Keeping of Philippine sailfin lizard (*Hydrosaurus pustulatus* (Eschscholtz, 1829)) at BION Terrarium Center

Ivan Neizhko[1], Oleksii Marushchak[2]

[1] – Senior Keeper**,** BION Terrarium Center, Kyiv, Ukraine

[2] – Head, Research and Development Department, BION Terrarium Center, Kyiv, Ukraine

The Philippine sailfin dragon *Hydrosaurus pustulatus* (Eschscholtz, 1829) (sailfin water lizard, crested lizard, soa-soa water lizard, *ibid*) is an endemic oviparous lizard inhabiting the Philippines, except Palawan Island (Fig. 1). Currently 5 different species are recognized within the Southeast Asian agamid genus Hydrosaurus: *Hydrosaurus amboinensis* (Schlosser, 1768) from Ambon, Seram, Sulawesi and New Guinea, *H. pustulatus* from the Philippines, *Hydrosaurus weberi* Barbour, 1911 from Halmahera and adjacent islands, *Hydrosaurus celebensis* Peters, 1872 and *Hydrosaurus microlophus* Bleeker, 1860 from the synonymy of *H. amboinensis*, which in turn is restricted to the central Moluccas and New Guinea (Denzer et al., 2020). You can read more about how these species differ from each other in the mentioned article by Denzer and co-authors called “Dragons in neglect: Taxonomic revision of the Sulawesi sailfin lizards of the genus *Hydrosaurus* Kaup, 1828 (Squamata, Agamidae)” – which is mentioned in the references.

Figure 1. Distribution of *H. pustulatus* (https://en.wikipedia.org/wiki/Philippine_sailfin_lizard)

Figure 2. Differences in head morphology of *H. pustulatus* male and female.

They live mainly near the water at tropical humid forests (rivers, riverbanks, rice-fields, etc.) and like to swim. As the matter-of-fact Sailfin lizards are the ecological equivalent of the Australian water dragon (*Intellagama lesueurii*, formerly *Physignathus lesueurii*, Gray, 1831). These diurnal, semi-aquatic lizards spend their daytime sunbathing in vegetation overhanging the rivers and streams. At the first sign of danger, they quickly jump down or run into the water until they sink and swim away. *H. pustulatus* can hide on the bottom for up to 1 hour until it feels safe.

The adults could reach 100 cm (40 in), including tail. Body and tail are cylindrical, high and laterally compressed. *H. pustulatus* has erect sail of skin along the lower back and base of the tail. It can be as high as 6-7 cm (2.4-2.8 in) in some specimens. This sail plays an important role in territorial display and swimming. Its form and location provide better propulsion through the water when swimming and diving. It also acts in heating and cooling, allowing the lizard to expose a larger body area to the sun to warm up quickly. Flattened toes (Fig. 3) enable juveniles to run across water. Adults use these structures for swimming. The coloration is formed by mottled dark, olive green and brown colors, often with yellowish patches on the flanks and under the head. They are omnivorous, feeding on fruit, leaves, flowers, insects, crustaceans and small mammals.

The average *H. pustulatus* lifespan in captivity is 20-25 years and around 15 years in the wild.

Males can be sexed due to bigger heads (Fig. 2), presence of larger crest on their backs and higher tail sails. They also have considerably blacker limbs and head that become violet during mating season. Females are less colorful and have considerably smaller crest. During mating season only neck part of the female's crest becomes violet.

Figure 3. Flattened toes of *H. pustulatus* juvenile.

Females make 1 clutch (2-8 eggs) per breeding season, but in good years they can make several clutches. They lay eggs in shallow holes that they dig in the soil near the water above the flood line. Neonates hatch during rainy season. Their swiftness and agility enable them to escape from natural predators (snakes, birds and fish).

Figure 4. Adult *H. pustulatus* male.

