

An Overview on Feeding and Breeding Biology of *Mystus tengara*, A Freshwater Catfish of Indian Subcontinent

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Abstract: *Mystus tengara* is a freshwater catfish of Indian subcontinent having good market demand as food fish due to its good taste and high nutrient profile. Recently it has made its entry in ornamental fish markets and also has been reported to be exported as indigenous ornamental fish from India with moderate export price. Earlier not much work has been performed on feeding and breeding biology of this fish species and the information so far available on these two aspects is also in a scattered manner. So in the present report it has been tried to sum up all the available information on these aspects along with noting down the lacunae of information further study of which will be beneficial for its future fishery and management.

Key words: *Mystus tengara* • Feeding Biology • Breeding Biology • Freshwater Catfish

INTRODUCTION

Mystus tengara (Ham.-Buch. 1822), commonly known as Tengara *Mystus* is a freshwater catfish species of family Bagridae under the order Siluriformes. It used to inhabit in both flowing and standing waters of rivers, ponds, inundated fields and derelict water bodies; and is mainly distributed in India, Nepal, Bangladesh, Pakistan and Afghanistan [1-3]. This fish species has a good market demand as food fish due to its good taste and high nutrient profile with good protein content [4]. It has also been reported to be useful in treatment of calcium deficiency [5]. Recently this fish species has got its entry in ornamental fish markets [6, 7] and has been reported to be exported from India as indigenous ornamental fish with moderate export price too [8, 9]. Even considering its commercial importance, so far not much works have been carried out on feeding and breeding biology of this fish species and the information so far available on these two aspects is also in a scattered manner. So in this report it has been tried to consolidate so far available information on these aspects along with pointing out the lacunae of information further study of which is needed to explore the fishery and management of this fish species in near future.

Morphology: Talwar and Jhingran [2] and Day [10] have well documented the morphological features of *Mystus tengara* which has been summarized below:

Body is elongated and somewhat compressed; its depth 2.5-3.3 times in standard length. Head is depressed, drawn out to a rounded point. Occipital process is about 3 times as long as broad, extending to the basal bone of dorsal fin; median longitudinal groove on head is reaching base of occipital process. Eye diameter 4-4.5 times in head and 1.5-2 times in inter-orbital width. Mouth is terminal; teeth are villiform in bands on jaws; vomerine tooth-band is continuous and crescentic. Gape of mouth equals to 2/5 of the length of the head. Barbels are four pairs in number; maxillary barbels extend to base of pelvic fins, the nasal ones are nearly as long as the head, the external mandibular extend to the base of pectoral fin, while the internal mandibular are shorter. Fins- dorsal spine is as long as the head excluding the snout slightly serrated anteriorly in its upper third and posteriorly in its whole extent. Adipose fin is long, inserted close behind the rayed dorsal fin, the length of the base of the adipose dorsal is 1/3 less than that of the rayed fin and equals 1/2 the length of the interspace between the two fins. Pectoral spine is nearly as long as the head in length; is stronger than that of the dorsal, smooth externally and with about 13 denticulations internally. Pelvic fins arise on a vertical line just behind the last dorsal ray. Caudal fin is forked; its upper lobe is the longer. Color- delicate greenish to bright yellow; back only slightly darkened, usually pale brown, flanks and belly are porcelain white, 4-5 wavy dark brown to green-black longitudinal bands are present on the flanks, which taper remarkably posteriorly and eventually

entirely disappear; a dark blotch is present over the pectoral fin, is often indistinct. In some specimens, the mandibular barbels are white with a black streak. Fins are hyaline, delicate bluish in colour.

Food and Feeding Habit: Except Gupta and Banerjee [11], no such work so far has been done on food and feeding habit of *Mystus tengara*. They have reported it as a carnivorous fish with zooplankton as the basic food and rotifera as the mostly preferred food class for this fish species. A correlation between feeding activity and breeding periodicity has also been reported by them; poor feeding activity has been reported during intense breeding season while maximum feeding activity has been documented during the pre-spawning months.

