



Glimpses on Marine Ornamental and Shell Fish Resources of India

A K Pathak, S. P. Singh, Ravi Kumar and Reeta Chaturvedi

National Bureau of Fish Genetic Resources
Canal Ring Road, Post - Dilkusha, Lucknow (Uttar Pradesh), India
Email : pathakajey@gmail.com

Introduction

Identification of an biological organism and documentation of biological diversity is a primary step towards any research work, management, conservation and trade. Among the aquatic faunae fishes are the most diversified group as they occupy different niches in various ecosystem and their morphological features and genetic makeup exhibit great variations. Marine fishes are those fishes which spent at least part of their life cycle in sea. The study on marine fish biodiversity of India is still in infancy stage and also incomplete. In terms of marine environment, India has a coastline of 8,129 km, an exclusive economic zone of 2.02 million km² adjoining the continental regions and the offshore islands and a very wide range of coastal ecosystems such as estuaries, lagoons, mangrooves, backwaters, salt marshes, sandy stretches and coral reefs (Venkatraman and Wafer *et al.*, 2005). Globally 32300 fish species have been reported (Froese *et al.*, 2012) out of which around 9 % found in Indian waters. In India, the marine ecosystem alone contributes around 65% of the total fish biodiversity reported from India. The NBFGR database on the marine fish resources reports 1518 species of finfishes. The marine fishes have large varieties and some of the important fish varieties

belong to pelagic fishes like sardines, anchovies, mackerels, carangids, demersal fishes like rays, sciaenids, perches, silver bellies, lizard fishes, catfishes, sharks, Bombay duck, ribbon fish, seer fishes, tunas etc. The multi species fishery of India comprises of over 250 commercially important fin fishes and 350 ornamental fishes.

It is subtle to describe ornamental fishes. They are generally selected based on their body color (preferably attractive), body shape (unique shape compared to food fishes), and aquarium suitability. The increasing popularity of keeping ornamental fishes in home aquaria in several countries, has substantially increased the trade for these fishes. It has been estimated that the world trade on ornamental fishes is around US \$ 4.5 billion per annum (Srivastava, 1994), with a growth rate of 8% per annum; of which freshwater ornamental fish trade forms about 85%. India's contribution to the world trade of ornamental fishes was about Rs. 10 crore (Srivastava, 1994) and almost the entire trade is based on freshwater ornamental fish. Thus, there is considerable scope for initiating and developing export of marine ornamental fish from India (Tomey, 1985) and to initiate exploitation and export of these fishes. The National Seminar on "Planning Export Strategy of Indian Marine



Fishes" recommended the development of export of ornamental fish (Anon. 1988). The marine ornamental fishes are inhabitants of coral and rocky areas and also among marine plants. They are abundant in the Gulf of Mannar, Palk Bay and Gulf of Kutch along the mainland coast and in the Lakshadweep and Andaman islands. Among all these regions, the lagoons and reef flats in the Lakshadweep group of islands are the richest both in regard to number of species and their numerical abundance (Murty and Sri Ram chandra, 1989; Vijayanand and Varghese, 1990). In a pioneering study on ornamental fishes done by Central Marine fisheries Research Institute, Kochi, India 165 marine ornamental fish species were identified and reported from Lakshadweep and documented in the publication "Marine ornamental fish resources of Lakshadweep". In Gulf of Mannar 113 marine ornamental finfish species were recorded and their biomass was assessed. Andaman and Nicobar islands contributes more than 250 ornamental fish species out of total 1200 species identified.

Over the past two centuries, knowledge about the marine fisheries has been increased in multi-folds. The Fish Base, a completely relational database (<http://www.fishbase.org>) reports 1737 marine fishes from India out of 32300 species globally. On the other hand, the Catalog of Fishes database (<http://research.calacademy.org/ichthyology/catalog>) reports 50,000 available species names of fishes, with more than 31,000 of them currently regarded as valid species. New marine species are being described at a rate of about 100-150 per year, with freshwater numbers slightly higher. In addition, over 10,000 generic names are available ones of which 3,118 are deemed valid for marine fishes (as of Feb. 19, 2010). FishWisePro (<http://www.fishwisepro.com>) is another a comprehensive, fully relational fish database of more than 99,350 scientific species name combinations and over 34,300 well-identified (mostly marine) fish pictures (Dennis Polack). Mora *et al.*, 2006, 2009 and Mora 2008, used records from the Ocean Biogeographical Information System (OBIS) database (<http://www.obis.org>) to estimate the completeness of the global fish inventory through the extrapolation of species discovery curves. They estimated that the global inventory is about 79% complete, or that 21% of marine

fishes remain to be discovered, based on about 15,700 currently known. In the present study, a different approach is used, involving analysis by families of fishes and their distribution and biology, analysis of geographic areas and basins, and descriptions of new species through time, and from various habitats.