Sailfin dragons are very nervous when disturbed in captivity. These lizards scratch and twirl a bit if captured, but chill out quickly. Hand-feeding will help to gain their trust and reduce stress level (Scott Corning, 2015). No doubt, that adult Philippine sailfin dragons are the most spectacular representatives of *Hydrosaurus* genus and the great display animals for any zoo (Fig. 4).

Keeping and breeding requirements

Enclosure. We use large, semi-arboreal enclosure that provides enough space for 3 adult individuals (one male and 2 females). It is recommended space of 200*80*150 cm (80*32*60 in) per one adult individual. Currently we use a bigger enclosure of about 250*150*200 cm (98.42*59.05*80 in) where we keep a group of 1 male and 4 females (1.4). The enclosure is equipped with a pool (50 cm (19.68 in) deep), plenty of logs, basking place, egg-laying site with coconut substrate and artificial plants (Fig. 5-6).

Figure 5. An enclosure specially designed for *H. pustulatus* 1.4 group.

Figure 6. *H. pustulatus* female inside our enclosure.

As the matter of fact, we used to keep a group of 1.2 in much smaller enclosure. We used bark chips as a substrate. Other substrates (peat, soil mixture or clean sand) can also be OK. They hold moisture and create humid environment, which is essential for proper shedding (Scott Corning, 2015). A pool with water should occupy not less than 2/3 of the enclosure's area. Water depth should be not less than 30 cm (12 in). Sailfins often jump into the water from significant heights and water should amortize the fall and prevent lizard from serious injuries. Decoration includes horizontal logs and driftwoods installed above the water.

All enclosure sides should be provided with visual barriers to prevent animals from rostral damaging.

We keep juveniles at 120*50*70 cm (47*20*28 in) enclosures with logs and driftwoods. Pool is also much smaller than for adults. We use no substrate.

Temperature. Daytime temperature is +26 - +28°C (78.8 - 82.4 F), nighttime +24 - +26 °C (75.2 - 78.8 F). At the basking point temperature reaches +35 °C (95.0 F). In cooler climates or in winter, ceramic heat emitters can be used to help warm the enclosure (Scott Corning, 2015).

Humidity. Humidity level is 80-100%.

Lighting. We use simple fluorescent lamps for lighting. UV lamps are obligatory. Day lighting is provided 12/12. We use **"**Raptor Solar" 80W lamps for heating.

Diet. Diet for juveniles (Fig. 7) consists of herbs (dandelion, nettle, hemp, clover, arugula, coltsfoot, flowers of acacia, roses, etc.) and insects (crickets, turkestan cockroaches and locusts) at spring-summer period. During autumn-winter period we offer the same set of plants dried enriching the menu with Chinese cabbage, carrot, leek, salad, germinated buckwheat, pumpkin, sunflower, peas, beans, parsley, basil, dill, spinach and mung. We offer herbs every day and insects – every other day.

Figure 7. *H. pustulatus* hatchling.

Diet for *adults* consists of the same set of herbs and insects with the same seasonal changes. We also add fruit, berries and vegetables to the adult menu (apples,

apricots, peaches, kiwi, bananas, grapes, persimmon, blueberries, raspberries, currant, radish).

References

1. https://en.wikipedia.org/wiki/Philippine_sailfin_lizard
2. http://eol.org/pages/963478/details
3. https://www.arkive.org/sail-fin-lizard/hydrosaurus-pustulatus/
4. http://www.reptilesmagazine.com/Care-Sheets/Lizards/Sailfin-Dragon-Lizard/
5. http://www.sailfindragon.com/sailfindragons.html
6. http://reptilepark.com.au/animals/reptiles/exotic-lizards/philippine-sailfin-lizard/
7. http://agama.su/glr/displayimage-24-2.html
8. Denzer W., Campbell P. D., Manthey U., Glässer-Trobisch A., Koch A. 2020. Dragons in neglect: Taxonomic revision of the Sulawesi sailfin lizards of the genus Hydrosaurus Kaup, 1828 (Squamata, Agamidae) // Zootaxa 4747(2): 275-301. DOI: 10.11646/zootaxa.4747.2.3