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An Overview on Food, Feeding Habit and Reproductive Biology of *Puntius conchonius* (Ham-Buch, 1822); a Freshwater Cyprinid of Indian Subcontinent

Sandipan Gupta

Central Inland Fisheries Research Institute (ICAR), Barrackpore, Kolkata-700120, India

Abstract: *Puntius conchonius*, a freshwater cyprinid of Indian subcontinent is a popular food fish mainly of eastern part of India and Bangladesh. It has also its importance as an ornamental fish and having good demand in both domestic as well as international ornamental fish markets of India. Though a potent commercially important fish; so far not much work has been done on food, feeding habit and reproductive biology of this fish species. Not only that, the presently available information is also in a scattered format; no such consolidated report is available on these aspects. So with this view, the present report has been prepared to sum up all these available information along with pointing out the lacunae of information study of which will help to make its fishery and trade more vibrant and sustainable.

Key words: Feeding Habit · Reproductive Biology · *Puntius conchonius* · Indian Subcontinent

INTRODUCTION

Puntius conchonius (Hamilton-Buchanan, 1822) which is commonly known as "rosy barb" is a freshwater species of cyprinidae family under the order cypriniformes. It is commonly found in lakes, rivers, streams, ponds, ditches, inundated water bodies and is widely distributed in India, Bangladesh, Pakistan, Nepal, Afghanistan and Myanmar [1-5]. This fish species has a good demand as food fish mainly in eastern part of India and Bangladesh [6]. Its potential as an ornamental fish has been reported earlier [2, 6-8] and just recently it has also made its entry in both domestic as well as international ornamental fish markets of India [9-11]. The natural population of this species is under pressure due to over exploitation and anthropogenic interferences in their natural habitat [6]; this fish species is under vulnerable category as per CAMP report [12] and under Least Concern category as per IUCN Red List of Threatened Species [13]. Earlier few works has been carried out on food, feeding habit and reproductive biology of *Puntius conchonius*, but no such consolidated report is available on these aspects. So with this view, the present report has been prepared to sum up all the available information along with pointing out the missing information study of which can be useful enough to sustain its fishery and ornamental trade.

Morphology: Day [1] and Talwar and Jhingran [2] have well documented the morphological features of *Puntius conchonius*; which are as follows:

Body is deep and compressed; its depth 2.2 to 2.5 times in standard length. Head is 4.1 to 4.5 times in standard length. Body is elevated; a slight concavity is there over the nape, followed by a considerable rise to the base of the dorsal fin. Mouth is moderate; barbels absent. Scales medium in size; lateral line is incomplete. Fins: dorsal fin 3/5 as high as the body, its last undivided ray osseous, moderately strong and serrated, as long as the head without the snout; the fin commences rather anterior to the insertion of the ventral, and midway between the anterior extremity of the orbit and the base of the caudal, which latter is forked in its last half. Color: back shinning olive green in color; flanks and belly are silvery tinged with reddish, shining ink-red at spawning time; a deep, slightly ocellated black, golden-yellow bordered blotch on caudal peduncle at level of trailing edges of anal fin. Fins are orange, dorsal fin with its upper half blackish.

Food and Feeding Habit: Not much work so far has been done on food and feeding habit of *Puntius conchonius*. Tripathi and Siddiqui [14] in their study have documented phytoplankton including diatoms to form the main bulk (85.56%) of diet in the adults whereas preference for

Corresponding Author: Sandipan Gupta, Central Inland Fisheries Research Institute (ICAR), Barrackpore, Kolkata-700120, India.

zooplankton has been reported more in juveniles. Mills and Vevers [15] and Allen *et al.* [16] have reported *Puntius conchonius* used to feed on worms, crustaceans, insects and plant matter.

Sexual Dimorphism: Dobriyal *et al.* [17] have documented few sexual dimorphic characters for *Puntius conchonius* which are as follows: male is with dark black shade on the dorsal, ventral and anal fins, absent in female; upper portion of the body shinning olive green and lower portion silvery in both sexes, but there is pinkish colour in males between these two portions, which is not visible in the female specimens; the snout is broader on upper side in the female compared to the male.

Sex Ratio: Information on sex ratio in population of *Puntius conchonius* is very much scanty; Çek *et al*. [7] have reported female dominance in the population of this fish species in their study while Bahuguna *et al.* [8] have reported equal proportion of female and male in their studied population.

Fecundity: Shafi *et al*. [18] have reported that in *Puntius conchonius* absolute fecundity is used to fluctuate from 154.07- 7,202.91 and relative fecundity from 43- 1,268 with a mean value of 495.8. They also have reported a significant linear relationship of fecundity with body weight, total length, ovary weight and ovary length. Bahuguna *et al*. [8] have reported the absolute fecundity range of 523-1,366 in *Puntius conchonius* in their study. Çek and Gökçe [19] have reported fecundity range of 198-1,696 while Varadi and Horvath [20] have documented range of 450-1,500 for the same.

Breeding Periodicity: No information till date has been reported on breeding periodicity of *Puntius conchonius* except by Shafi *et al*. [18] who have reported May to July as the breeding season of *Puntius conchonius* with peaks in June and July in Dal Lake, Kashmir. They have also reported it as a partial or batch spawner.

CONCLUSION

Considering the information so far available on food, feeding habit and reproductive biology of *Puntius conchonius*; it is quite clear that much more detail study is needed on all these aspects to get the clear cut conclusion. Till date no firm conclusion is there regarding its feeding habit; Mills and Vevers [15] and Allen *et al*. [16] have reported it as an omnivorous fish species (as per the food this fish species is used to consume) while Tripathi and Siddiqui [14] have documented its preference mainly for planktons; juveniles having preference for zooplankton while adults having more choice for the phytoplankton. So apart from the very basic methodology of gut content analysis; morpho-histological study of the alimentary tract and enzymatic analysis of the digestive canal can be done to put a firm conclusion on its feeding habit in near future. On the other hand, information available on sex ratio of its population is quite contradictory; Çek *et al*. [7] have reported female dominance while Bahuguna *et al*. [8] have documented equal proportion of male and female in its population. Same kind of contradiction exists there on its fecundity; moderate fecundity range has been documented by Shafi *et al*. [18] while Varadi and Horvath [20], Çek and Gökçe [19] and Bahuguna *et al*. [8] have reported it as a low fecund fish. So focus must be paid to continue further study to clear out these confusions along with gathering of information on its breeding periodicity on which so far only a single work by Shafi *et al.* [18] has been performed. No such information till date is available on length at first maturity for this fish species; which is important information regarding conservation of any fish species. So length and age at first maturity for this fish species must also be studied.

Information on food, feeding habit and reproductive biology of any fish species is very much important to get success in captive culture of that fish species. Considering the high demand of *Puntius conchonius* among the hobbyists; it is really needed to support its supply by captive culture. So, further study should be performed on food, feeding habit and different aspects of reproductive biology of this fish species to fill up the missing links and to support and sustain its trade in long run.

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