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AGAMAS

Philippine Sailfin Lizard

Hydrosaurus pustulatus

Hydrosaurus pustulatus is a large, semi-aquatic agamid from the streams and coastal forests of the Philippines. The male bears a crest on the nape and a tall sail on the tail. It reaches 60-120 cm, basks on branches over the water and plunges into it when in danger. It needs a very large, warm and humid enclosure with a deep water section and powerful UVB.

Family: Agamidae Former name: *Istiturus pustulatus; Histiurus pustulosus*

KEY FACTS

THE ANIMAL

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

CARE

Min. enclosure	**200 × 80 × 150 cm** 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** depth 30-50 cm
UVB	**Essential** Ferguson zone 3
Diet	**Insects, fruit, plants and vertebrates**
Kept	**Singly, in pairs or one male with several females**

BREEDING

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

PROTECTION AND PAPERWORK

CITES	**Not listed**
EU annex	**Not listed**
IUCN	**Least Concern (LC)**

About the species

Hydrosaurus pustulatus is a powerful, laterally flattened agamid with a tall body, a long tail and long toes with flat skin flaps, which are distinct especially in the young. The male has a crest on the nape and a tall, upright sail on the front part of the tail, up to 6-7 cm high. The sail is used for display, as a rudder and fin in the water and for absorbing heat. The colours are darkly marbled in olive and brown, often with yellowish patches on the flanks and under the head. The species name *pustulatus* means "with many blisters" and probably refers to the yellow, enlarged scales on the back.

Adults typically reach 60-90 cm including the tail, and large males reach 105-120 cm. The females are about a third smaller and have only a low crest and a low sail. The male has almost black limbs and head, which take on a violet sheen in the breeding season.

The genus *Hydrosaurus* comprises five species. In 2020, *H. microlophus* and *H. celebensis* from Sulawesi were removed from synonymy with *H. amboinensis*; in addition, *H. weberi* is found on Halmahera and the neighbouring islands. *H. pustulatus* is the Philippine species. The species is the most sought after in the genus, but animals in the trade are mostly captive-bred or belong to other species in the genus, especially from Indonesia. Have the origin stated before you buy.

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

Distribution and habitat

Hydrosaurus pustulatus lives only in the Philippines, where it is known from a long series of islands, including Luzon, Polillo, Mindoro, Negros, Panay, Bohol, Cebu, Sibuyan, Dinagat, Camiguin Sur and Mindanao. It is absent from Palawan. The type locality is Luzon. Records outside the Philippines on the map are due to animals in captivity or misidentifications.

> **Native range:** Philippines.

HABITAT

Hydrosaurus pustulatus lives in the lowlands along rivers and streams in tropical forest, in coastal forest and mangroves and by rice paddies. It is active by day and spends most of the day basking on branches that hang out over the water. When in danger, it runs or jumps down into the water and swims away, and it can stay underwater for up to an hour.

The climate is warm and humid all year round. The female buries her eggs in shallow pits near the water, above the flood line, and the young hatch in the rainy season. The species is omnivorous and eats shoots, leaves, flowers, fruit, insects, crustaceans and small animals. In the wild it lives about 15 years.

Care

THE ENCLOSURE

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 reaches a metre in length. This requires a home-built enclosure or a dedicated room; the standard enclosures sold in shops are too small. A pair or a trio needs an enclosure that is at least 60 cm larger in each dimension. Young animals can live in around 120 × 50 × 70 cm with a smaller water section, but quickly outgrow it.

The species lives both in the trees and in the water and often jumps into the water from a great height. Therefore furnish with horizontal and slanted branches that are at least as thick as the animal's body, and with shelves along the walls at different heights. The branches must hang out over the water, so that the animal can flee down into it. The water must be at least 30 cm deep, so that it breaks the fall; in shallow water the animal can injure itself. Make 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 bark, other bark mixes for moisture-loving reptiles or equal parts unfertilised 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 at the bottom of the front. This gives security and prevents the animal from rubbing its snout raw against the glass. The enclosure must be lockable, because the animal is fast and nervous.

TEMPERATURE

Hydrosaurus pustulatus is a tropical species and needs a clear gradient. The air is kept at 26-32 °C by day, and 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 basking range and watch the animal: an animal that constantly seeks away from the basking spot or down into the water is too warm. At night the temperature falls to 24-27 °C.

