulch, other bark mixes for humidity-loving reptiles, or equal parts fertiliser-free soil, sand and moistened coconut fibre in a layer of a few centimetres. Cover all sides except the front, and fit a 30 cm high screen along the bottom of the front. This gives a sense of security and prevents the animal from rubbing its snout raw on the glass. The enclosure must be lockable, because the animal is fast and nervous.

### TEMPERATURE

Keep the air at 26-32 °C during the day. The basking spot above a favourite branch or a high shelf should have a surface temperature of 35-45 °C, measured with an infrared thermometer. Start at the low end of the range, and watch the animal: an animal that constantly seeks to get away from the basking spot or down into the water is too hot. At night the temperature drops to 24-27 °C.

Use halogen spotlights in ceramic fittings above the basking spot in the upper part of the enclosure, and put guards around them so the animal cannot touch the bulb. Ceramic heaters keep the warmth at night without giving light. Heat cables under the floor can help, but only if they are fitted according to the manufacturer's instructions, because burns and fire are a real risk. Use a thermostat on all heat sources, and measure with digital thermometers both at the basking spot and in the cool part.

The animal must always be able to move away from the heat, and it likes to cool off in the water.

Read more: Heat and temperature

### HUMIDITY AND WATER

The humidity should be 75-90 %. High humidity is essential for clean shedding, including on the crest, sail and toes. Mist the enclosure at least once a day, or use a fogger or rain system, and keep the substrate evenly damp. The large water section evaporates constantly and helps a great deal.

Moisture and heat make mould and bacteria grow. Provide ventilation both high and low, and replace the substrate when it turns sour or smells. Air that is too dry leaves old skin stuck on the crest, toes and tail.

### WATER AND WATER QUALITY

*Hydrosaurus microlophus* uses the water for swimming, escaping, cooling off and drinking. The water section must be large enough for the animal to dive and swim freely, and at least 30 cm deep; up to two thirds of the floor can be water. Make sure the animal can easily climb out again by way of stones, roots or a slope.

The animal defecates in the water and drinks from it, so the water must be changed daily, and the water section must be cleaned thoroughly at regular intervals. A powerful filter helps, but does not replace the water change. Use clean tap water at room temperature.

### LIGHTING AND UVB

The species is diurnal and basks, so it needs strong light and UVB. Use a powerful UVB tube (T5 HO, 10-12 %) in a reflective fitting covering a large part of the basking area. Ferguson zone 3 suits a diurnal species that basks in open terrain by streams; the zone has not been established for the species and is an estimate. Aim for a UV index of about 3-5 at the animal's back at the basking spot and lower in the shade, check with a UV meter, and replace the tube according to the manufacturer's instructions, typically every 12 months.

Mesh and glass reduce UVB, so mount the tube inside the enclosure with a guard around it, or over a coarse mesh. Keep 12 hours of light a day all year round, controlled by a timer. An extra daylight tube or an LED of 5,000-6,500 K gives a bright, natural enclosure.

### FEEDING

The genus is omnivorous, and the diet in the enclosure consists of plants and a moderate amount of animal food. Give plants every day, for example dandelion, nettle, clover, rocket, kale, Chinese cabbage, herbs and edible flowers, supplemented with grated carrot, peas, beans and pumpkin and a little fruit such as berries, melon and banana. Chop it finely for young animals, and leave the bowl out all day. Complete food for herbivorous lizards is a good addition.

Young animals get insects (crickets, cockroaches, grasshoppers, morio worms) and plants every day. Adults get insects a couple of times a week and occasionally a small mouse, prawns, freshwater crayfish or a cleaned fish. The insects must be well fed and dusted with calcium; give calcium with D3 and vitamins once a week, and extra calcium to females that are laying eggs. Too much animal food causes obesity. The animal readily takes food from tweezers, and this builds trust.

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

### BEHAVIOUR AND HANDLING

The species is nervous and shy. When threatened, it runs, often on its hind legs, down into the water and stays on the bottom until the danger has passed. In the enclosure a startled lizard throws itself at the glass and rubs its snout. Screening, many hiding places and quiet around the enclosure are therefore the most important things.

