

Biochemical analysis of Five Dried Fish species of Bangladesh

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Abstract: To assess the proximate composition, five dried fish samples of *Mystus vittatus*, *Channa punctatus*, *Chanda nama*, *Corica soborna* and *Trichuirus haumela* were selected. The moisture content ranged from 14.06% to 24.58%, protein varied between 44.08% to 65.65% (moisture basis) and 53.45% to 76.39% (dry matter basis), lipid content of the selected dried fishes ranged from 1.91% to 17.76% (moisture basis) and 2.31% to 21.54% (dry matter basis). Ash content varied from 9.63% to 22.73% (moisture basis) and 11.21% to 28.15% (dry matter basis). The experiment was replicated three times and conducted from February, 2009 to August, 2009. Samples were collected from Sayedpur Upazaila, Nilphamari District, the north-west region of Bangladesh.

Key Words: dried fish, moisture, crude protein, lipid and ash

Introduction

Freshwater fishes play a vital role for animal proteins in the world. Approximately 16 percent of animal proteins consumed by the world's population are derived from fishes, and over one billion people depend on fish as their main source of animal proteins (FAO, 2000). Fishes are easily digestible nature of proteins and are important source of essential minerals. Besides, the dried fishes are also rich in other nutritional components (Nettleton, 1992; Graikoski, 1998; Basu and Gupta, 2004). Laureti (1998) established that dried fishes often are an alternative to fresh fishes in many places. According to DoF (2011) significant amount of dried fishes (approximately 622 mt) were exported and earned 25.06 core taka of foreign currency. But many cases it does not possible to get similar flavor, taste or texture from dried fishes. Saha (2003) reported that in Bangladesh most of the market samples become slightly odourless and some lose the shelf life where rancid and bitter tastes are developed. Nutritional composition also varied in large scale in different dried fish product. Now-a-days consumer wants to know and ensured the nutritional value of the products what they are eating. Although a good number of works on the biochemical composition of fishes in Bangladesh have been done by many researchers viz. Rubbi *et al.* (1987), Mollah *et al.* (1998, 2000), Nurullah *et al.* (2002, 2003), Islam *et al.* (2003), Mazumder *et al.* (2008). But the dried fishes both freshwater and marine species were not focused. So the present investigation was carried out in order to assess the percentage of proximate composition of five fish species through laboratory analysis.

Materials and methods

Five dried fish species eg. tengra (*Mystus vittatus*), taki (*Channa punctatus*), chanda (*Chanda nama*), kachki (*Corica soborna*) and churi (*Trichuirus haumela*) were collected from the local dried fish market of Saidpur upazilla under Nilphamari district, which is the biggest dry fish market (both wholesale and retail) of the north-west region of Bangladesh. The people of this area prefer dried fishes to even fresh fishes. Collected samples were brought to the Aquaculture Laboratory of the Faculty of Fisheries, Bangladesh Agricultural University, Mymensingh, Bangladesh. The samples were taken to the laboratory, stored in air tight polythene bags at 4°C until biochemical investigations. Proximate composition (percentage of moisture, protein, fat and ash) of the samples was analyzed according to standard Association of Official Analytical Chemists (AOAC, 1980) methods in triplicate. The experiment was conducted during a period from February to August, 2009.

Results and Discussion

Moisture content (%): The highest moisture content was found as 24.58% in *Corica soborna* and the lowest was 14.06% in *T. haumela*. Detailed moisture percentages in other species are shown in Fig. 1. Haque (2004) stated that normally the sun-dried fishes contain an average of 10 to 20% of moisture. Hussain *et al.* (1992) found that the moisture content varied over a wide range from 12.3-54% in *Labeo ghoniensis*. In the present experiment moisture percentage of the dried fishes were found approximately similar to the referred values. Islam (1982) reported that the moisture content of traditionally dried rui fish was 9.07%. The market samples of sun-dried *Gudusia*

chupra had moisture ranging from 9.61 to 18.64% (Bhattacharyya *et al.*, 1985). Faturoti (1985) showed that the gutted dried and smoked fish samples of African catfish (*Clarias nigrodigitus*) had moisture content as 6.27 to 10.92%. Azam *et al.* (2003) also reported that the range of fourteen selected dried fishes and observed that moisture content ranged from 18.23 to 23.61%.

