

Marine Ornamental Fish Biodiversity of West Bengal



Zoology

KEYWORDS : Marine fish, ornamental, diversity, West Bengal.

Dr. B. K. Mahapatra

Principal Scientist and Scientist-in-Charge, ICAR-Central Institute of Fisheries Education, Salt Lake City, Kolkata-700091, India

Dr. W. S. Lakra

Director and Vice-Chancellor, ICAR-Central Institute of Fisheries Education, Versova, Mumbai- 400 061, India

ABSTRACT

The State of West Bengal, India endowed with 158 km coast line for marine water resources with inshore, up-shore areas and continental shelf of Bay of Bengal form an important fishery resource and also possesses a rich wealth of indigenous marine ornamental fishes. The present study recorded a total of 113 marine ornamental fish species, belonging to 75 genera under 45 families and 10 orders. Order Perciformes is represented by a maximum of 26 families having 79 species under 49 genera followed by Tetraodontiformes (5 family; 9 genus and 10 species), Scorpaeniformes (2 family; 3 genus and 6 species), Anguilliformes (2 family; 3 genus and 4 species), Syngnathiformes (2 family; 3 genus and 3 species), Pleuronectiformes (2 family; 2 genus and 4 species), Siluriformes (2 family; 2 genus and 3 species), Belontiiformes (2 family; 2 genus and 2 species), Lophiiformes (1 family; 1 genus and 1 species), Beryciformes (1 family; 1 genus and 1 species).

Introduction

Ornamental fishery, which started centuries back as a hobby, has now started taking the shape of a multi-billion dollar industry. India, having a large number of indigenous fishes of different ornamental attributes has great potential to earn a huge foreign exchange. West Bengal has emerged as a pioneer State in ornamental fish trade of India (Mukherjee *et al.* 2000; Ghosh *et al.* 2003; Singh and Ahmed, 2005). Although the freshwater ornamental fish diversity of West Bengal has been studied by some workers (Ghosh *et al.* 2002; Mahapatra and Lakra, 2012, 2014) but no such study on marine ornamental fish has been made earlier by any workers. The marine resource base comprises 780 km² of inshore area (upto 20 m depth), 1815 km² (between 20 m and 80 m depth) and a continental shelf of 17,049 km² (upto 200 m depth) which harbour 419 marine fish including both food and ornamental fish (Mahapatra *et al.*, 2014, Sanyal *et al.*, 2012).

Materials and Methods

In the present study, random rapid field surveys were conducted during May, 2013- June, 2015 from the different landing centres and harbours of West Bengal coast. Observation of different fish species was made at important fish assembling centres viz. Digha, Sankarpur, Diamond Harbour, and Frazergunge. The information regarding their occurrence was also collected from local fishermen as well as from fish vendors from 33 marine fish landing centres in South 24 Parganas and 41 landing centre in Purba Medinipur district. The ornamental fishes were categorised based on the criteria like colouration, body shapes, banding patterns, finnage, suckers, transparent body and preying habits. The fish specimen was taken to the laboratory for identification and confirmation about the species. For identification Talwar & Jhingran (1991) and Day (1896) are followed. For nomenclature Fishbase (www.fishbase.org) and www.calacademy.org.catalogue was consulted.

Result and Discussion

The study brings about a total of 113 of fish species having ornamentally valuable. They are belonging to 45 families under 10 orders (Table 1).