The animal becomes calmer with time, but it is not an animal for daily handling. Move slowly near the enclosure, and use hand-feeding to build trust. If the animal has to be moved, lift it calmly from below instead of chasing it around: a chased animal is stressed, and the long claws scratch. It wriggles and scratches, but rarely bites.

Two males cannot be kept together. A pair or a male with two females can be kept in a very large setup, but the animals must be able to be separated if stress or injuries arise. Like all reptiles, the animal can carry salmonella, so wash your hands after contact with the animal, enclosure and water.

Read more: Quarantine and hygiene

## Breeding

### SEXUAL MATURITY AND SEXING

Males have a larger head, a taller crest and a much taller tail sail than females, and they are about a third larger. In the female the sail is only a low fringe. Young animals cannot be sexed reliably; the sexes only become clearly visible when the animals are well over half grown.

The age at sexual maturity is not documented. Only breed fully grown animals in good condition; a female that is too young or too thin is worn out by laying.

### MATING

Little is known about mating in *Hydrosaurus microlophus*. The male displays with crest and sail, and what triggers mating in captivity is not documented.

A pair or a male with two females requires a very large enclosure with many hiding places, so the females can withdraw from the male. Watch the animals, and separate them if a female gets wounds or stops eating. Give the females extra calcium and plenty of food before and after mating.

### EGG-LAYING AND CLUTCHES

The species lays eggs. The female lays 2-8 eggs per clutch; the figure is known from *H. pustulatus* and *H. weberi*, not from the species itself. She normally lays one clutch per season. In the genus the female digs a shallow pit in the soil near the water, but above the flood line.

Give the female a laying box on the land section with moist, loose soil and sand, at least 30 cm deep, and cover it partly so she feels safe. Without a suitable site she can retain the eggs, and this can become life-threatening; contact a vet if she seems strained or fails to lay. Females can lay unfertilised eggs without a male.

### INCUBATION

Lift the eggs out carefully without turning them, and place them half buried in moist vermiculite or perlite (roughly equal parts material and water by weight) in a closed box. Keep the eggs at a steady 28-30 °C. They hatch after 60-75 days; the figure is an estimate based on *Hydrosaurus weberi*, where the incubation period is about 65 days.

Check the box regularly for mould, and remove eggs that go mouldy or collapse.

Read more: Incubating eggs

### REARING THE YOUNG

The young are independent from the first day. Put them in an enclosure of about 120 × 50 × 70 cm with branches, a small water section and many hiding places, and screen the sides so they do not rub their snouts. Without substrate the enclosure is easy to keep clean; humidity is kept up with misting and water.

Feed small insects dusted with calcium, and finely chopped plants, every day, and give UVB from the first day. The young grow quickly and must be moved to larger enclosures as they grow. Males become territorial, so separate the young when fights occur.

## Health and common mistakes

Most problems in *Hydrosaurus microlophus* are caused by husbandry: too little heat, too little UVB, air that is too dry or a one-sided diet. Typical problems are:

- Metabolic bone disease from too little UVB and calcium.
- Snout injuries when the animal runs into the glass. Screen the sides, and give quiet.
- Skin stuck on the crest, toes and tail in air that is too dry.
- Burns from heat lamps without guards and from heat cables.

- Injuries after jumping into water that is too shallow.
- Skin and mouth infections from dirty water or a wet, sour substrate.
- Obesity from too much animal food.
- Egg-laying problems in females without a suitable laying site.
- Internal worms and other parasites, especially in wild-caught animals. Quarantine new animals, and have a faecal sample examined.

A healthy animal has clear eyes, a plump body and tail and an intact crest and sail. It eats regularly, basks and seeks the water when startled. Reptiles hide illness for a long time, so contact a vet with reptile experience if the animal loses weight, does not eat, has sores or swellings or sits with its mouth open.

Read more: Common diseases and signs of illness 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.