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A note on morphology, biology and possible conservation measures for *Chanda nama* (Hamilton, 1822), a threatened fish of Indian subcontinent

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Abstract

Chanda nama is a popular food fish. It has high nutritional value due to the presence of high amount of protein, fat, mineral and vitamin A content. It has also been admired as an ornamental fish and has good demand among the aquarium fish hobbyists. Due to over exploitation and degradation of its natural habitats, recently populations of this fish species are facing the threat of extinction. It has already been documented as vulnerable in Bangladesh and West Bengal, India. So, to protect the populations of *Chanda nama*, proper measures must be taken on a serious note. The present report has been prepared to summarize the available information on different aspects of *Chanda nama* along with noting down the possible measures that can be considered for its conservation.

Keywords: *Chanda nama*, Elongated glass perchlet, Threatened, Conservation

1. Species introduction

Chanda nama, commonly known as elongated glass perchlet is a popular food fish having good consumer preference. It has high nutritional value due to the presence of high amount of protein, fat, mineral and vitamin A content ^[1-4]. It is also a popular aquarium fish and has high market demand among the ornamental fish hobbyists ^[5-8]. Recently this fish species is reported to be exported from India to other countries as indigenous ornamental fish ^[9].

2. Synonyms

Chanda nama (Hamilton, 1822)

Chanda bogoda (Hamilton, 1822)

Chanda phula (Hamilton, 1822)

Ambassis oblonga (Cuvier, 1828)

Equula ovata (Swainson, 1839)

Ambassis indica (McClelland & Griffith, 1842)

Ambassis nama (Day, 1878)

3. Taxonomic notes

Kingdom: Animalia

Phylum: Chordata

Class: Actinopterygii

Order: Perciformes

Family: Ambassidae

4. Common names

Chanda nama is vernacularly known as chanda/nama chanda in India and Bangladesh ^[10] while nata channa/chanerbijuwa in Nepal ^[11].

5. Conservation status

Chanda nama has been reported as vulnerable in Bangladesh ^[12] and West Bengal, India ^[13], though it has been reported as Least Concern under IUCN Red List of Threatened Species ^[14].

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6. Morphological characters

Talwar and Jhingran ^[10] and Day ^[15] have well documented the morphological characters of *Chanda nama* which have been noted down here: the body is strongly compressed and laterally almost flat. The dorsal and abdominal profiles are equally convex; a considerable rise can be seen from the occiput to the base of the first dorsal fin. The lower jaw is much longer than the upper jaw. The maxilla is used to reach below the anterior third of the orbit. Pre-orbital with three denticulations along its posterior-superior margin; also a denticulation behind them is present at the middle of the front edge of the orbit, and another at its posterior-superior angle. Vertical limb of pre-opercle is entire except near its angle where there are two or three denticulations which become blunted with age; the double border, very slightly denticulate at its lower edge in the young, often entire. Sub and inter-opercles are entire. Teeth- two or three large and crooked canines directed forwards on either side of the symphysis of the lower jaw; an outer and an inner enlarged row are present in both the jaws; fine ones on the vomer and palatines. Fins- the dorsal fin spines are of moderate strength; the second spine is the longest and equal in length to the head behind the anterior edge or middle of the eye, or to about half the height of the body below it, the seventh dorsal spine somewhat longer than the sixth. The spine of the second dorsal fin is as long as the first ray; the rays are gradually decreasing in height. The ventral fin reaches a little beyond the anus but not so far as the anal fin. The third anal spine is the longest and strongest equaling the height of the longest in the dorsal fin. The caudal fin is deeply forked; the lobes are of equal length. Scales- minute, are scarcely visible on the head. Lateral line- always indistinct; in some specimens it is entire, in others it ceases after preceding a short way, or it may even be absent. Color-yellowish olive; is covered all over with minute black dots which on the shoulder are collected into an oblong patch. Summit of the head and top of the eyes are black. Fins are orange, the upper half of the first dorsal fin is deep black; upper edge of the second dorsal fin is dark; caudal fin is dark with a light outer margin; anal fin is with a black mark over the bases of the spines. (Figure 1)



Fig 1: A fresh specimen of *Chanda nama*

7. Distribution

Chanda nama is widely distributed in India, Bangladesh, Pakistan, Nepal and Myanmar ^[10, 15].

8. Habitat

Chanda nama is inhabitant of both standing and running waters; is used to occur in rivers, streams, canals, beels and ponds ^[10]. During the rainy season, it can be abundantly found in marginal areas of paddy and jute fields ^[16, 17]. It is very timid in nature; on slightest provocation it used to try to hide

near the bottom or among the leaves and fronds of submerged aquatic vegetation ^[18].

9. Growth pattern

Negative allometric growth pattern has been reported in *Chanda nama* by Hossain *et al.* ^[19] and Alam *et al.* ^[20].

10. Feeding habit

Chanda nama is a surface and column feeder ^[18, 21]. It is predominantly carnivorous in nature; insect parts, fish scales and pieces of higher aquatic plants have been reported from its gut content ^[18]. Natarajan *et al.* ^[22] have documented that this fish is usually a zooplankton feeder, but also has a preference for insect. Job ^[23], Hora and Mukerji ^[24] have reported its larvivorous nature. Roberts ^[25] has reported its lepidophagous nature which later has been supported by Grubh and Winemiller ^[26] who have reported an ontogenetic diet shift from juveniles to adults in this fish species. Juveniles have been reported to feed heavily on aquatic insects (mostly Ephemeroptera but including Odonata and Coleoptera) and microcrustacea (calanoid copepods, Cladocera, Isopoda and Amphipoda) while fish scales are significant dietary elements (15-90% of the monthly mean volume of adult stomach contents) for adults apart from zooplankton and terrestrial insects.

11. Reproductive biology

July-November and February-August have been reported as its breeding season in Bangladesh by Bhuiyan ^[16] and Parween *et al.* ^[27] respectively while Gupta ^[18] and Jones ^[28] have documented June-August and April-May for the same in India. Later, Grubh and Winemiller ^[26] have reported March-July as its breeding season in Western Ghat, Tamilnadu, India. Grubh and Winemiller ^[26] further have documented standard length of 25 mm as length at first maturity for this fish species. Parween *et al.* ^[27] have reported it as a highly fecund fish, having an average fecundity of $2,849.082 \pm 1,578.98$.

12. Threats

Over-exploitation and degradation of natural habitats due to various ecological changes have been reported as major threats behind serious declination of its populations ^[19].

13. Recommendations for conservation

Till date no such measures have been taken to conserve *Chanda nama*. The following actions can be considered for its conservation: (i) over exploitation must be checked and this can be achieved by imposing ban on fishing during the breeding season and by suggesting size specific capture; (ii) the existing populations must be protected and this can done by establishment of some protected areas in water bodies where their populations are still present; (iii) factors causing ecological changes in its natural habitat must be identified and proper measures must be taken to solve these problems; (iv) captive breeding is one among the noble measures so far has been suggested by the experts to support conservation of any fish species but till date it has not been tried for this fish species. This should be attempted to increase the supply and to reduce the pressure on the natural stock; (v) apart from these measures, awareness program must be arranged to catch the attention of the general people about the problem and then using their support, conservation campaigns can be promoted through education and extension programs.

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