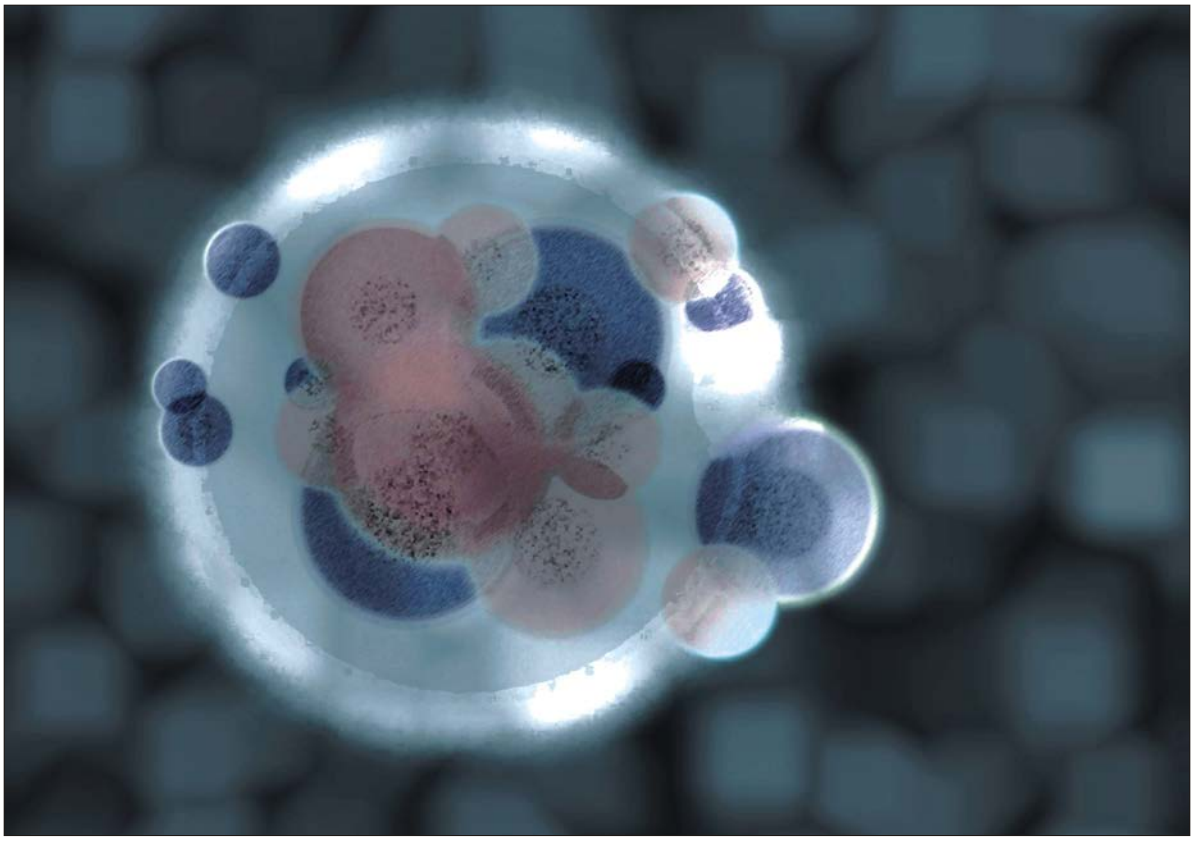

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Biochemical Assessment of Selected Fresh Fish

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Abstract: Ten fresh fish samples of different species (*Mugil cephalus, Setipinna phasa, Coilia dussumieri, Scatophagus argus, Sillanopsis panijus, Arius caelatus, Hilsa ilisha, Polynemus paradiseus, Platicephalus indicus and Pelamys chiliensis*) collected from Kuakata, Bangladesh were assessed biochemically (proximate composition, total volatile basic nitrogen, tri-methyl amine and pH). Moisture content of fresh fish varied over a range from 65.33 to 78.92%. Likewise, protein (8.58 to 19.06%), fat (6.12 to 12.99%) and ash (1.07 to 8.41%) content indicated wide variation in the ten fresh fish analysed. TVB-N and TMA-N values of fresh fish were found ranging between 10.92±0.23 to 25.75±0.80 mg N 100 g $^{-1}$ and 7.70±0.67 to 18.50±0.77, respectively. The values of pH of the samples ranged from 7.03±0.05 to 6.7±0.07.

Key words: Freshwater fish, TMA-N, TVB-N, pH

INTRODUCTION

Nutritional quality of a food is very important. The nutritional importance of seafood has increased substantially because of beneficial effects of eating seafood fats and oils. Seafood is also an important source of high-quality and highly digestible protein and a respectable source of essential minerals (Nettleton, 1992). The nutritional quality of seafood is affected by body part of the seafood being consumed, method of handling, processing (including cooking at home), season of harvest, sex and species (Krzynowek, 1988).

Fish accounts 63% of the animal protein supply in Bangladesh (DOF, 2001). During the year 1999-2000, Bangladesh exported 39,391 metric ton fish and fisheries products (EPB, 2001). Amongst total export volume and export earning, dried products (Dry fish, Salted & dehydrated fish and Shark fin and Fish Maws) accounted to 1286.00 MT (DOF, 2001).

Consumption of fish provides an important nutrient to a large number of people world wide and thus makes a very significant contribution to nutrition. The total food supply available from fisheries (marine and inland) would give an apparent availability, as a live-weight equivalent, of about 13 kg year^{-1} for each of the world's inhabitants. Availability in developed countries is 27 kg per capita while it is only 9 kg per capita in developing countries (James, 1998). Nevertheless, developing countries have a greater nutritional dependence on fish. There are 61 countries that derive more than 20% of their animal protein supply from fish; only very few are developed countries (James, 1998).

