Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 6, Issue, 02, pp.4965-4967, February, 2014

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

ISSN: 0975-833X

RESEARCH ARTICLE

PROXIMATE COMPOSITION OF SMALL INDIGENOUS FISH (*AMBLYPHARYNGODON MOLA*) TISSUE OF MANIPUR

***[1]Chabungbam Bijayalakshmi, [2]Ngasepam Romen and [1]Maibam Shomorendra**

[1]Fish Disease and Biotechnology Research Laboratory Department of Zoology, Thambal Marik College, Oinam-795134 Manipur, India
[2]Department of Life Science and Bioinformatics, Assam University, Silchar-788011

ARTICLE INFO

Article History:
Received 17th November, 2013
Received in revised form
08th December, 2013
Accepted 29th January, 2014
Published online 21st February, 2014

Key words:
Proximate composition,
Amblypharygodon mola,
Muka-nga, Lipid, Moisture.

ABSTRACT

This study presents the nutritive value of *Amblypharyngodon mola* (Hamilton-Buchanan), locally known as Muka-nga which is a small indigenous fish of Manipur. This fish is eaten as smoked, fried and curried form by the local people. This fish is very tasty and costly as compared to other small fishes. It may be due to its highly nutritive value. The main objective of this study is to estimate the proximate composition of this fish. The lipid content was determined by using Bligh and Dyer method. The total lipid content and moisture content was found to be 77.19% and 5.4% respectively. Further study has to be done to estimate other nutrients from this fish.

Copyright © 2014. Chabungbam Bijayalakshmi , et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Fish is a health-food for many reasons and has been an important part of the human diet in almost all countries in the world. Small indigenous fishes (SIFs), a subset of the total fish and shellfish, contribute greatly to human nutrition. Besides being an important source of proteins, these small indigenous fishes are the rich source of micronutrients, minerals and vitamins. The majority of the fish eaten by the rural poor is the small indigenous fishes and these small fishes are eaten whole, with organs and bones. Small indigenous fishes grow to a size of about 25-30cm in matured or adult stage (Mohanty *et al.*, 2010). In Manipur, there are various small indigenous fishes. These fishes have got highly nutritive value as compared to other fishes. Proximate composition means percentage composition of basic constituents such as water, protein, lipid, carbohydrate and minerals. The energy yielding nutrients like protein, lipid, and carbohydrates are considered as macronutrients which are present in large quantities .Non-energy yielding nutrients like vitamins and minerals are micronutrients and are present in small quantities (Ramakrishnan, *et al.*, 1995). Majority of the nutritionists recommend that human beings should eat fish everyday (Balk, *et al.*, 2004, Blanchet, *et al.*, 2000, Nestel, 2000). Several studies on proximate composition of fish have been made from different parts of the world so far. Majority of the fishes usually consists of about 70-80% of water, 20-30% of protein and 2-12% of lipid (Kalay, *et al.*,1999). Ingesting fish can reduce the risk of heart diseases and lower the risk of developing dementia including Alzheimer's disease (Grant, 1997). Breastfed babies of mothers who eat fish have better eye sight perhaps due to the omega-3- fatty acid transmitted in breast milk. Fish oil may be useful in treating dys-lipidemia in diabetes (Friedberg *et al.*, 1998). Eating fish during pregnancy may help to reduce the risk of delivery of a premature baby (Olsen, and Secher, 2002). The main objective of this research work is to estimate the proximate composition of SIFs of Manipur.

***Corresponding author:** Chabungbam Bijayalakshmi*
Fish Disease and Biotechnology Research La14boratory Department of Zoology, Thambal Marik College, Oinam-795134 Manipur, India.

MATERIALS AND METHODS

Sample Collection

Amblypharygodon mola was collected from fish market, Nambol, Bishenpur District, Manipur and brought to the Fish Disease and Biotechnology Research laboratory, Department of Zoology, Thambal Marik College, Oinam, Manipur

Sample preparation

The fish were washed with running tape water and blotted with blotting paper. The length and weight was measured and recorded. The fish was descaled with sharp blade. The dorso–lateral portion muscle was collected and bones are removed from fish muscle. Then the muscle was dried in oven and ground into fine powder.

Moisture content

The moisture content in the fish tissue was estimated by drying 2g of fish tissue in a hot air oven at 105±5° C for 16 hours. The difference in weight before and after drying is the amount of moisture content and the result was represented in percentage of wet weight of the muscle.

Total lipids

The lipid content was estimated by using Bligh and Dyer method **(**Bligh Dyer, 1959). Lipid was extracted from 500 mg of oven dried tissue with 5ml of chloroform: methanol (1:2) mixture. Then the mixture was vortexed well. The resultant mixture was left for overnight and centrifuged for 10 minutes. The filtered extract was taken in a pre weighed beaker subjected to oven dried. Beaker was weighed with lipids. The difference in weight was taken as total lipid content and percentage was calculated.

Calculation

$$\frac{\text{Weight of the Petridis with sample} - \text{Weight of the empty Petridis}}{\text{Weight of the sample}} \times 100$$

=total lipid %

RESULTS

Amblypharyngodon mola tissue contains 77.19% moisture and 5.4% of total lipid content. This moisture value is in the range of 70% -80% given by (Kalay *et al.*, 1999). This lipid value is very near to 5.8% lipid content found in fresh whole *A.mola* (Wahengbam Sarjubala devi and Ch.Sarojnalini, 2012). High – lipid fishes had less water and more protein than low lipid fishes (Wahengbam Sarjubala Devi and Ch.Sarojnalini 2013). The composition of a particular species often appears to vary from one fishing ground to another and season to season, but the basic causes of change in composition are usually variation in the amount of food it eats and in the amount movement it makes (Murray, *et al.*, 2009).

