

## INTRODUCTION

*Badis badis*, *Nandus nandus*, *Colisa fasciatus*, *Colisa lila*, *Puntius ticto*, *Puntius sophore* were once available in plenty during 1940s and 1950s throughout northern and north eastern India and Bangladesh as food fishes. Recently with the developing hobby of ornamental aquarium fishes, demand of the Chameleon dwarf *Badis badis* along with other ornamental fishes grew tremendously. A total of 346 freshwater ornamental fishes have been recorded from India. West Bengal contributed 176 indigenous ornamental fishes comprising 51% (Mahapatra *et al.*, 2014).

Gradual disappearance of the wetlands along the northern and southern parts of Ganga-Brahmaputra basin due to various anthropogenic factors, population of these smaller ornamental fishes was severely affected. Post partition of Indian subcontinent population pressure increased from 40 crores to 120 crores, erection of dams and barrages on the major rivers and tributaries, agricultural revolution after 1960 with the application of chemical fertilizer and pesticide, fast industrial growth and urbanization releasing waste in the wet environment ,are the major causes of disappearance of the many species of smaller Ichthyofauna.

Present dissertation enjoys the privilege to deal with an important Perciformes fish, *Badis badis*. Supposed to have a primitive evolutionary history. The Badidae family is supposed to be evolved in South-East Asian river during Cenozoic-Miocene period when there was no existence of India and Himalayan mountain not to speak of Ganga Brahmaputra basin. Reputed Ichthyologists like Kullander and Brizzi.(2002), Ruber *et al.*,

(2004), from Europe and America took great pain and labour to stress the origin, evolution and speciation of Badidae by travelling the Ganges –Brahmaputra river basin. They also covered the South – East Asian countries like South-East Tibet and China, Arakan –Barma, Shyam (Thailand), Malaysia and Vietnam. Their findings were based on the solid contribution of the eminent geologists to be mentioned with honour like Brookfield, 1998, Gregory, 1925, and Zeitler *et al.*, 2002. During the Mid-Miocene to Early Eocene period major tectonic movements in the eastern Tibetan plates and Indo-burma plates were responsible for the changes in the Paleo-geographic reverine courses in South-East Asia specially the Tsangpo, Mecong, Chindwin, Irrawaddy and Brahmaputra. In the late Eocene tectonic movement Brahmaputra got connected with Tsangpo and Irrawaddy. Later, Irrawaddy got separated from Tsangpo and Brahmaputra (Bharma and Krishnakumar, 1987) leading to the probable speciation in the family Badidae. According to Myers *et al.*, 2000. The Indo-Barma region (North-East India – Myanmer) is said to be one of the world's leading 'biodiversity hotspot'. According to Myers *et al.*, 2000, the India-Burma region by (North-East India –Myanmar), is said to be one of the world's leading Biodiversity Hotspot.

In the late Eocene Brahmaputra in Assam moved further West entering Barak Valley to meet river Meghna one of the oldest river of the east in Indian subcontinent. Here we find speciation in the family Badidae eg. *Badis assamensis*, *Badis kanabos* and *Badis blosyrus*. Later, Brahmaputra moved further moved westward in the early Holocene and ultimately united with river Ganges (Padma) and the genus *Badis* got enormous scope to spread throughout the vast Ganga-Brahmaputra basin and their

numerous tributaries to spread over from Bengal (Undivided) to U.P. and Punjab in the west and Nepal-Bhutan in the North. And here we find further speciation in the family Badidae eg. *Badis badis* and *Badis dario* (Kullander and Britz, 2002, Hamilton 1822).

River Ganges contributes hundreds of tributaries largest of which is the river Bhagirathi-Hooghly, all draining southwards to Bay of Bengal forming the largest Delta of the world-the Gangetic Delta. Ganga tributaries, both in the north and in the south forming unique flood plains in entire Indian Subcontinent. And it is Hamilton first (1822) recorded and named hundreds of Ichthyofauna from these flood plains. He first discovered *Badis badis* from Bengal flood plain though we named it differently at that time.

In the northern part of Ganga, we have two important flood plains:

1. Kosi –Mhananda and Mahananda-Tista-Torsa flood plain.
2. In the south of Ganga is the very Important flood plain-Bhagirathi-Ichhamati flood plain in the Indian part.

Older eminent Ichthyologists, still surviving , are of the opinion that fifty –sixty years ago plenty of *Badis badis* (Bhada) along with *Nandus nandus* (Nados), *Puntius* spp., *Colisa* spp., *Ambalipherringodon mola*, *Panchus panchus* and many other smaller fishes of the Anabentoid and the carp group as common food fishes were found in abundance particularly in late monsoon months (Mahapatra *et al.*, 2005).

The dwarf Chameleon fish *Badis badis*, now becoming rare, gained importance as costly ornamental aquarium fish as well as export fish. Hamilton describe this species without preserving any specimen. To avoid confusion with the similar congeners Kullandar and Britz (2002) designated it a neotype, collect from The Tumapao river, a tributary river of Bhagirathi 65 km north of Kolkata. It is also known to be native to Nepal and Bangladesh.

In order of sharp decline of this ornamental fish, large scale seed production of *B. badis* commonly inhabits paddy fields, small streams and are found to be distributed in all the North-Eastern status of India (Mahapatra *et al.* at 2004). Studies leading to domestication and breeding of *B. badis* will help to sustained fisheries and presumption of its germplasm. Indiscriminate capture of *B. badis* from natural habitats has led to population depletion. For captive domestication, breeding and culture of the species, detailed eco-biological information is important but unfortunately studies in this aspect is awfully lacking.

With a view to above, the present research work entitled “Biology, Captive Maturation and Breeding of Chameleon Dwarf, *Badis badis* (Hamilton, 1822)” has been undertaken in laboratory conditions. It included studies on the general biology, feeding biology, reproductive biology, captive maturation, breeding and larval rearing of *Badis badis*, which would help in further standardization of induced breeding and larval rearing

## **OBJECTIVES OF THE STUDY**

- To study the morphology and anatomy of *Badis badis*.
- To study the feeding and reproductive biology including breeding, fecundity and spawning behaviour of *Badis badis*.
- Standardization and development of captive maturation, breeding and seed production *Badis badis* to conserve this endanger fish.