A B S T R A C T

The state of Assam is blessed with myriads of riverline and beels which are highly productive ecosystems. Plenty of fishes inhibit in the rivers, ponds, beels and many other wetlands of this area. The fishes are vitally proteinous food for human consumption. Many other health nutrients like fatty acids, vitamins, minerals etc. are provided by fishes. The biochemical composition of fishes are varied by the changes of environment, season, age, sex etc. Especially the small fishes are more appreciated by the rural poor people due to their ease of availability and comparatively lower price. Large popular fishes are too costly to be included in the regular diet of poor people. Owing to their high market value these have already gained importance in the field of commercialization as well as scientific investigation. Previous literatures witnessed a lot of nutritional excellance of the big fishes. But so far the small fishes were less studied inspite of good nutritional contents possessed by them. The present study aimed at the estimation of nutrient contents of ten small fishes mostly consumed by the Bodo Communities of Kokrajhar District, Assam , which are commercially not so much exploited.

The aims and objectives of the present work were to study the diversities of small fish species in Kokrajhar District, to study the proximate composition, amino acid profile, fatty acid profile, mineral and vitamin contents of the ten small fish species .The study focused at the nutritional importance of highly consumed selected small fishes.

A detailed survey of various water bodies of the Kokrajhar District was carried out for one year. The selected fish species were properly identified with the help of standard keys. The vernacular names of the fish species were collected by questioneries with local people and fisherman as well as from the Govt. of fisheries Kokrajhar branch. The IUCN red list of threatened species, 2010 were honestly followed up for the evaluation of the conservation status of the fish species. Fresh species of the fishes were bought from the local markets in the Kokrajhar town. They were stored in clean polythene bags and carried to the laboratory as early as possible. The morphological analysis of the fish species were done following standard method. The fish species were dressed, beheaded, deskinned and filtered as per manual followed by thorough washing with distilled water. All the fillets of the fish samples were minced, homogenized, packaged, labeled and kept in the refrigerator until analysis. Fishes were thawed and the bone and skin were separated from the flesh to carry on the proximate analysis. The contents of moisture, ash and crude lipid of the fish species were determined following Food Safety and Standards Authority of India (FSSI) Lab. Manual, 2015. The protein contents of the fish species was determined by the method of IS:7219:1973 (RA 2005). The Carbohydrate contents of the fish species were determined according to AOAC (1995). The amino acid contents were determined by using High Performance Liquid Chromatography (HPLC) (method QA.15.510/AOAC 19th edition). Mass Spectrometry (GC/MS) (method QA.996.06/AOAC 19th edition) was employed to determine the fatty acid contents in the fish species. Atomic Absorption Spectroscopy (AAS) (method AOAC 19th edition) was employed for the determination of the contents

of Fe, Zn and Ca in the fish species. UV-Visible Spectrophotometer (UV-Vis) (Method IS:1482.8:200) was employed for quantitative determination of Phosphorous contents in the fish samples. High Performance Liquid Chromatography (HPLC) (Method QA:16.5.3/AOAC 19th edition) was employed for determination of Vitamin A and D in the fish samples. To investigate the physicochemical parameter of water habitats, the samples were collected from the local ponds, beels and river in a pre-cleaned polyethylene bottles. The water quality parameters included pH, temperature, TDS, alkalinity, BOD, COD, DO, turbidity and salinity. The experimental analysis of the water samples had been followed by APHA 22nd edition.

The study of ichthyofaunal diversity of the fish species reported that quantitiativily seventy seven ichthyo species belonged to 53 genera, 26 families and 9 orders from the different water bodies of Kokrajhar district of BTAD, Assam, India. Amongst the ten fish species, *Channa gachua* and *Macrognathus pancalus* contained the highest (19.85 g/100g) and the lowest (14.26g/100g), contents of protein respectively. The presence of fair amounts of protein contents in the selected fishes witnessed the species to promote the nutritional qualities of the consumers when included in their and the lowest (1.58g regular diet. The highest lipid contents (11.09g/100g) was shown by the fish species, *Chanda nama* by *Xenentodon cancila* The variations in the lipid contents of the small selected fish species revealed the differences caused by the changing life cycles and also changing ecological conditions. The highest moisture value was contained by *Rasbora daniconius* (77.21%) and the lowest (68.12%) by *Chanda nama*. The highest ash contents (5.79g) was found in *Macrognathus pancalus*. All the selected fish species were experimented to show low carbohydrate contents. The amino acid profiling of the selected fish species revealed the presence of non essential amino acids like Alanine, Aspartic acid, glycine, serine, tyrosine in less quantity. Fair contents of glutamic acid in *Barilius Vagra* was resulted by the current study. The highest contents (10.0%) of histidine was found in Colisa fasciata. Threonine was found to be present in highest amount (8.67%) in *Channa gachua*. All the selected fish species were found to contain good compositions of amino acids. A total numbers of 39 individual fatty acids had been analysed for the selected small fish species. Amongst them palmitic acid was detected to be predominantly high in all the fish species. The present study indicated that the selected fish species might not be regarded as highly fatty fishes. The experimental analysis of Iron, Zinc, Calcium and Phosphorus in the selected fish species resulted that the species *Collsa fasciata* contained highest contents of Fe (18.23mg/100g), P(3520mg/100kg) and Ca (1640mg/100kg) whereas *Amblypharyngodon mola* contained the highest contents of Zn (4.73mg/100g) amongst all. All the species contained fair contents of the studied minerals and hence could be vitally important for the proper functioning of human body. In the present study the small fish *Rasbora daniconius* contained the highest amounts of Vitamin A(1644.38µg/100g) and Vitamin D (32.20µg/100g). The study of physicochemical parameters of the water habitats in the present study concluded that the studied water bodies were suitable for the aquatic lives. Adequate measures should be taken for the healthy living of fish species.

The present work on the selected small fishes revealed that the fish species carried good nutritional values. All of the species were nutritionally competitive with the common big fishes. The

market value of these small fishes are lower than that of some big fishes available in this area. Proper utilization of the small fishes will enhance their commercial values. Rural poor people will be ensured about the nutritional benefits of the small fishes by the present study. As a whole the health awareness might be concerned deeply to the rural poor people by the proper knowledge of the nutritional contents of the available small fish species of the studied area.