



HETEROPNEUSTES FOSSILIS (ASIAN STINGING CATFISH)

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Abstract

This air sac catfish can be reported from India, Bangladesh, Pakistan, Nepalese, Asia, Thailand, Myanmar, and Bhutan, where it is known as the Asian stinging catfish (*Heteropneustes fossilis*). *H. fossilis* can be found in muddy rivers as well as ponds, canals, swamps, and marshes. It is able to survive in mildly salted water. It can eat anything. During the monsoon, this species breeds in restricted water, although it can also breed in ponds, abandoned ponds, and ditches if there is enough rainwater. Due to its supposed medical properties, it is in high demand. Humans can be stung to death by the stinging catfish. Known to cause severe agony is a gland on its dorsal fin spine that secretes poison. Fisheries in the area depend heavily on this species, which reaches a maximum length of 30 cm (12 in). It is also cultivated for the aquarium trade and available there. In Kerala, India, it's known as kadu or karri in local dialects (Malayalam). Assamese people call it singhi and it is very popular. In Dhaka, this fish is known as singi mach, whereas in Sri Lanka, it is known as hunga.

Keywords : *Heteropneustes fossilis*, taxonomy, carnivorous, environment.

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Introduction

During the prespawning season (May–June) of the catfish *Heteropneustes fossilis*, vitellogenesis is initiated and finished, such that by the beginning of the spawning period (July–August) all the ovaries are filled with yolky oocytes. Once a year, during the monsoon season (July–August), the catfish ovaries are stimulated to mature by a combination of environmental variables. Gonadotropins and other adrenocorticosteroids can be administered to the catfish in the laboratory to reactivate oocyte maturation, but the process is indefinitely halted. This suggests that oocyte maturation necessitates the activation of both the gonadotropin-ovarian and the gonadotropin-inter-renal axis, as opposed to just the gonadotropin-ovarian axis, which appears to require a separate set of hormones. Oocyte development and vitellogenesis are mostly unaffected by corticosteroids, however the effect of ovarian steroids in the maturation of catfish oocytes is not fully understood. The hormonal profile of the gravid catfish before to and throughout oocyte development, as well as the interactions between gonadotropin, cortisol, and ovarian steroids during oocyte maturation, are discussed in this work. Catfish of the genus *Heteropneustes*, often known as airsac catfish, are native to Asia. The species in this genus are all of a single type. Their limbs are stretched and crushed, and their heads are severely lowered. Their gill chambers include large air sacs that serve as lungs for these fish. Unlike other fish, they lack a spine in their dorsal fins. The fish are considered hazardous because of the venom gland on their pectoral fins. They are oviparous, which means that they may breed independently. Inexperienced anglers should avoid handling the stinging or fossil catfish, *H. fossilis*. At the base of the pectoral spines are sacs that carry the venom. A sting from one of these can be extremely painful, and in some extremely rare situations it can even be deadly. As a general rule, utmost caution must be observed when performing tank

maintenance or moving fish for any reason. After being stung, the wound must be submerged in hot water to denature the proteins in the venom. In addition, a doctor should be called in. It's a tough and long-lived species that can easily last for 20 years or more if cared for properly. Allowing it to survive in harsh environments, it can inhale atmospheric air. To make swimming easier, the swim bladder is reshaped into an extended air sac and attached to the gill chamber. It can also totally close its gills and generate a mucus to assist slow down the drying process. Because of these modifications, it is able to venture out of the water for brief periods of time and explore new locations. *Heteropneustes* is a confusing genus with many different species. Despite the fact that there are currently four recognised species, at least one of these (*H. microps*) is under dispute. However, some claim that the species is distinct, while others contend that the only distinguishing characteristics are geographical location and a feature of the anal fin that may really be due to injuries rather than heredity.

Species

There are five identified species in this genus:

1. *Heteropneustes fossilis* (Bloch, 1794) (stinging catfish)
2. *Heteropneustes kemratensis* (Fowler, 1937)
3. *Heteropneustes nani* Hossain, Sarker, Sharifuzzaman & Chowdhury, 2013
4. *Heteropneustes longipectoralis* Rema Devi & Raghunathan, 1999
5. *Heteropneustes microps* (Günther, 1864)

Systematic Position:

Kingdom : Animalia
 Phylum : Chordata
 Class : Teleostei
 Order : Siluriformes
 Family : Heteropneustidae