Estuaries and backwaters are ideal home for variety of shell fish organisms. Some of the shell animals use this as permanent habitat and many other use as nursery or breeding ground. Globally, more than 30,000 marine crustacean species have been reported. Crustacean fishery is one of the major resources of our country that include the commercially important shrimps, prawns, lobsters and crabs and also the other major groups like stomatopods, branchiopods, cephalocarids, ostracods etc. which are important in the tropical food chain of the marine ecosystem. The marine crustacean resource of India includes 923 species. Among the marine crustaceans, penaeid shrimp constitute the backbone of Indian seafood export industry as the major foreign exchange earner as well as source of livelihood for millions of fishermen in the country. Molluscs on the other hand are one of the most diverse groups of invertebrate animals - both in form and habitat. The invertebrate phylum Molluscs with more than 90,000 species is second only to arthropod in number of species. In India we have more than 1650 molluscan resources. Molluscs including the Cephalopods, gastropods, mussels, oysters, abalones, clams, cockles and scallops contribute to the molluscan fisheries of India.

In the present communication, we attempted to collect the information and knowledge about the marine ornamental and shell fish resources of our country and document the information on these resources in the form of a digital database as we found that there is no database in our country on these integrated resources, which could provide the substantial information. The significant feature and importance of the web version of our database, which was developed under a study to provide the information on the marine ornamental and shell fish resources of our country caters to different professional such as ichthyologists, research scientists, fisheries managers, zoologists and even fisheries academicians.



In our web version database, we have included 333 marine ornamental fishes, 121 molluscan and 84 crustacean with its scientific name, common name, synonyms, taxonomic features, images, habitat, biology and other features pertaining to each species (Pathak A.K. 2011).

List of Ornamental and shell fishes in the database

To prepare the checklist of ornamental and shell fishes from marine ecosystem of India we collected the information through our planned surveys studies conducted in different coastal regions especially in the Gulf of Mannar, Andaman and Nicobar islands and Lakshadweep islands as well as other secondary data published resources. At present, our database contains information on 333 marine ornamental fishes, 121 molluscan and 84 crustacean species.

Availability and access of the database

The database has been opened to the public through URL http://www.nbfg.res.in/marine_ornamental that provides information on categories like taxonomy, biology, geography. In addition database has been supplemented to provide the general information

and other information on fish species. The database was designed in SQL Server 2000 and was integrated with ASP.Net under Windows operating environment to provide the web version for access. We have also included the multimedia digital photo library with general information in our database.

Utility and importance of our database in biodiversity

Emergence of database technologies and advancements have provided ample opportunities to address the challenging task of biodiversity documentation and management electronically and disseminate the information to the end users. We found that development of database on marine ornamental and shell fishes from Indian waters was one of the requirement of our country in the context to Convention on Biological Diversity. We understand that this is the only database in India which provides exclusive information on marine ornamental and shell fishes resources. We also provided the facility in our database to the authenticated end users to voluntarily contribute the information about marine ornamental fishes, crustaceans and molluscs.

References

1. ANON. 1988. Planning Export Strategy for Indian Marine Fisheries, Seafood Export J., 20 (5) : 11-16.
2. VENKATRAMAN K. & MOHIDEEN WAFAR 2005. Coastal and marine biodiversity of India, Indian Journal of Marine Sciences, 34(1) : 57-75.
3. FROESE, R. and PAULY D. Editors. 2012. FishBase. World Wide Web electronic publication. www.fishbase.org, version (04/2012).
4. SRIVASTAVA, L S. 1994. Ornamental fish New export opportunities. Yojana November 15, 22.
5. TOMEY, W. A 1985. Survey in the Union Territory of Lakshadweep, the Bombay and Madras area: Promotion and export trade of Indian ornamental fishes from marine as well as freshwater origin and ornamental water plants. Report to CBI, the Netherlands and Marine Products Export Development Authority, Cochin.
6. MURTVY, V. SRIRAMACHANDRA. 1969. Catalogue of fishes (excluding from the Laccadives) in the reference collections of the Central Marine Fisheries Research Institute, Bull. cent. mar. Fish. Res. Inst, 10 : 36 pp.
7. MURTVY, V. SRIRAMACHANDRA. 1989. Marine ornamental fishes of India, Central Marine Fisheries Research Institute
8. VIJAYANAND, P. E. AND T. J. VARGHESE. 1990. Notes on marine ornamental fishes from Lakshadweep. Seafood expo J., U (4) : 13-18.
9. PATHAK, A. K. 2011. A data repository website on marine ornamental finfishes and shell fishes from Indian waters, Indian Journal of Geo Marine Sciences, 40(4) : 502-508.
10. Mora C, Andrefouet S, Costello M.J, Kranenburg C, Rollo A, Vernon J, Gaston K.J, Myers R.A 2006 Coral reefs and the global network of marine protected areas. Science. 312, 1750-1751.
11. Mora C (2008) A clear human footprint in the coral reefs of the Caribbean. Proc R Soc Lond B Biol Sci 275: 767-773.
12. Mora C, Myers R, Pitcher T, Zeller D and others. 2009 Management effectiveness of the world's marine fisheries. PLoS Biol 7:e1000131
13. <http://www.fishbase.org>
14. <http://research.calacademy.org/ichthyology/catalog>
15. <http://www.fishwisepro.com>
16. <http://www.obis.org>