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Rita rita (Hamilton, 1822), A Threatened Fish of Indian Subcontinent

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Abstract

Rita rita is a commercially important catfish species which has good market as a food fish as having excellent taste and good protein content in its flesh. In recent times it has also been admired as an ornamental fish. Recently due to over exploitation and loss of breeding grounds, populations of this fish species are facing the threat of extinction. Already it has been documented as lower risk near threatened in India and critically endangered in Bangladesh. So, to protect the populations of *Rita rita*, proper measures must be taken as quickly as possible on a serious note. The present report has been prepared to gather the available information on different aspects of *Rita rita* along with noting down the possible measures that can be considered for its conservation.

Keywords: *Rita rita*; Catfish; Threatened; Conservation.

Introduction

Rita rita is a commercially important catfish[1,2]; forming a good fishery in major rivers of the Indo-Gangetic plains[3]. It is a well admired food fish as having good taste and rich protein content[4-7]. Recently it has also been considered as an ornamental fish and has been documented to have been exported as indigenous ornamental fish from India[8].

Synonyms

Pimelodus rita (Hamilton, 1822), *Arius ritoides* (Cuvier and Valenciennes, 1840), *Rita ritoides* (Cuvier and Valenciennes, 1840), *Arius rita* (Cuvier and Valenciennes, 1840), *Rita crucigera* (Owen, 1853), *Rita buchanani* (Bleeker, 1854) .

Taxonomic Notes

Kingdom: Animalia. Phylum: Chordata. Class: Actinopterygii. Order: Siluriformes. Family: Bagridae

Common name

Rita/Ritha in both India and Bangladesh[1,9].

Conservation status

Lower Risk near Threatened in India[10]; critically endangered in Bangladesh[11]

Morphological characters

Talwar and Jhingran[9] and Day[12] have well documented the morphological characters of *Rita rita* which has been summarized here. Body is very stout, solid built and without any scale. Abdomen is broad and flat. Head is large, depressed, broad and dorso-ventrally flattened. Median longitudinal groove on head is short, not visible externally, not reaching base of occipital process. Occipital process is 1-2 times longer than broad, notched posteriorly and is reaching basal bone of dorsal fin. Mouth is inferior and transverse; gape is wide and is as long as half of head length. Teeth are of mixed type; those on upper jaw are villiform, conical, in an uninterrupted slightly curved band; those on palate are molariform and villiform, in two separate, fairly wide apart elliptical patches which are occasionally connected at top. Three pairs of barbels are present; maxillary pair extends to operculum, nasal barbels are much shorter, mandibular pair extends to pre-operculum. The first dorsal fin is very large with a large, strong, hollow spine which is slightly serrated on its hinder edge. Second dorsal fin is adipose, well developed and broad based. Pectoral fin spine is shorter than dorsal spine and is serrated on both edges. Pelvic fin is without any spine. Caudal fin is deeply forked and lobes are of equal size. Body color is greenish grey above and on flanks, dull white on abdomen.

Distribution

Rita rita has wide distribution in India, Bangladesh, Pakistan, Nepal, Afghanistan and Myanmar[3,9,12-17].

Habitat

Rita rita is a riverine fish; a bottom dweller which prefers muddy or clear water[7,16,18]. Though basically it is a freshwater species, it can also endure well in the low salinity condition[9]. It's documentation from the speedy streams of Darjeeling district as well in the mid and upper stretches of the Yamuna and Ganga river in higher altitudes supports its tolerance to cold water condition to some extent. It can also withstand low dissolved oxygen concentration, high turbidity and odd environment[1]. This fish species has also been reported as a potent candidate for monitoring aquatic pollution as it has high tolerance limit to the fluctuating conditions[19,20].

Maximum length

150 cm[3, 9]; 122 cm[12,13]; 120 cm[15]; 60 cm[7,21]; 50 cm[2]; 45 cm[22]; 43.7 cm[23]; 41.7 cm[24]; 41 cm[25]; 31.9 cm[18]; 20 cm[26] have been reported as maximum length for *Rita rita* by earlier workers.