Table 1. Length and proximate composition of *Amblypharyngodon mola*

Name of the fish	Length(cm)	Moisture percentage	Total lipid percentage
Amblypharyngodon mola	6.4	77.19	5.4

DISCUSSION

Fish production in Manipur is insufficient to meet the demand (Lilabati and Vishwanath 1997). Protein and lipid values of the endemic fishes of Manipur was found to be higher than that of the fresh water fishes of India (Vishwanath, W. and Ch. Sarojnalini 1988). *A.mola* is vitamin A rich fish found in Manipur. Local people eat this fish as a whole. Jafri (1968) reported that lipid content in fresh water fishes were high during November and December (Jafri, 1968). This may be due the ecological conditions and food availability of the fishes. The present study showed the nutritional value of *A.mola* was high. According to Karel (1973), moisture content of fishes which ranges between 20% to 50% does not support active bacterial growth (Karel, M.1973). Fish muscle contains minerals, vitamins and other nutritional compounds which are necessary in a diet (Larsen Thilsted *et al.*, 2000). Small indigenous fish is an important source of Vitamin A as well as calcium in poor rural households (Roos, *et al.*, 2007). According to Ackman, generally fish can be grouped into four categories according to their fat content: lean fish (<2%), low fat (2-4%), medium fat (4-8%) and high fat (>8%). So, *A.mola* contains medium fat (Ackman 1989). Most of the people do not care about the nutritional value but fish is essential food to prevent from life threatening diseases. In Manipur there are so many indigenous fishes which are left for studying nutritional value. Therefore, further study has to be done for finding their nutritional value in time so that nutritionists can easily formulate the fish requirement for daily meal.

Figure 1. Showing the *Amblypharyngodon mola* (Hamilton-Buchanan), Locally known as Muka-nga

Acknowledgement

Authors are grateful to the Principal, Thambal Marik College, Oinam, and Manipur for providing necessary laboratory facilities and Department of Biotechnology, Ministry of Science and Technology, Govt. of India for granting the project.

REFERENCES

Ackman, R.G., 1989. Nutritional composition of fats in sea foods. Prog. *Food Nutr. Sci*., 13:161-241.

Balk, E., M. Chung, A. Lichtenstein, P. Chew and B. Kupelnick *et al.* 2004. Effects of omega-3 fatty acids on cardiovascular risk factors and intermediate markers of cardiovascular disease. Agency Healthcare Res. Qual. (US). Report No.: 04-E010-2.

Blanchet, C., E. Dewailly, P. Ayotte, S. Brueau, O. Receveur and B. J. Holub, 2000. Contribution of selected traditional and market foods to the diet of Nunavik Inuit women. *Can. J. Diet Pract. Res.*, 61:50-59.

Bligh, E.G. and Dyer W.J.A 1959. A rapid method of total lipid extraction and purification. *Can J. Biochem Physiol* .37:911-917.

BP Mohanty, BK Behera and AP Sharma 2010. Nutritional significance of small indigenous fishes in human health.

Friedberg, C.E., M.J. Janssen, R.J. Heine and D.E. Grobbee, 1998. Fish oil and glycemic control in diabetes. A meta-analysis diabetes Care,21:494-500.

Grant, W.B., 1997. Dietary links to Alzheimer's disease. Alzheimer's Dis.Rev.,2:45-55.

Jafri, A.K. 1968. Seasonal changes in the biochemical composition of the common carp, *Cirrhinius mrigala* (Ham.) Broteria, 36:29-44.

Kalay, M., K.A.Y., O., M., Canli, 1999. *Bull. Environ. Contam. Toxicol.* 63:673-681.

Karel, M. 1973. Recent research and development in the field of low moisture and intermediate moisture food. *Crit.Rev.Fd.technol*. 3:329-373.

Larsen T.Thilsted, S.H., Kongsbak, K and Hansen, M. 2000. Whole small fish as a rich calcium source. *British Journal of Nutrition* 83(2):191-196.

Lilabati H. and W. Vishwanath 1997. Biochemical, nutritional and microbiological quality of smoked *Anabas testudinius* brought to Manipur. *J Freshwater Biol.*, 9(1):23-27.

Murray, J., Burt JR. 2009. The composition of fish, *Torry Advisory Note No*.3., 27-2-2009.

Nestel, P.J., 2000. Fish oil and cardiovascular disease: lipid and arterial function. *Am. J. Clin. Nutr.*, 71:228S-231S.

Olsen, S.F. and N.J.Secher, 2002. Low consumption of sea food in early pregnancy as a risk factor for preterm delivery: Prospective cohort study. *Br. Med.J.*, 324:447-450.

Ramakrishnan, S and S. Venkat rao. 1995. *Nutritional Biochemistry.T.R. Publication*, Chennai.

Roos, N., Wahab, M.A., Chamnam, C., Thilsted, S.H. 2007b. The role of fish in food–based strategies to combat vitamin A and minerals deficiencies in developing countries. *The Journal of Nutrition*.137:1106-119.

Vishwanath, W. and Sarojnalini, ch. (1988). Nutritive value of some fishes endemic in Manipur. *Indian J. Fish*. 35(2):115-117.

Wahengbam Sarjubala devi and Ch. Sarojnalini 2012. Impact of different cooking methods on proximate and mineral composition of *Amblypharyngodon mola* of Manipur. *International Journal of Advanced Biological Research*, Vol.2(4):641-645.

Wahengbam sarjubala devi and Ch.Sarojnalini 2013. Estimation of Protein contents of Chocolate Mahseer (*Neolissochilus hexagonolepis*, McClelland) of Iyei River of Manipur. *International Journal of Science and Research*, India .Vol.2 Issue 2.

****