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First record of saddleback syndrome in wild species, *Etroplus suratensis* (Bloch, 1790) from the southeast coast of India

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Saddleback syndrome is represented by a crescent-shaped indentation on the dorsal surface, lack of few anterior dorsal spines and their associated pterygiophores and deformed neural spines in the affected fish. These abnormalities have been considered as an important indicator of environmentally induced stress of the wild fishes. Hence the present finding highlights the need for the closer monitoring of marine environment and to relate the specific factor which causes these abnormalities in fishes.

[Key words: Abnormality, Crescent-shaped indentation, Pearl spot, Parangipettai]

Introduction

Etroplus suratensis (Bloch, 1790) is commonly known as pearl spot and is an indigenous fish extensively found along the east and south-west coasts of Peninsular India[1]. It is essentially a brackish water fish that has become naturally acclimatized to freshwaters. Hence it is an important candidate species for aquaculture in both brackish water and freshwater[2]. It is economically important in fisheries and aquaculture industries in South India[3]. This fish is fairly expensive and is available throughout the year. On account of their unique coloration and remarkable patterns, they are also valued as good ornamental fishes. This is perhaps the first Indian food fish that has been transplanted to any foreign country[4].

Saddleback syndrome (SBS) was expressed as abnormality of the dorsal fin and profile, lack of one to all the hard spines of the dorsal fin, accompanied by shape, number and position abnormalities of the related pterygiophores[5]. It was firstly presented in cultured tilapia, *Oreochromis aureus* by Tave et al., [6]. It has been reported in many fish species[7-11], but there was no report of saddleback syndrome in *Etroplus suratensis*. Hence this study reports the first appearance of saddleback syndrome in the wild species of *Etroplus suratensis* in Parangipettai, Southeast coast of India.

Materials and Methods

Visually deformed *Etroplus suratensis* was obtained from Parangipettai (Lat. 11° 29' N; Long. 79° 47' E) landing centre (Figure 1). Total length and weight of the sample was measured. X-ray photography of the normal and abnormal fishes was taken to identify and compare the deformity.

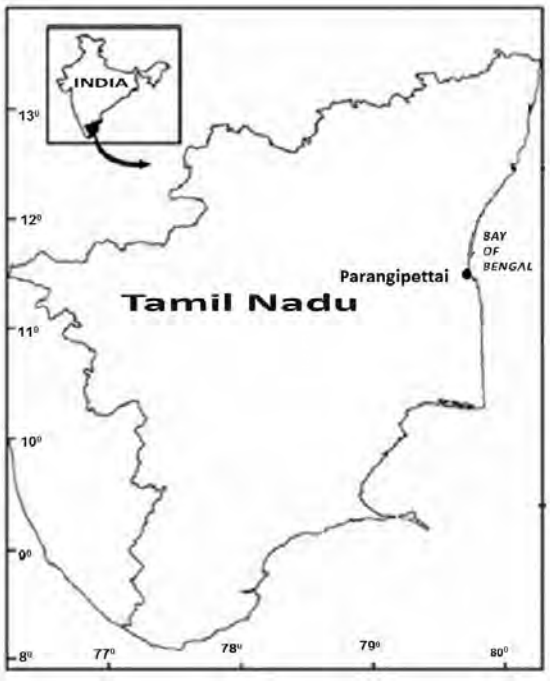

Fig. 1. Study area map

Taxonomy :
Phylum : Vertebrata
Subclass : Actinoptergii
Order : Perciformes
Family : Cichlidae
Genus : *Etroplus*
Species : *Etroplus suratensis* (Bloch, 1790)

Body is deep, short, oval and strongly compressed laterally. Eyes large, mouth small and terminal with a small cleft, teeth villiform, in a single row anteriorly but in one or two rows posteriorly on both jaws, caudal fin is slightly emarginated. Scales are weakly ctenoid. Lateral line is interrupted at 16th or 18th scale, 35 to 40 scales in longitudinal series. Body is light greenish with eight yellowish oblique bands, the first passing through the occipital part of head and last across base of the caudal fin, other six intermediate. Most of the scales above lateral line have a central pearly spot; and possess some irregular black spots on the abdomen. Fins, except the pectorals are bluish or dirty green colour while the pectoral is yellowish with a black blotch at its base[12].

Results

Saddleback syndrome, characterised by a crescent-shaped indentation on the dorsal surface of the body has been occurred in a wild fish species, *Etroplus suratensis* (Figure 2b). The deformed fish was 172 mm in length and 120.36 gm in weight whereas the normal fish (Figure 2a) was 158 mm in length and 107.03 gm. The anterior part of the dorsal fin and pterygiophores was deformed.

Fig. 2. External morphology of *Etroplus suratensis*. (a) Normal fish (b) Abnormal fish

The x-ray analysis also revealed that the anterior region of the dorsal fin and the pterygiophores supporting that was lacking. Anterior three dorsal spines and the pterygiophores were absent. 1st to 13th vertebral spines were also deformed. The radiographs (Figure 3b) shows the absence of the pterygiophores and dorsal fin spines characteristic of SBS, compared to an unaffected individual (Figure 3a).