Genus : *Heteropneustes*
Species : *Heteropneustes fossilis*



Distributions: Andaman and Nicobar Islands; Laos; Myanmar; Nepal; Pakistan; Sri Lanka and Thailand; and Bangladesh (Talwar and Jhingran, 1991)

Morphology: As the body lengthens and compresses, so does its appearance. Plate of osseous material covers both the top and the sides of the head. While the maxillary and mandibular pairs extend to the base of the pelvics, their nasal pairs are significantly shorter than their mandibular counterparts, which are longer in length. The gill chambers on either side of the vertebral column have a pair of accessory respiratory organs (air sacs) that extend rearward from them. Circumscribed. 6-6.65-inch standard head circumference; 6.8-7.2" total head circumference. Standard height is 5.8-6.3 inches and overall length is 6.4-7.0 inches. Snout 2.5-3.4, interorbital distance 3.5-5.0, snout-to-eyeball distance 2.5-3.2 in head (Rahman, 1989). Reddish brown or purplish brown, however in mature specimens it turns black.

Maximum lengths: 30 cm and 27.9 cm

Habitats: Ponds, ditches, swamps, and marshes are the most prevalent habitats, but it can also be found in muddy rivers. From the Chalan beel in Rajshahi (Galib *et al.*, 2009 and 2010) (Samad *et al.*, 2010).

Food and feeding: Mollusks account for 15.5%, Cypris 15.6%, and Chironomid larvae account for 13.4%; fish and scales account for 11.1%, invertebrate eggs account for 13.2%, copepods account for 16.5%, weeds account for 20.3%, detritus accounts for 41.0%, and fungal and other organisms account for 16.3%. (Shafi and Quddus, 2001).

Body composition: It contains 23.0 g of protein, 0.06 g of fat, 670 mg of calcium, and 650 mg of phosphorus in each 100 g serving (Siddique, 1996).

Spawning: At the age of one, when males are typically 5.5 cm tall and females are 12 cm, a child reaches sexual maturity (Talwar and Jhingran, 1991). In hatcheries in Bangladesh's Jessore district, there has been an increase in the use of artificial insemination (Galib, 2011). In Bhuiyan's (1964) definition of a fertilised egg, it is green, sticky, demersal, and spherical in shape (Talwar and Jhingran, 1991). The range of fecundity was found to be 2,843–44,724 (Shafi and Quddus, 2001).

Fishery info: In Bangladesh, fish is consumed as food. Medicinal worth and commercial importance make it a highly sought-after commodity (Talwar and Jhingran, 1991). For its energising properties, it is suggested for use by patients who have recovered from malaria (Bhuiyan, 1964). Always sold in a live state

Others: Because of its aggressive nature and the ability of its pectoral spines to inflict terrible wounds, it is dreaded by many (Talwar and Jhingran, 1991).

Reproduction

Few data are known about this species, which has been bred in captivity. Pre-excavated pits are used by substrate spawners to lay their eggs. Once the eggs are laid, both parents are responsible for watching over and caring for the chicks until they are ready to leave the nest. Breeding it for food is common in several of its native nations, both naturally and artificially via hormones.

Behaviour and Compatibility

As long as you've got larger and more active species in the tank, it's a pleasant environment. Bigger characins and cyprinids are the best bets for a variety of habitats in the tank. Other benthic or slow-moving species pose a greater threat because of the predator's nocturnal proclivity to harass them. It's a sociable fish that prefers to be kept in a small group.

Maintenance

This fish does best in a dimly lit tank with a variety of hiding spots and open water. With smooth rocks, driftwood, plastic pipes, and other materials, this can be made into an interesting piece. Make sure the tank's lid is properly fastened, as in nature it is known to cross tiny sections of dry land in search of more water. As a result, if given the chance, it will most likely flee. As a result of the high volume of trash it generates, effective filtration is essential.

Induced breeding

Fish reproduction occurs at regular intervals and is regulated by both external and endogenous factors. When a species breeds, it does so in an environment that is advantageous to the survival of its offspring. Sensory organs pick up on external cues and transmit them to the brain, where they activate an internal process. The brain-hypothalamuspituitary-gonad axis secretes a variety of neurotransmitters and hormones that act as an endogenous mechanism. Favourable and unfavourable feedback processes involving hormone receptors that are particularly sensitive control the production of the above-mentioned axis. Hormones play a key part in the process of reproduction in fish, as they do in other higher animals. The brain, anterior pituitary, and testicles are the three principal tissues implicated in this hormonal cascade.

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