Table 1: List of Marine ornamental fishes of West Bengal

ORDER 1: PERCIFORMES	
Family 1: Acanthuridae	
1. <i>Acanthurus auranticavus</i> Randall:	Orange-socket surgeonfish
2. <i>Acanthurus bariene</i> Lesson:	Black spot surgeonfish
3. <i>Acanthurus leucosternon</i> Bennett:	Powder blue surgeonfish
4. <i>Acanthurus lineatus</i> (Linnaeus):	Lined surgeonfish
5. <i>Acanthurus nigrofusus</i> (Forsskal):	Brown surgeonfish
6. <i>Acanthurus triostegus</i> (Linnaeus):	Convict Surgeonfish
7. <i>Naso reticulatus</i> (Randall):	Reticulate unicorn fish
8. <i>Zebrasoma velifer</i> (Bloch):	Sail fin tang
Family 2: Carangidae	
9. <i>Alectis ciliaris</i> (Bloch): Pennant	fish/African pompano
10. <i>Gnathanodon speciosus</i> (Forsskal)	Golden trevally
Family 3: Chaetodontidae	
11. <i>Chaetodon auriga</i> Forsskal:	Cross-Stripe Threadfin Butterflyfish
12. <i>Chaetodon collare</i> Bloch:	Red-tail Butterfly fish
13. <i>Chaetodon decussatus</i> (Cuvier):	Indian vagabond butterfly fish
14. <i>Cheilio inermis</i> (Forsskal): Cigar	wrasse
15. <i>Heniochus acuminatus</i> (Linnaeus):	Pennant coral fish
Family 4: Echeineidae	
16. <i>Echeneis naucrates</i> Linnaeus:	Live shark sucker
Family 5: Eleotridae	
17. <i>Eleotris fusca</i> (Forster): Dusky	sleepers
Family 6: Ephippidae	
18. <i>Platax teira</i> (Forsskal): Longfin	batfish

Family 7: Gobiidae

19. *Acentrogobius viridipunctatus*
(Valenciennes): Spotted green goby
20. *Apocryptes bato* (Hamilton): Goby
21. *Boleophthalmus boddarti* (Pallas):
Boddart's goggle-eyed goby
22. *Gobiopsis macrostoma*
(Steindachner): Long jaw Goby
23. *Odontamblyopus rubicundus*
(Hamilton): Red eel goby
24. *Oligolepis acutipennis*
(Valenciennes): Sharp tail Goby
25. *Periophthalmus argentilineatus*
Valenciennes: Barred mudskipper
26. *Taenioides cirratus* (Blyth):
Bearded worm goby
27. *Trypauchen vagina* (Bloch &
Schneider): Burrowing goby

Family 8: Haplogenyidae

28. *Haplogenyis bengalensis*
(Mohapatra, D. Ray & Kumar):
White cheek monocle bream

Family 9: Kyphosidae

29. *Kyphosus vaigiensis* (Quoy &
Gaimard): Brassy chub

**Family 10: Labridae Pteragogus flagellifer (Valenciennes):
Cocktail wrasse**

30. *Anampses caeruleopunctatus*
Ruppell: Blue-spotted wrasse
31. *Pseudocheilinus hexataenia*
(Bleeker): Sixline wrasse
32. *Stethojulis interrupta* (Bleeker):
Cut ribbon wrasse
33. *Thalassoma lunare* (Linnaeus):
Moon wrasse

Family 11: Latidae

34. *Lates calcarifer* (Bloch):
Barramundi

Family 12: Lutjanidae

35. *Lutjanus fulviflamma* (Forsskal):
Dory snapper
36. *Lutjanus johnii* (Bloch): John's
snapper

Family 13: Mullidae

37. *Mulloidichthys flavolineatus*
(Lacepede): Yellow stripe goatfish
38. *Mulloidichthys vanicolensis*
(Valenciennes): Yellowfin goatfish
39. *Parupeneus cyclostomus*
(Lacepede): Gold-saddle goatfish
40. *Parupeneus forsskali* (Fourmanoir
& Gueze): Red Sea goatfish
41. *Parupeneus indicus* (Shaw): Indian
goatfish
42. *Parupeneus trifasciatus*
(Lacepede): Doublebar goatfish

Family 14: Nemipteridae

43. *Nemipterus bipunctatus*
(Valenciennes): Delagoa threadfin
bream
44. *Nemipterus japonicus* (Bloch):
Japanese threadfin bream
45. *Nemipterus nematophorus*
(Bleeker): Doublewhip threadfin
bream
46. *Nemipterus randalli* Russel:
Randall's threadfin bream
47. *Parascolopsis aspinosa* (Rao &
Rao): Smooth Dwarf Monocle
bream
48. *Scolopsis vosmeri* (Bloch): White
cheek monocle bream