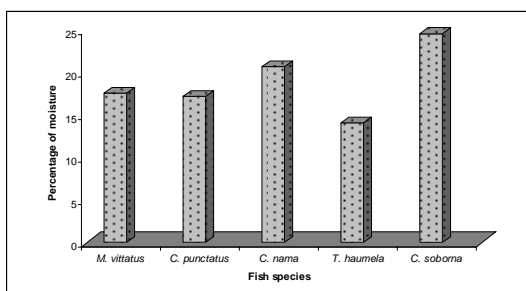


Fig. 1: Moisture content (%) of five dried fish species

Protein content (%): Among the studied five dried fishes, protein content varied between 44.08% (*M. vittatus*) and 65.65% (*T. haumela*) of the moisture basis and 53.45 to 76.39% respectively on dry matter basis. The detailed results (Fig. 2) showed that the value of protein content of all the dried fish species comparable to other parameters of proximate composition. Normally the sun-dried fishes contain 60 to 80% protein (Haque, 2004). Hussain *et al.* (1992) reported that protein content varied widely from 17.2 to 78% in 23 different dried species. Azam *et al.* (2003) found that the protein content varying between 40.69 to 66.52% in fourteen selected dried fish species which were similar to present finding. Traditionally dried rui fish contains 73.26% (Islam, 1982) Faturoti (1985) showed that the gutted dried fish samples of *C. nigrodigitus* had a range of crude protein as 55.02 to 63.05%.

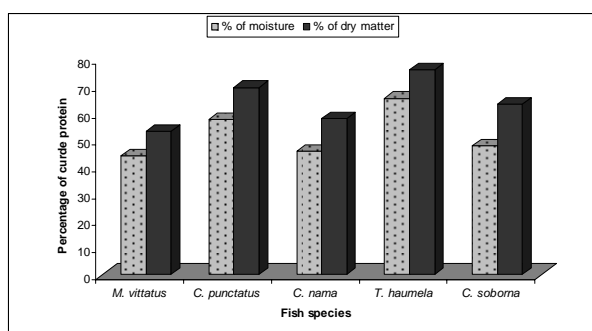


Fig. 2: Crude protein content (%) of five dried fish species

Lipid Content (%): The highest lipid content was found in *M. vittatus* (17.76% based on moisture content and 21.54% on dry matter) and the lowest in

C. punctatus (1.91 and 2.31% based on moisture content and dry matter content respectively) (Fig. 3). Lipid content (%) varied greatly among the dried fish species, which was also reported by worker like Stansby, 1962; Kalamani and Kamasastri, 1998 (3.7-17.8%); Azam *et al.*, 2003 (97.7-26.13%) for other species. Shahiduzzaman *et al.* (2004) reported that the Batashi fish (*Clupisoma atherinoides*) contains 3% lipid. Dried *Rita rita* contains 13.92% lipid (Mollah *et al.*, 1998) and Keshava and Sen (1982) reported that dry fatty fishes contain 7.10% of lipid in average.

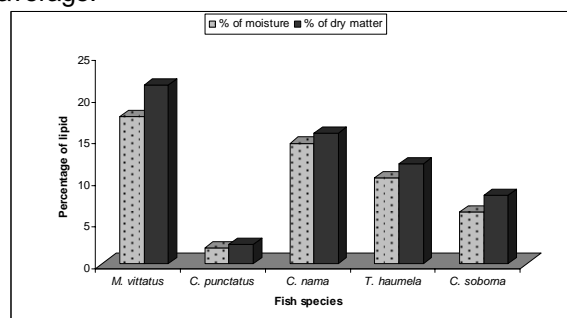


Fig. 3: Lipid content (%) of five dried fish species

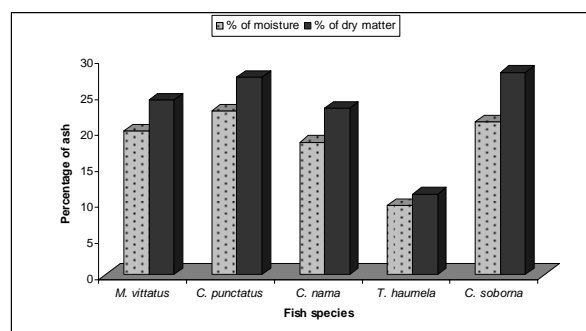


Fig. 4: Ash content (%) of five dried fish species

Ash content (%): The variation of ash content among the studied dried fishes ranged within 9 to 30% on the basis of moisture and dry matter contents. The highest value was found in *C. punctatus* (22.73% against moisture content) and in *C. soborna* (28.15% on dry matter basis), the lowest value was 9.63% on the basis of moisture and 11.21 on the basis of dry matter (Fig. 4). Hussain *et al.* (1992) stated that the ash content varied over a large range 1.4-21.6% in 23 different dried species. Azam *et al.* (2003) found 5.08 to 12.14% of ash content in fourteen dried fishes. Ash content of *Cirrhina reba* was reported to contain 1.7% (Islam *et al.*, 2003).

Conclusion

In tropical country like Bangladesh where relative humidity is always high there is a chance of moisture uptake from the environment by dried fish. In many cases moisture content depends on species variation. It is well known that traditional drying of fishes is often

done in the open field or on the sand. As a result there are chances of contamination with sands and other particles which ultimately increase ash content. However, the results of the present investigation states that the percentage of protein is quite satisfactory in the selected fish species and *M. vattatus* and *C. nama* also contain lipids. From these results, it can be concluded that dried fish, both freshwater and marine can provide satisfactory nutrition to the nation.

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