Sexual Dimorphism: Gupta [12] has reported that male and female of *Mystus tengara* can be distinguished externally with the presence of genital papilla which is present only in male fishes. The papilla becomes very prominent during the breeding season. Females are comparatively larger in size than the males and during breeding season, they can be identified by observing their swollen abdomen.

Sex Ratio and Length at First Maturity: No such work so far has been done on these aspects of *Mystus tengara* except Gupta and Banerjee [13]. Female dominance over male in this fish population has been reported by them. They also have reported early maturation of males than females; 8.5-9 cm and 9-9.5 cm length class has been reported as length at first maturity for male and female of this fish species respectively.

Fecundity: Khan *et al.* [14] have reported fecundity of *Mystus tengara* to be ranged from 720-5,223 while fecundity range of 6,770-21,708 and 7,287-19,123 have been documented by Gupta and Banerjee [15] and Mitu and Alam [16] respectively. Significant positive correlation of fecundity with total body weight, total length, ovary weight and ovary length has also been reported by Gupta and Banerjee [15] and Mitu and Alam [16].

Gonadal Maturity Stages: Rastogi and Saxena [17] have documented seven maturity stages in *Mystus tengara* namely immature virgin, preparatory virgin, maturing virgin, pre-spawning virgin, spawning, depletion and recoupment which later has also been supported by Guraya *et al.* [18]. Five maturity stages namely immature,

maturing, mature, ripe and spent have been reported by Gupta and Banerjee [13] while Mitu and Alam [16] later have reported six maturity stages namely immature, maturing, mature, ripe, spent and resting for this fish species.

Breeding Periodicity: Guraya *et al.* [18] have reported July to September as the breeding season for *Mystus tengara* with July as its spawning month while Rastogi and Saxena [17] have reported June as its spawning month with April to August or early September as its breeding season. Gupta and Banerjee [13] have documented May to September as breeding season with July as the spawning month in West Bengal. Mitu and Alam [16] have reported April to July as breeding season for this fish species in Bangladesh.

Gupta and Banerjee [13] and Guraya *et al.* [18] have reported *Mystus tengara* as a single spawner while Mitu and Alam [16] and Rastogi and Saxena [17] have reported it as a multiple spawner.

Influence of monsoon rain and long photoperiod on gonadal maturity and spawning initiation of *Mystus tengara* has been reported by Guraya *et al.* [18, 19].

CONCLUSION

Considering the information documented in this report, it is quite clear that not much work so far has been performed on feeding and breeding biology of *Mystus tengara*. Gupta and Banerjee [11] have done a preliminary level of work on its food and feeding habit following gut content analysis which is one among the basic methodologies to ascertain feeding habit of any fish species. But further study should be done following few more methodologies like analysis of mouth morphology and mucosal surface of alimentary canal, digestive enzyme assay to put more information in this aspect. Gupta and Banerjee [11] also have reported correlation of feeding activity with breeding periodicity, but age-wise, sex-wise or size-wise variation in food habit or food preference if any to be further studied as this information are very important in respect to get success in captive culture of any fish species. Lack of information is also evidenced in respect to reproductive biology of *Mystus tengara*. Sex-ratio and length at first maturity has only been reported by Gupta and Banerjee [13] while comparatively much information is available on fecundity, gonadal maturity stages and breeding periodicity. Gupta and Banerjee [15] and Mitu and Alam [16] though have reported high fecundity with almost same range, Khan *et al.* [14] have

documented low fecundity for this fish species. Contradictory information is also available there in regard to gonadal maturity stages, Rastogi and Saxena [17] and Guraya *et al.* [18] have reported seven maturity stages while Gupta and Banerjee [15] and Mitu and Alam [16] have reported five and six maturity stages respectively for this fish species. So, further study is needed in these two aspects to put proper conclusion. Regarding breeding periodicity, workers from India have reported almost the same period as its breeding season while a little variation is there in respect to the report from Bangladesh. This discrepancy may be due to variation in onset of monsoon, photoperiod or hydrological parameters.

So, finally it can be concluded that so far not much information is available on feeding and breeding biology of *Mystus tengara* and thus these should be studied in detail to explore and proper management of the fishery of this commercially important catfish species in coming days.

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