Use halogen spotlights in ceramic fittings over the basking spot in the upper part of the enclosure, and put guards around them so that the animal cannot touch the bulb. Ceramic heaters retain heat at night and in the cold season without giving light. Heating cables under the substrate can help, but only if 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 readily cools off in the water.

Read more: Heat and temperature

HUMIDITY AND WATER

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

Moisture and warmth 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 pustulatus uses the water for swimming, fleeing, 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 get out again by way of rocks, 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 cleaned thoroughly at regular intervals. A powerful filter relieves the work, but does not replace the water change. Use clean tap water at room temperature.

LIGHTING AND UVB

Hydrosaurus pustulatus is active by day 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 at forest edges and along streams; the zone has not been established for the genus 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 dampen UVB, so mount the tube inside the enclosure with a guard around it, or over a coarse mesh. Provide 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

Hydrosaurus pustulatus is omnivorous. In the wild it eats shoots, leaves, flowers, fruit, insects, crustaceans and small vertebrates. In the enclosure, the diet consists of plants and a moderate amount of animal food.

Give plants every day, for example dandelion, stinging 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 juveniles, and leave the bowl out all day. Complete food for bearded dragons is a good addition.

Juveniles get insects (crickets, cockroaches, locusts, morio worms) every day or every other day 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 should be well fed and dusted with calcium; give calcium with D3 and vitamins once or twice a week, and extra calcium for females that lay eggs. Too much animal food leads to obesity. The animal readily takes food from tongs, and that builds trust.

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

BEHAVIOUR AND HANDLING

Hydrosaurus pustulatus is nervous and jumpy. When in danger, 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 frightened lizard throws itself at the glass and wears its snout. Screening, many hiding places and quiet around the enclosure are therefore the most important things.

The animal calms down 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. Once it has been lifted, it normally settles quickly. It twists 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 set-up, 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, the enclosure and the water.

Read more: Quarantine and hygiene

Breeding

SEXUAL MATURITY AND SEXING

The males of *Hydrosaurus pustulatus* have a larger head, a taller crest and a much taller tail sail than the 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 thin is worn down by egg laying.

MATING

Little is known about mating in *Hydrosaurus pustulatus*. The male displays with crest and sail and takes on stronger colours in the breeding season. In the wild, the young hatch in the rainy season. 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 that 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 female lays 2-8 eggs per clutch. She normally lays one clutch per season, in good years several. In the wild, she digs a shallow pit in the soil near the water, but above the flood line.

Provide the female with a laying box on the land section with moist, loose soil and sand, at least 30 cm deep, and cover it partly so that she feels secure. Without a suitable site she can retain the eggs, and that can become life-threatening; contact a vet if she seems strained or does not manage to lay. Females can lay infertile eggs without a male.

INCUBATION

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

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

Read more: Incubating eggs

REARING THE YOUNG

The hatchlings are independent from the first day and can run across the surface of the water on their flat toes. 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 that they do not wear their snouts. Without a substrate the enclosure is easy to keep clean; the humidity is maintained with misting and water.

Feed every day with small insects, dusted with calcium, and finely chopped plants, and provide UVB from day one. The hatchlings grow fast and must be moved to larger enclosures as they grow. Males become territorial, so divide the young when fighting arises.

Health and common mistakes

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

- Brittle bones (metabolic bone disease) with too little UVB and calcium.
- Snout injuries when the animal runs into the glass. Screen the sides, and give peace.
- Skin stuck on the crest, toes and tail when the air is too dry.
- Burns from heat lamps without guards and from heating cables.

- Injuries after jumping into water that is too shallow.
- Skin and mouth infections with dirty water or a wet, sour substrate.
- Obesity with too much animal food.
- Egg-laying problems in females without a suitable laying site.
- Intestinal 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 full body and tail and an intact crest and sail. It eats regularly, basks and seeks the water when frightened. Reptiles hide illness for a long time, so contact a vet experienced with reptiles if the animal loses weight, does not eat, has wounds or swellings, or sits with its mouth open.

Read more: Common diseases and signs of illness

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.