Chapter 1

INTRODUCTION

The Northeastern region of India (NER) with its diversified lotic and lentic water bodies are considered as the global hotspot for fish bio-diversity. Out of the approximately 806 fish species inhabiting fresh waters of India (Talwar and Jhingran, 1991), the NER including Nagaland is reported by 266 species (recorded and reported) belonging to 114 genera under 38 families and 10 orders (Sen, 2000). The NER, which is gifted with twin river systems, the Brahmaputra and the Barak drainages, also receives some tributaries of Irrawaddy river (Chindwin drainage) of Myanmar passing through the region, which made NER a lucrative zone for ichthyological importance.

In sharp contrast to the investigations made on the fish and fisheries of other Indian river system, works on the Nagaland drainages are surprisingly very meagre. Of late, however, Nath (1982, 1986, 1991), Nath and Dey (1982a, b), Kar and Dey (1982, 1991, 2002) and Dey and Kar (1989, 2002) have made some contributions on the fish and fisheries related to Barak drainages of India.

Nagaland, with an area of 16,579 km² lies between 25° 6’ and 27° 4’ N latitudes and between 93° 20’ and 95° 15’ E longitudes. This montane state being formed of young hills is devoid of any plateau or tableland. Nagaland is mainly hilly with an altitude ranging from ca 615 m to 3840 m. Patkai range, the highest mountain range in the state attaining a height of 3840 meters above sea level (m.asl) at Saramati traverses the extreme high hill ranges,
separating the state of Nagaland from Myanmar and also acts as watershed between the rivers of India and Myanmar. This montane state of NER is dissected by a number of seasonal and perennial rivers and rivulets with V-shaped valley in between. Nagaland has rich inland water resources in the form of rheophilic rivers and streams besides a small Shilloi lake in Phek district with an area of c 5.0 ha and a large Doyang reservoir in Wokha district with water area of c 2258 to 3500 ha at seasonal intervals. There are as many as eleven major and ten minor rivers circumventing into eleven districts besides myriads of purls and streams in this montane state of NER purporting her ichthyic potentialities (Map).


The ethological perspectives of the fishes mainly their locomotive, ingestive, and procreatic behaviour have drawn the attention of various scientific workers (Gray, 1953;

In South East Asia, of late, focus has been drawn towards the culture and breeding on fresh water fishes. Contributions in this field are that of Choudhury (1962a,b); Sinha (1972); Dixit and Agarwal (1974); David and Rahman (1975); Chaco and Kuriyan (1984); Barua and Mollah (1987); Akteruzzaman et al. (1991), Abidi and Thakur (1997); Mahapatra (1999, 2004); Sarkar and Ponniah (2000); Choudhury and Biswas (2003) and Mitra (2004).

Indeed, some studies have been made in India namely, by Basavaraja et al., (1988); Tekruale and Rao, (1990); Sinha, (2000); Mukhopadhya, (2001); Srivastava and Swarup, (2001); Sinha et al., (2001); Anna Mercy, (2001); Pandian et al., (2001) and Swain and Das, (2001) on the food, nutrition and rearing of some freshwater fishes. And studies of captive breeding of freshwater tropical fish species by the use of hormone are few (Choudhuri, 1955; Lam et al., 1975; Reddy et al., 1990 and Paul, 2005). However, it was probably Dey and Sarmah (2000); Sarmah and Dey (2000, 2003 and 2004); and Sarmah (2001, 2002 and 2003) who have made empirical studies on the breeding of some native fresh water fish species of NER hitherto remained unattended.

The snow trouts, mountain barbels or Indian trouts are found from Iran to China, encompassing India favouring mountainous areas but occasionally in lowlands. *Schizothorax richardsonii* (Gray) commonly called as ‘alwan snow trout’ in English is a
principal food fish and is generally distributed along the Himalayas from Jammu and Kashmir to NER of India including Nagaland. *Schizothorax richardsonii* (Gray) inhabits the entire networks of snow and spring fed rivers, rivulets and streams of the Himalayas at an altitude of from 270 m and above msl. And in Nagaland *Schizothorax richardsonii* (Gray) is found in the water bodies at upper reaches only. *Schizothoracids* represent the native dominant group of fishes in the snow – fed rives of Sikkim and Garhwal Himalayas and *Schizothorax richardsonii* (Gray) forms a major component of subsistence and commercial fisheries throughout the region (Seghal, 1999; 2000 and Dey et al 2002) including Nagaland. Apart from its numerous food values, the fish also has value as sport fish and ornamental at juvenile stages.

The state of Nagaland, which is endowed with myriad of rheophilic gills and purls, affords a lucrative field for the development of *Schizothorax richardsonii* (Gray), which is found to be her most important rheophilic fish species. Besides, this snow trout is reportedly the highest ranked among the freshwater fishes of Nagaland due to its special flavour and its beautiful slender shape. Smoked *Schizothorax richardsonii* (Gray) is a very coveted dish to the delicacy of the Naga populace.

The population of *Schizothorax richardsonii* (Gray) is under steady decline in India especially in Nagaland due to various factors like, alteration of habitats, increase silt and debris from the catchments, aquatic pollution, over exploitation and destructive fishing by dynamite, bleaching powder and other toxicants and channel drying which is why, the species has been listed among the threatened fishes of the country. Consequently, *Schizothorax richardsonii* (Gray) has become a higher risk threatened species in North
Eastern India (Biswas 2004) and reasonably endangered in West Bengal and Bangladesh (Pal et al. 2003). According to Bhattacharjya et al. (2000a) many valuable fish species caught from the wild are reportedly being exported from the NER causing a decline in their wild stock rapidly. The present trend, if allowed unabated, Schizothorax richardsonii (Gray) may be completely wiped out from nature in days to come.

Conservation and management of Schizothorax richardsonii (Gray) is therefore, warranted. In this perspective a thorough scientific study is required to address the above-mentioned problem. Accordingly the present study has been undertaken to explicate the systematics and biology especially breeding biology of Schizothorax richardsonii (Gray) from Nagaland water bodies hitherto remained to be investigated.

For convenience, the materials and procedures followed in studying different facets of parameters have been given in respective chapters. The present investigation, it is humbly felt, will depict a clear scenario of Schizothorax richardsonii (Gray) as a potential fresh water fish of Nagaland in particular and North Eastern India in general especially on the systematics and on the technology of captive breeding and culture with their bionomics and early life history which in turn will lead to economic benefit of aquarists already engaged in and for entrepreneurs as well as unemployed youths interested in taking up freshwater fish trade and help generate income sources among the masses. As Schizothorax richardsonii (Gray) has a high food demand in Nagaland, the present findings can also be used for taking up its mass culture in a commercial scale under the eco-climatic condition of the region by competent authorities. This in return will help accentuate the conservation strategies of this natural marvel from imminent peril caused by natural as well as anthropogenic stress.