Feeding habit

Rita rita is a carnivore in all stages of life; the surface and column feeder fry consumes right from microscopic cladocerans, copepods to macroscopic spawn and fry of fishes; fingerlings are marginal and bottom feeder; take mainly insects, molluscs, shrimps etc [1]. Bottom feeding adults are carnivore; feed on fish, insect and their larvae, mollusks, crustacean and decaying organic matter[1,3,13,15,16,27-38].

Reproductive biology

Male and female of *Rita rita* can be identified observing some sexual dimorphic characters: in female, both interior and posterior margin of pectoral spine are serrated from tip to the base while in male anterior margin is serrated but the posterior margin is smooth a little above the base[25]. A muscular genital papilla which is present in male becomes distinct and prominent during breeding period; tip of the papilla becomes deep red in color during this period because of numerous blood vessels[25,39]; the genital aperture is introvert and slit-like in male while in female it is large, extrovert and swollen[1]. Saxena[39] has reported female dominance over male in the *Rita rita* population in his study and also has documented 29.5 cm as length at first maturity for female of this fish species. Khan[27] and Das[40] have reported 20,800 and 12,000 as its fecundity while Saxena[39] has documented fecundity range of 40,377 to 1,69,581 for this fish species. Rahman and Mollah[41] have reported fecundity range of 37,307 to 60,114. In Punjab, it breeds in June[27] while in Uttar Pradesh its natural breeding season is in July[40]. Observing the availability of its larvae and juveniles in Ganga, Karamchandani and Motwani[42] have anticipated its breeding period during March to August while Saxena[39] has indicated a prolonged breeding season from May to September with a peak in July-August with three spawning bursts in river Ganga. Rahman and Mollah[41] have reported that in river old Brahmaputra of Bangladesh, it breeds in between June-July.

Threats

Populations of *Rita rita* are facing threat of extinction due to over exploitation and loss of breeding grounds due to several ecological changes in its natural habitat with which they are unable to cope up[25,43,44].

Conservation measures

Captive breeding is one among the noble measures so far has been suggested by the experts to support conservation of any fish species and proper information on feeding habit and reproductive biology of that particular fish species is needed to get success in captive breeding. So far ample works[1,3,13,15,16,27-42] have been carried out on both these two aspects of *Rita rita*. Mollah et al.[43] and Taslima and Mollah[45] also have tried to induce bred *Rita rita* using carp pituitary extract and both have suggested the dose of 100 mg/kg of body weight to achieve the best outcome in respect to ovulation, fertilization and hatching success.

Recommendations for conservation

The information on conservation status of *Rita rita* in India and Bangladesh has been documented almost a decade ago; the present scenario might have changed in between and thus a thorough survey is really essential to gather the knowledge about the current status of this fish population in the nature. The waterbodies where the populations of this fish species still exist must be identified and proper measures must be taken to protect the populations. This can achieved by the following measures: i. complete banning on fishing practice during the breeding season of this fish species to protect the brood fish; ii. size specific capture must be suggested to protect the juveniles; iii. over harvesting must be checked; iv. the factors causing ecological changes in its natural habitat and resulting loss of breeding grounds must be identified and proper measures to be taken to solve these problems.

Mollah et al.[43] and Taslima and Mollah[45] have already successfully induced bred *Rita rita* in captive condition using carp pituitary extract; but further study is needed to gather knowledge on potential of synthetic inducing agents for this purpose. Successful induced breeding is not the only solution to support conservation; rather its ultimate success depends on proper rearing of the spawn and fry to achieve maximum survivability. In this regard, proper information on feeding biology of the particular fish species is essential. Information so far documented on feeding biology of *Rita rita* is quite satisfactory and further experimentation based on this information will surely be helpful to promote its captive culture. 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.

Conclusion

As per the information documented in this report it is quite clear that satisfactory information is available on feeding and reproductive biology of *Rita rita*; but further there is some more scope to gather information in some areas especially on stage wise variation in food preference for this fish species if any (which will be helpful for successful rearing of the early life stages in captivity), sex-ratio and length at first maturity (for conservation purpose) and on natural factors stimulating its reproduction. Natural populations of this fish species has already been reported to be under threatened condition; thus the conservation measures which have been recommended in this report must be considered seriously to protect the existing populations as well as to support its fishery.

Figure-1
A fresh specimen of *Rita rita*

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