Family 15: Ophichthidae

49. *Ophichthus lithinus* (Jordan &
Richardson): Evermann's snake eel

Family 16: Pomacentridae

50. *Abudefduf bengalensis* (Bloch):
Bengal sergeant
51. *Abudefduf sexfasciatus*
(Lacepede): Scissortail sergeant fish
52. *Amphiprion akallopisos* (Bleeker):
Nosestriped anemonefish
53. *Amphiprion clarkii* (Bennett):
Yellowtail clownfish
54. *Dascyllus trimaculatus* (Ruppell):
Three spot damselfish

Family 17: Priacanthidae

55. *Priacanthus hamrur* (Forsskal):
Moontail bullseye

Family 18: Pseudochromidae

56. *Pseudochromis dilectus* (Lubbock):
Dilectus Dottyback

Family 19: Scaridae

57. *Scarus ghobban* Forsskal: Blue-
barred parrotfish

Family 20: Scatophagidae

58. *Scatophagus argus* (Linnaeus):
Spotted scat

Family 21: Serranidae

59. *Epinephelus bleekeri* (Vallant):
Dusky tail grouper
60. *Epinephelus coioides* (Hamilton):
Orange-spotted grouper
61. *Epinephelus faveatus*
(Valenciennes): Indian Grouper
62. *Epinephelus lanceolatus* (Bloch):
Giant grouper
63. *Epinephelus latifasciatus*
(Temminck & Schlegel): Striped
grouper
64. *Epinephelus longispinis* (Kner):
Longspine grouper
65. *Epinephelus malabaricus* (Bloch &
Schneider): Malabar grouper
66. *Epinephelus radiates* (Day):
Oblique-banded grouper
67. *Epinephelus sexfasciatus*
(Valenciennes): Six-bar grouper
68. *Grammistes sexlineatus*
(Thunberg): Golden striped soapfish

Family 22: Siganidae

69. *Siganus argenteus* (Quoy &
Gaimard): Streamlined spine foot
70. *Siganus canaliculatus* (Park):
White-spotted spine foot
71. *Siganus javus* (Linnaeus): Streaked
spine foot
72. *Siganus vermiculatus*
(Valenciennes): Vermiculated spine
foot

Family 23: Sillaginidae

73. *Sillaginopsis panijus* (Hamilton):
Flathead sillago
74. *Sillago sihama* (Forsskal):
Silver whiting

Family 24: Sparidae

75. *Acanthopagrus berda* (Forsskal):
Gold silk sea bream

Family 25: Terapontidae

76. *Terapon jarbua* (Forsskal): Jarbua
terapon
77. *Terapon puta* (Cuvier): Small-
scaled terapon