Discussion

In the present study, *Etroplus suratensis* was visually deformed, anteriorly three dorsal spines and their associated pterygiophores were absent. Koumoundouros[9] also reported similar type of saddleback syndrome in *S. cretense*, in which he found that the SBS manifested as a shorter profile of the dorsal fin with two missing dorsal spines and the associated pterygiophores were also absent.

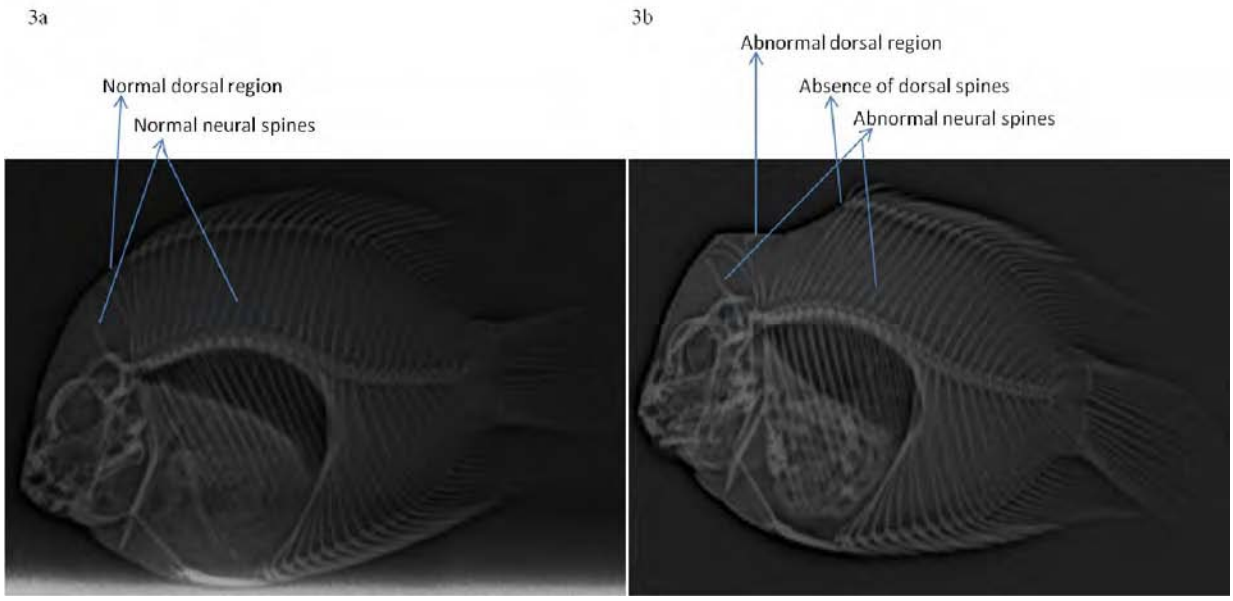

Fig. 3. X-ray photography of *Etroplus suratensis* (a) Normal (b) Abnormal with SBS. Note the absence of pterygiophores and dorsal fin spines at the site of the deformity.

SBS may not significantly affect fish survival; however, factors such as predator avoidance, prey capture and locomotion performance are affected by some skeletal deformities. Fish affected by SBS are more susceptible to stress and less hardy in changing environmental conditions[9].

Almost 12 neural spines were deformed in the pearl spot fish. Similar type of deformities was reported in the silver pomfrets *Pampus argenteus*, in which dorsal fin and its ray showed slight deformation[13]. And he also pointed out that the pterygiophores are absent and the neural spines are highly deformed. Jawad[14] reported similar type of deformities in vertebrae and haemal spines in *Mugil cephalus* collected from New Zealand. SBS is possibly caused by a combination of factors including genetics, water quality, rearing conditions, injury and pollution, or a combination of some of these factors, all of which are known to give rise to deformities in individuals[15]. A wide range of physical, chemical and biological factors causing abnormalities were interfere with the ontogenetic process of the dorsal fin[16].

Several studies reported that SBS observed fish could be exposed by nutritional imbalances including vitamin C and A especially in their early developmental stages[5, 8, 17-18]. Genetic factors like mutations, hybridization or inbreeding can also cause skeletal and fin abnormalities[19-22].Parangipettai coastal water is also well known for pollution by heavy metals and hydrocarbons in water[23-24]; in sediments[25-29]; in fishes and other marine organisms[28-31]. These pollutants could well affect the embryonic stage of the pearl spot and causes these types of abnormalities.

Conclusion

Saddleback syndrome among wild species of *Etroplus suratensis* has not been reported elsewhere; hence this may be the first report on this type of abnormalities in this pearl spot fish. This abnormality may be caused due to pollutions of various sources in this coastal water. An increased incidence of skeletal deformities among these type commercial fish species would suggest environmental deterioration and hence signal the need for prompt remedial action.

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