

Short Communication

Record of Semi-operculum Deformity in *Sahyadria denisonii* (Teleostei: Cyprinidae)

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Abstract

Semi-operculum deformity was recorded in a wild specimen of *Sahyadria denisonii* from Western Ghats, India. Morphological study of a normal and deformed fish revealed semi-operculum malformation. The possible etiologies of opercular deformity are discussed.

Keywords: Deformity; *Puntius denisonii*; Semi-operculum; Western Ghats

Introduction

Morphological deformities are not infrequent in fish, having been recorded in both freshwater and marine fish species. Deformities in fishes are known to be caused as a result of environmental pollutants, scarcity of nutrients, sudden changes in temperature, water current, gene mutation, inbreeding, parasitic infestation and attack from predators [1,2]. Fin anomalies in general are extremely well documented in both wild and reared fish, but not operculum anomalies. *Sahyadria denisonii* (Day 1865) an ornamental fish, popularly known as the Redline Torpedo Barb or 'Miss Kerala' is endemic to the rivers flowing through the Western Ghats of southern India [3,4]. Due to over exploitation from wild for the global ornamental fish trade, this species has been listed as Endangered [4]. We document for the first time, a case of semi-operculum deformity in *S.denisonii* from the rivers of Western Ghats in India.

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Methodology

Deformed *S.denisonii* was caught in drag net operation from Palappuzha region of River Valapattanam (11.9499 latitude and 75.7338 longitudes) in May 2013. Morphological abnormality was photographed with a digital camera (Sony DSC-H20). For the comparison with deformed specimen, a normal fish (figure 1a-1e) from the same catch (Standard Length=30 mm) was also collected.

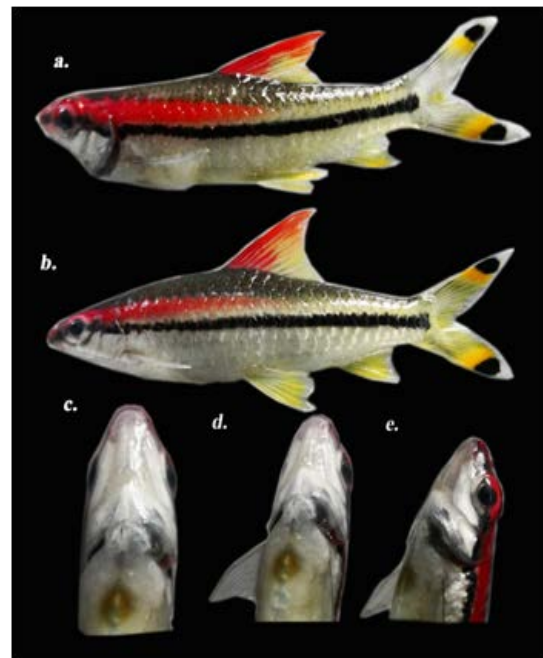


Figure 1: a. Deformed specimen of *Sahyadria denisonii*; b. Normal specimen; c-e. Deformed specimen with semi-operculum

Results and Discussion

A deformed specimen of *S.denisonii* collected from River Valapattanam was recorded with standard length of 29 mm, total weight of 79 mg with an age 0⁺. Age of the deformed fish was estimated from length frequency studies of *S.denisonii* by Sajan et al., [5]. Generally, operculum related deformities are related to inside or outside folding, shortening or abnormal positioning of the opercular and sub-opercular bones, both bilaterally or unilaterally [6]. In present records compared to a healthy normal fish (Figure 1b), the deformed wild caught specimen of *S.denisonii* possessed unilateral semi-operculum on the left side (Figure 1a,c-e). Similar types of operculum deformity have been reported in *Oreochromis niloticus* and *O.mossambicus* [7]. Although operculum abnormality is known to be generally unilateral, some species also show bilateral semi-operculum [8].

The streams and rivers in India, especially in the Western Ghats are facing number of environmental problems as a result of anthropogenic activities [9]. Record of malformed fish from polluted area are used as indicators of water pollution [8]. KSCSTE [10], reported that the River valapattanam has been polluted by the extensive usage of pesticides in adjacent land for agriculture and also by destructive fishing using dynamite and chemicals. Harikumar [9], also reported, upstream part of River valapattanam was found to be slightly polluted in both monsoon and post monsoon season. Subha [10], also specified pollutants have been a factor responsible for deformity in fishes.

Parasitic infestations, oxygen deficiency, water current, salinity, sudden change in temperature, toxic chemicals, hereditary may also accountable for deformity in fishes [11,12]. Environmental stress related deformities were also recorded in *Cirrhinus mrigala* and *Hypothalmichthys molitrix* from Bhavani River in Kerala [13]. Developmental errors such as embryonic, larval or early post larval development are also responsible for deformation in fishes [14]. Vitamin-C deficiency related operculum deformity has also been reported in hatchery reared *Cyprinus carpio* [15], *O.niloticus* and *O.mossambicus* [16]. Inbreeding [17], as well as genetic factors [18,19], can also elicit such abnormalities in fish species, although operculum deformity was found to be non-inheritable [18-22].

Conclusion

From the above discussion, it is clear that the fish deformities are very complex and are caused by multiple factors. Even though the exact cause for deformity in *S.denisonii* was not determined; combination of pollutants, pesticides, or genetic factors could be responsible. However, the present record is nevertheless significant owing to the evidence of the occurrence of semi-operculum in wild population of *S.denisonii*.

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