Proximate composition illustrates the nutritional quality of food. Measurement of TVB-N and TMA-N indicate the freshness of fish. Biochemical assessment is necessary to ensure the nutrition value as well as eating quality of the fresh fish. Inadequate work has been done on the biochemical assessment of fresh fish in Bangladesh. The present investigation was carried out in order to evaluate the biochemical parameters (proximate composition, TVB-N, TMA-N and pH) of fresh fishes.

MATERIALS AND METHODS

Fresh fish caught from deep sea and landed in Kuakata in the south-western region of Bangladesh were purchased from the Arot (Assembler). The fresh samples were kept in insulated icebox with sufficient ice. All the collected samples were brought to the Quality Control Laboratory of Fisheries and Marine Resource Technology Discipline of Khulna University by road transportation for investigation. As soon as the samples were received in the laboratory, they were stored at –20°C in deep freeze for biochemical investigation.

Proximate composition (the percentage of moisture, protein, fat and ash) of collected samples were analysed according to AOAC (1988) methods.

Total volatile basic nitrogen (TVB-N) and trimethyl amine nitrogen (TMA-N) was determined according to Conway (1977) micro-diffusion technique. Slight modification was done to meet the requirement of the present investigation.

RESULTS AND DISCUSSION

Geographical and environmental features influence the proximate composition of fresh fish. Pigott & Tucker (1990) described the proximate composition of

Table 1: Proximate composition of 10 fresh fishes

Species (Local name)	Scientific name	Moisture (%)	Ash (%)	Protein (%)	Fat (%)
Parshe	*Mugil cephalus*	70.83	1.7	21.38	6.12
Phasa	*Setipinna phasa*	78.99	2.78	8.58	9.65
Boiragi	*Coilia dussumieri*	76.61	2.97	11.75	8.67
Bistara	*Scatophagus argus*	75.74	2.42	15.58	6.26
Tular danti	*Sillanopsis panijus*	72.46	2.39	14.19	10.96
Gang tengra	*Arius caelatus*	65.33	8.41	19.06	6.79
Ilish	*Hilsa ilisha*	67.21	1.9	17.6	12.99
Taposhi	*Polynemus paradiseus*	76.02	1.07	15.97	6.94
Chat baila	*Platicephalus indicus*	74.31	2.12	17.03	6.54
Kankon	*Pelamys chilieusis*	77.57	2.35	10.05	10.03

Table 2: TVB-N, TMA-N and pH of ten fresh fish

Species	Scientific name	TVB-N (mg N 100 g^{-1})	TMA-N (mg N 100 g^{-1})	pH
Parshe	*Mugil cephalus*	20.50±0.48	13.51±0.30	6.77±0.15
Phasa	*Setipinna phasa*	24.67±0.51	17.98±0.43	6.7±0.07
Boiragi	*Coilia dussumieri*	23.27±1.34	16.33±0.68	6.83±0.06
Bistara	*Scatophagus argus*	16.30±0.77	12.58±0.77	6.93±0.06
Tular danti	*Sillanopsis panijus*	12.15±0.67	9.93±0.67	6.73±0.05
Gang tengra	*Arius caelatus*	25.75±0.80	18.50±0.77	7.03±0.05
Ilish	*Hilsa ilisha*	22.17±0.75	17.35±0.81	6.93±0.05
Taposhi	*Polynemus paradiseus*	10.92±0.23	7.70±0.67	6.8±0.12
Chat baila	*Platicephalus indicus*	12.92±0.96	8.90±0.54	6.77±0.05
Kankon	*Pelamys chilieusis*	19.02±0.67	14.42±0.67	6.73±0.05

numerous species. Although protein and ash contains tend to remain constant through the year (Table 1), variations occur which reflect the species, season and location. Similar results related to proximate composition of fresh fish were observed by Paul (1994). The present investigation indicates similar pattern and the results were correlated.

TVB-N content of the ten fresh samples varied between 10.92±0.23 to 25.75±0.80 mg N 100 g^{-1}. Almost similar pattern of result was observed for TMA-N content (7.70±0.67 and 18.50±0.77). It was observed that out of ten fresh samples, seven showed comparatively higher TVB-N value (16.30±0.77 to 25.75±0.80 mg N 100 g^{-1}). The sample Taposhi (*Polynemus paradiseus)* indicated a much lower content of TVB-N (10.92±0.23 mg-N 100 g^{-1}) in comparison with the other fresh samples. These TVB-N values were much lower than acceptable limit which ranged between 30 – 40 mg N 100 g^{-1} (Connell, 1976).

The results indicated that TMA-N content of fresh fish followed a similar pattern with TVB-N of that species. TMA-N values of all ten fresh fish studied varied between 7.70±0.67 to 18.50±0.77 mg N 100 g^{-1}. The highest TMA-N (18.50±0.77 mg N 100 g^{-1}) content was found in sample Gang tengra (*Arius caelatus*). However, three samples Phasa (*Setipinna phasa*), Gang tengra (*Arius caelatus*) and Ilish (*Hilsa ilisha*) exceeded the standard limit (10-15 mg N 100 g^{-1}) of acceptability. pH of the ten fresh fish varied between 6.7±0.7 to 7.03±0.5.

It is concluded that the ten fresh fish species, studied indicated a wide variation related to proximate composition (moisture, ash, protein, fat), TVB-N, TMA-N, pH, respectively.

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