Family 26: Uranoscopidae

78. *Ichthyoscopus lebeck* (Bloch &
Schneider): Long nosed stargazer

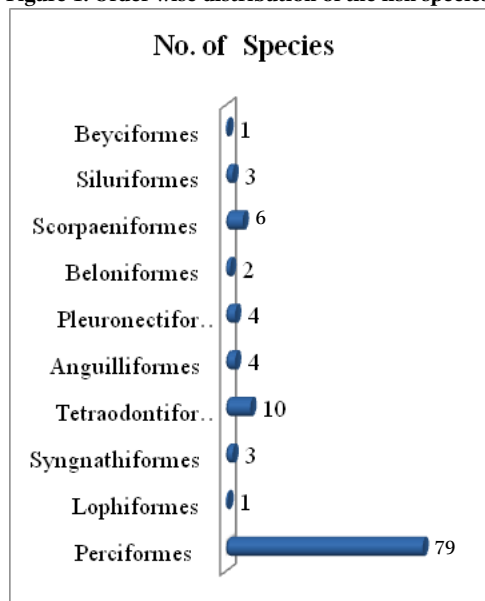
ORDER 2: LOPHIIFORMES

Family 27: Antennariidae 79. <i>Antennarius hispidus</i> (Bloch & Schneider): Shaggy angler
ORDER 3: SYNGNATHIFORMES
Family 28: Centriscidae 80. <i>Aeoliscus strigatus</i> (Gunther): Razor fish
Family 29: Syngnathidae 81. <i>Hippocampus kuda</i> Bleeker: Common seahorse 82. <i>Hippichthys spicifer</i> (Ruppell): Bellybarred pipefish
ORDER 4: TETRAODONTIFORMES
Family 30: Balistidae 83. <i>Balistoides viridescens</i> (Bloch & Schneider): Titan triggerfish 84. <i>Canthidermis maculata</i> (Bloch): Rough triggerfish
Family 31: Diodontidae 85. <i>Diodon hystrix</i> (Linnaeus): Black-spotted porcupine fish
Family 32: Ostraciidae 86. <i>Ostracion cubicus</i> (Linnaeus): Yellow boxfish
Family 33: Tetraodontidae 87. <i>Arothron reticularis</i> (Bloch and Schneider): Reticulated puffer fish 88. <i>Arothron stellatus</i> (Bloch and Schneider): Stellate puffer 89. <i>Chelonodon patoca</i> (Hamilton): Milk spotted puffer 90. <i>Legocephalus inermis</i> (Temminck & Schlegel): Smooth golden puffer
Family 34: Triacanthidae 91. <i>Pseudotriacanthus strigilifer</i> (Cantor): Long-spine Tripod fish 92. <i>Triacanthus biaculeatus</i> (Bloch): Short nose tripod fish
ORDER 5: ANGUILLIFORMES
Family 35: Muraenidae 93. <i>Gymnomuraena zebra</i> (Shaw): Zebra moray 94. <i>Gymnothorax favagineus</i> (Bloch & Schneider): Laced moray 95. <i>Gymnothorax reticularis</i> Bloch: Dusky-banded moray
Family 36: Muraenesocidae 96. <i>Congresox talabonoides</i> (Bleeker): Indian pike conger eel
ORDER 6: PLEURONECTIFORMES
Family 37: Cynoglossidae 97. <i>Cynoglossus arel</i> (Bloch & Schneider): Large scale tonguesole 98. <i>Cynoglossus puncticeps</i> (Richardson): Speckled tonguesole 99. <i>Cynoglossus semifasciatus</i> (Day): Bengal tonguesole
Family 38: Paralichthyidae 100. <i>Pseudorhombus malayanus</i> (Bleeker): Malayan flounder
ORDER 7: BELONIFORMES
Family 39: Exocoetidae 101. <i>Cypselurus poecilopterus</i> (Valenciennes): Yellowing flying fish

Family 40: Hemiramphidae 102. <i>Hyporhamphus limbatus</i> (Valenciennes): Congaturi halfbeak
ORDER 8: SCORPAENIFORMES
Family 41: Platycephalidae 103. <i>Platycephalus indicus</i> (Linnaeus): Bartail flathead
Family 42: Scorpaenidae 105. <i>Pterois antennata</i> (Bloch): Broad-barred fire fish 106. <i>Pterois miles</i> (Bennett): Devil fire fish 107. <i>Pterois radiata</i> Cuvier: Radial fire fish 108. <i>Pterois russellii</i> (Bennett): Soldier lionfish 109. <i>Pterois volitans</i> (Linnaeus): Red lionfish
ORDER 9: SILURIFORMES
Family 43: Ariidae 110. <i>Sciades sona</i> (Hamilton): Sona sea catfish
Family 44: Plotosidae 111. <i>Plotosus canius</i> (Hamilton): Grey eel catfish 112. <i>Plotosus lineatus</i> (Thunberg): Striped eel catfish
ORDER 10: BERYCIFORMES
Family 45: Holocentridae 113. <i>Sargocentron diadema</i> (Lacepede): Crown squirrelfish

The order wise distribution of marine ornamental fish species is shown in the form of bar diagram in figure 1.

Figure 1: Order wise distribution of the fish species number



Marine ornamental fish keeping become popular among the hobbyist of West Bengal. Trading marine ornamental fish has been regularly observed in weekly ornamental fish market at Gallif Street, Kolkata as well as daily fish market in Dasnagar, Howrah (Mahapatra *et al.*, 2015.). To meet the demand of the hobbyist the marine ornamental fish are brought from Chennai, Andaman and Nicobar island, Lakshadweep island or import from overseas market especially from Bangkok and Singapore. The price of the marine ornamental fish is quite expensive in the hobby shop of West Bengal and ranging between Rs. 350/- to 4700/- per piece. As observed there is no record for utilisation of locally available marine ornamental fish.

In the present study detailed species name of 113 fish species are provided. All the fish species reflected in this communication are already included as marine ornamental fish and availability also recorded by some worker from the West Bengal coast (Mohapatra *et al.* 2012a; Mohapatra *et al.* 2012b; Yennawar *et al.* 2012a; Yennawar *et al.* 2012b; Mohapatra *et al.* 2013a; Mohapatra *et al.* 2013b; Mohapatra *et al.* 2013c; Mohapatra *et al.* 2013d; Ray *et al.* 2013; Yennawar *et al.* 2013; Ray *et al.* 2014; Ray *et al.* 2015). Although their value known by hobbyist and traders but the local people unaware of this trade hence priced fish species are not utilised as ornamental fish. The fisher either used this fish as food fish or thrown away these living jewels as by catch. Marine ornamental fish has a bright prospect in ornamental fish trade. To boost up the local economy and for self-employment, these native ornamental fishes can play a key role. In this context, participatory involvement with proper co-ordination is needed from all concerned stakeholders.

Conclusion:

It is evident from the present study out of 419 marine fish of West Bengal 113 (27%) ornamental fish species are exploited for their food value or thrown away as bycatch may be sustainably used for ornamental fish trade. An organized trade of these fish species for aquarium purpose will fetch more economic profit for the dependents of the coastal fishery.

Acknowledgement:

REFERENCE

- Day Francis. 1896. The Fishes of India; Vol. 1. Jagminder Book Agency, New Delhi, India. | 2. Ghosh, A., Mahapatra, B. K. and Datta, N. C. 2003. Ornamental Fish Farming- Successful Small Scale Aqua Business in India. *Aquaculture Asia*. VIII (3): 14-16. | 3. Ghosh, A., Mahapatra, B. K. and Datta, N.C. 2002. Studies on Native Ornamental Fish of West Bengal with a Note on Their Conservation. *Environ& Ecology*. 20 (4): 787-793 | 4. Mahapatra B.K, Sarkar U.K, Lakra W.S. 2014. A Review on Status, Potentials, Threats and Challenges of the Fish Biodiversity of West Bengal. *J BiodiversBiopros Dev* 2: 140. doi:10.4172/2376-0214.1000140 | 5. Mahapatra, B. K., Sarkar, U. K. and Lakra, W. S. 2015. Biodiversity of Marine Ornamental Fish in West Bengal Issues of Sustainability and Livelihood Security. *International Day for Biological Diversity. Biodiversity for Sustainable Development*. 22nd May, 2015: 92-96. | 6. Mahapatra, B.K. and Lakra, W.S. 2012. Indigenous ornamental fish diversity of West Bengal Conservation and Management for sustainability. 23rd All India Congress of Zoology & National Conference on Conservation and Management of Faunal Resources for CMFRI, Chennai, 2012: 7-8. | 7. Mahapatra, B.K. and Lakra, W.S. 2014. Ornamental fishes of East Kolkata Wetland, west Bengal, India. *International Journal of scientific Research*. 3(12):76-78, 2014. | 8. Mohapatra, A., Ray, D. and Yennawar, P. 2013a. First record of Nasoreticulatus (Perciformes:Acanthuridae) from Indian waters. *Marine Biodiversity Records*. doi:10.1017/S1755267213000341; Vol. 6; e56; 2013. | 9. Mohapatra, A., Tudu, P. Ray, D. and Yennawar, P. 2013b. First report on the occurrence of four fishes of Family: Nemipteridae from Digha on the east coast of India. *Rec. zool. Surv. India*: 113(Part-1): 145-149, 2013. | 10. Mohapatra, A., Ray, D. and Tudu, P. 2013c. New record of Convict surgeonfish Acanthurus triostegus (Linnaeus, 1758) from North east coast of India. *Rec. zool. Surv. India*: 113(Part-4): 75-77, 2013. | 11. Mohapatra, A., Ray, D. and kumar, V. 2013d. A new fish species of the Genus Haplogennys (Perciformes: Haplogenyidae) from the Bay of Bengal, India. *Zootaxa* 3718 (4): 367-377. | 12. Mohapatra, A., Tudu, P. and Yennawar, P. 2012a. First report of a fish from Family: Antennariidae (Antennariushispidus) from Digha coastal waters, on the east coast of India. *Rec. zool. Surv. India*: 112(Part-2): 123-124, 2012. | 13. Mohapatra, A., Tudu, P. and Yennawar, P. 2012b. A note on occurrence of Yellow-wing flying fish, Cypselurus poecilopterus (Valenciennes, 1847) from Digha, east coast of India. *Rec. zool. Surv. India*: 112(Part-3): 119-120, 2012. | 14. Mukherjee, M., Chattopadhyay, M., Datta, S. K. and Biswas, S. 2000. Problems and prospects of aquarium fish trade in West Bengal. *Fishing Chimes*. 20(1): 90-93. | 15. Ray, D. and Mohapatra, A. 2013. First report of Brassy chub, Kyphosus vaigiensis (Quoy and Gaimard, 1825) from northern east coast of India. *Rec. zool. Surv. India*: 113(Part-4): 71-73, 2013. | 16. Ray, D., Mohapatra, A., Biswas, S., Satpathy, K. K. and Mishra, S. S. 2015. First record of the Evermann's eel, Ophichthus lithinus (Actinopterygii: Anguilliformes: Ophichthidae), from northern Indian Ocean. *Acta Ichthyologica et Piscatoria* (2015) 45 (1): 89-93. | 17. Ray, D., Tudu, P. and Mohapatra, A. 2014. First report of three surgeon fishes (Family: Acanthuridae) from Odisha, India. *J. Bombay Nat. Hist. Soc.*, 111(1), Jan-Apr 2014: 54-57. | 18. Sanyal, A.K., Alfred, J.R.B., Venkataraman, K., Tiwari, S.K. and Mitra, S. 2012. Status of biodiversity of west Bengal: 1-969+35 Plates (Published by the Director, Zool. Surv. India, Kolkata). | 19. Singh, A. K. and Ahmed, S. H. 2005. Ornamental Fish Culture in Bihar: Prospects as a Cottage Industry. *Fishing Chimes*. 25(6): 9-18. | 20. Talwar, P. K. & Jhingran A.G. 1991. Inland fishes of India and adjacent countries. Volumes I & II, Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi. pp. 1158. | 21. www.calacademy.org.catalogue, 1st November, 2014. | 22. www.fishbase.org. 1st November, 2014 | 23. Yennawar, P., Tudu, P. and Mohapatra, A. 2012a. First report of Stargazer Ichthyoscopus lebeck (Bloch and Schneider, 1801) from Digha coast, India. *Rec. zool. Surv. India*: 112(Part-3): 117-118, 2012. | 24. Yennawar, P., Ray, D. and Mohapatra, A. 2012b. Occurrence of Pennat coral fish, Heniochus acuminatus, (Linnaeus, 1758) (Perciformes: Chaetodontidae) along Digha, coast of India. *Rec. zool. Surv. India*: 112(Part-3): 121-122, 2012. | 25. Yennawar, P., Tudu, P., Ray, D. and Mohapatra, A. 2013. New records of two reef fishes Gymnothorax reticularis, Bloch, 1795 (Family: Muraenidae) and Scarus ghobban, Forsskal, 1775 (Family: Scaridae) from West Bengal coast, India. *Rec. zool. Surv. India*: 113(Part-1): 129-135. |