CHAPTER 1: GENERAL INTRODUCTION

Aquatic environment provides numerous resources that support human life in different ways. Food remains the basic need of humankind for survival. Traditionally fish has been a source of cheap and nutritious food besides being a major foreign exchange earner. Aquaculture has emerged as a major frontier of fish production in the developing countries both for domestic consumption and for export (Nammalwar, 1997). Fishing pressure continues to increase in the inland waters of Benin even though studies and reports have revealed over-exploitation of some of the most important species (Laleye et al., 2003, 2007; Montchowui et al., 2008). Many fish species are in decline and some have become endangered due to a combination of overexploitation, aquatic pollution and habitat modification. Fish is important in the diets and livelihoods of many poor people suffering from vitamin and mineral deficiencies (Roos et al., 2007). Fish are included under super class Pisces, cold blooded aquatic animals and the largest group of vertebrates. The numbers of currently recognized fish species is about 21,000 in the world. Fishes are regarded as one of the most beautiful creation of due to their body pattern and colour (Pandey & Shukla, 2007). Some of the fish species are regarded as an ornamental fish, which are attractive and colourful species which can be kept in confined with controlled environmental condition.
The diversified Indian aquatic environment harbors about different species of fishes. The country fish species have promising market as ornamental fish. Fishes are probably the most important food item as well as for their aesthetic value. As such special emphasis have been given in farming and captive breeding of freshwater as well as marine ornamental fishes in different parts of the globe. These species are being harvested at greater volumes and fetching higher rates, threatening the viability or sustainability of this fishery across various parts of the world (Vagelli & Erdmann 2002; Cato & Brown 2003; Lunn & Moreau, 2004).

World trade of ornamental fishes has reached more than one billion dollars and is growing rapidly at around 10% per year. India is the third largest producer of fish in the world and the fishery sector is a major foreign exchange earner, which accounted for US$ 1.64 billion during 2005-06. Besides providing affordable nutrition to the rural people, fish simultaneously guarantees the livelihood of around 11 million people of the country MPEDA (2007). India currently exports only around Rs. 30 million (US$650,000 million) of ornamental fish. Ornamental fish is one of the important items among the various types of commercially important fishes marketed nationally and internationally. Ornamental fishes, popularly known as ‘aquarium fish’, or ‘live jewel’, are exported to 27 countries, which amounted to 2568 Mt (0.86 per cent of the total marine export) in terms of quantity and US$14 million (0.50 per cent of total marine export) in terms of value (MPEDA, 2007).
In Assam there are several native species suitable for the ornamental fish trade. These include *Botia dario, Channa stewartii, Channa barca, Gagata cenia, Hara hara, Garra species, Mystus sp. Somileptes gongata, Nemacheilus botia, Macrognathus aculeatus, Mastacembelus pancalus, Rasbora species, Danio species* and many others. At present there is no organized trade in Assam (Das & Kalita, 2003). About 95% people of the north east are fish eater. Most of the 296 fish species available in NE region are captured from their wild habitat (Vishwanath et al., 2007.). Among them many wild fish species particularly the air-breathing forms are ideally suited for stocking in derelict ponds and wetlands. All the North-Eastern States, namely, Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura, are gifted with vast aquatic resources which are harbouring diverse ornamental fishes with immense commercial importance and can that have great potential in the ornamental trade and many of which are attractive to foreign markets. Although North-Eastern states produce a bulk of the India’s ornamental fish exports, the region still remains relatively untapped for the development of ornamental fisheries (Mandal et al., 2007). There is great potential to expand the local industry.

The vast and varied freshwater habitats northeastern part of India are the home to an astonishing variety of fishes and has been recognized as one of the freshwater fish biodiversity hotspot in the world (Kottelat & Whitten, 1996). Of this large number of fishes, Biswas et al. (2007) described 93 species of fishes from this region suitable for aquarium rearing. Assam is gifted with many extensive water bodies commonly
known as beels (Jhingran & Pathak, 1987) that are the only source of fish for the poor people in the surrounding villages.

A good number of them have been collected from the wild waters and made available to the domestic and overseas market for trade. Considering its vast potentiality, mass culture of indigenous ornamental fishes for the global market could be one of the most viable alternative sources of livelihood for the rural masses of the region. Further, unsustainable mode of resource exploitation coupled with human induced habitat alteration threatened the natural fish population including the ornamental one of the region.

Within the Cyprinidae, rasborins are the second species-rich group and is composed of Rasbora and related genera, viz. Boraras, Horadandia, Rasboroides and Trigonostigma (Kottelat & Vidthayanon 1993; Kottelat & Witte 1999). The Danioninae are a species-rich subfamily distributed over much of tropical Africa and South and East Asia, including several genera of uncertain composition and phylogenetic position (Nelson, 2006). The Cyprinidae are the most species-rich family of fishes and consequently also of vertebrates, with about 220 genera and 2420 species placed in up to 11 subfamilies, including the Acheilognathinae, Barbinae, Cultrinae, Cyprininae, Danioninae, Gobioninae, Labeoninae, Leuciscinae, Squaliobarbinae, Tincinae and Xenocypridinae (Nelson, 2006), well represented in Eurasia, Africa and North America.
Esomus danricus and Parluciosoma (Rasbora) daniconius are commonly known as Indian flying barb and stripped rasbora respectively and both the species are widely distributed in the Indian sub-continent and south-east Asian countries. The two species share similar habitats, usually found in slow moving water and also in paddy fields, ponds, road side shallow drains etc. In Assam, they are fairly common in their abundance and probably the two most important food fish in rural areas. Due to their colour, size and playful behaviour, they are also highly rated as aquarium fish. As per CAMP report (1998) Esomus danricus is included under “Lower Risk least concern” (LR-lc) category and Parluciosoma daniconius is not evaluated (NE).

Esomus danricus (Indian flying barb) is distributed in Indian subcontinent. Prefer to live in wetland, water logged bodies, paddy fields, pond, road side ditches.

Taxonomical classification:

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Kingdom:</strong> Animalia</td>
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<tr>
<td><strong>Genus:</strong> Esomus</td>
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<tr>
<td><strong>Species:</strong> E. danricus (Hamilton1822)</td>
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Parluciosoma (Rasbora) daniconius (Stripped rasbora) is found in Indian subcontinent and South-east Asian countries, commonly in wetland, side pools of river on the flank of sandy mud or hilly-stream.

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STATEMENT OF PROBLEM

1. Fishes are probably the most important food item as well as for their aesthetic value. As such special emphasis have been given in farming and captive breeding of freshwater as well as marine ornamental fishes in different parts of the globe.

2. A good number of them have been collected from the wild waters and made available to the domestic and overseas market for trade illegally.
3. Considering its vast potentiality, mass culture of indigenous ornamental fishes for the global market could be one of the most viable alternative sources of livelihood for the rural masses of the region.

4. Except a handful of native ornamental species, no comprehensive report is available pertaining to habitat ecology, feeding and breeding biology as well as commercial farming practices.

5. Unsustainable mode of resource exploitation coupled with human induced habitat alteration threatened the natural fish population including the ornamental one of the region.

**OBJECTIVES OF THE PRESENT STUDY**

1. To study the habitat ecology of the selected ornamental fish species.

2. To study some selected aspects of feeding biology.

3. To study some selected aspects of reproductive behaviour.

4. To study the captive rearing and breeding of *Esomus danricus* and *Parluciosoma (Rasbora) daniconius* fish species

5. DNA barcoding of *Esomus danricus & Parluciosoma (Rasbora) daniconius*
REFERENCES:


