



## Evaluation of nutritive value of local fishes in Wani region, Dist. Yavatmal, (Maharashtra state)

D.B. Khamankar<sup>1</sup>, R.R. Kamdi<sup>2</sup>, A.P. Sawane<sup>2</sup>✉

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### Abstract

In the present investigation an attempt has been made to evaluate nutritive values of local fishes available in Wani area from Nirguda river and Wardha river. The present study was carried out during the period of Nov. 2008 to Oct. 2009. During study the survey, collection, identification and biochemical analysis of local fishes was done. The results of present study showed that all the fishes were rich in protein content, maximum protein content found in *Anguilla bengalensis* 29.34 % and minimum found in *Punctius curmuca* 10.34 %. Lipid contents of fishes were low and varied from 1.23 % in *Rasbora daniconius* to 6.54 % in *Heteropneustes fossilis*. Glycogen content of fishes were negligible and varies from 0.11 % in *Osteobrama cotio* to 0.090% in *Cyprinus carpio*.

**Keywords:** Biochemical analysis, Wardha river, Nirguda river, local fishes. protein, lipid, carbohydrate.

### Introduction

Malnutrition is a big problem in many developing countries. While, deficiencies of vitamin A, iron, iodine and other micronutrients are of great concern of public health all over the world. Their consequences include nutritional blindness, poor learning capabilities, poor growth and increased morbidity and mortality rates. Development and agricultural program including fisheries and aquaculture which is mainstream nutrition issues can go a long way in alleviating the problem of malnutrition in poor countries, (Chilama, 2003).

India can now claim to be self-sufficient in rice and wheat. However, these achievements do not mean that the problem of chronic malnutrition has been solved. To cope up with the challenges of malnutrition in developing countries fisheries can play a vital role in augmenting food supply and raising nutritional level. Fish is a rich source of proteins, fats, vitamins (A, B and D), and minerals such as iron, calcium, zinc, iodine, phosphorus, selenium, fluorine, copper and magnesium. Fish bones can be used as calcium supplements for

human consumption (Phira *et al.*, 2006). Fish roes (eggs) were rich in phosphorous, iron and calcium contents and can be used for making pickles (Balaswamy 2009). Fish manure tended to have a higher content of Mn, Cd, Cr, Pb, Fe and Zn than most other livestock manure. In India potential of fish culture is yet to be fully explored and exploited. Fishes being rich source of proteins and have high nutritive value, the biochemical analysis is very essential to evaluate nutritive values of locally available small indigenous fishes having less commercial values and used by poor communities. In present study the biochemical analysis of fishes in Wani area was done to evaluate nutritional value of local fishes.

There is a wealth of literature available on biochemical composition of various fish species (Balaswamy *et al.* 2009; Balaswamy *et al.*, 2007; Ismail, 2007; Kamal *et al.*, 2007; Balaswamy *et al.*, 2006; Al-Habib, 1990; Kent, 1987; Weatherly and Gill, 1987. *etc.*

### Author's Address

<sup>1</sup> Department of Zoology, Lokmanya Tilak Mahavidyalaya, Wani, (Maharashtra)

<sup>2</sup> Department of Zoology, Anand Niketan College, Anandwan, Warora, (Maharashtra).

E-mail: apsawane@rediffmail.com

### Material and Methods

For the present study two water bodies includes Wardha river and Nirguda river in Wani area was selected for fish collection. Wani is located at co-ordinates 20°07' N latitudes and 78°95' E longitude, at 228 m AMSL (Above mean sea level).



The two spots on Wardha river and two spots on Nirguda river were selected where fishing activities were frequently carried out. Fishes were collected from these selected spots with the help of local fishermen and also from local fish markets. Fish collection was done during the period from November 2008 to October 2009 twice in every month. Fishes were identified up to the species level with the help of standard keys and book, (Day, 1967; Qureshi and Qureshi, 1983; Jhingran, 1997; Daniels, 2002 and Gupta and Gupta, 2006). Immediately after fish collection, photographs were taken with the help of digital camera, on graph paper to know the measurement of fish.

To prepare the sample for the biochemical analysis, the fishes were washed thoroughly with tap water and kept in a slanting position in a tray to remove water. Only the edible portions such as muscles were taken for the experiment. Samples were macerated with tissue homogenizer and used for investigation.

Protein contents were determined by using Lowry, *et al.*, (1951) method. Lipid contents were determined by using Bligh and Dyer, (1959) method. And glycogen contents were determined by Montgomery, (1957) method.

## Results and Discussion

The present investigation deals with biochemical composition of fishes, protein, lipids and glycogen, with an object of understanding the nutritive value of local fishes (Table-I).

### Protein Contents

All fishes were found to be rich source of protein. The maximum and minimum protein contents of muscle among the thirty seven species were 29.74% in *Anguilla bengalensis* and 10.34 % in *Punctius curmuca*. Higher protein contents were found in *Lebeo rohita* 22.21% , *Cyprinus carpio* 21.32%, *L. calbasu* 21.23%, *Channa punctatus* 21.34%., *C. striatus* 21.54% and *Barlilius barna* 19.80%; whereas lower values were found in *Rasbora daniconius* 10.63%, *Punctius sarana* 10.44% *P. ticto* 11.83%, *P. sophor* 10.73% and *Salmostoma bacaila* 11.63%.

### Lipid contents:

In the present study, the lipid content of muscles among the thirty seven species varies from 1.23% in *Rasbra daniconius* to 6.54% in *Heteropneustes fossilis*. Higher lipid contents were found in *Labeo rohita* 5.22%, *Cirrhinus mrigala* 4.62%, *L. calbasa* 4.84, *Rita rita* 4.21, *Calarius batrachus* 4.32% , *Channa punctatus* 4.63%, *C. striatus* 4.61% and *Nandus nandus* 5.39%. While lower lipid contents were found in *Barilius barna* 1.61%, *Cyprinus bendelinsis* 1.34%, *Punctius sarana* 1.85%, *P. sophore* 1.84%, *P. ticto* 1.31, *P. curmuca* 1.48%, *P. amphibius* 1.63%, *Garra mullaya* 1.91%, *Ompok bimaculatus* 1.66%, *O. pobo* 1.42% and *Wallago attu* 1.91%.

### Glycogen contents:

In present investigation, glycogen contents of muscle among all the thirty seven species were found negligible and varies from 0.011% in *Osteobrama cotio* to 0.090% in *Cirrhinus carpio*. Higher glycogen contents were found in *Mystus seenghala* 0.085%, *Cirrhinus mrigala* 0.078%, *Catla catla* 0.076%, *Anguilla bengalensis* 0.076%, *Heteropneustus fossilis* 0.075% and *Punctius curmuca* and *P. amphibius* 0.074%. Whereas lower glycogen contents were found in *Tilapia mossambicus* 0.013%, *Mastacembelus armatus* 0.018%, *Wallago attu* 0.019% and *Rita rita* 0.019%.

The results of present study showed that all the fishes were rich in protein content, maximum protein content found in *Anguilla bengalensis* 29.34 % and minimum found in *Punctius curmuca* 10.34 % . Lipid contents of fishes were low and varied from 1.23 % in *Rasbora daniconius* to 6.54 % in *Heteropneustes fossilis* Glycogen content of fishes were negligible and varies from 0.11 % in *Ostebrama cotio* to 0.090% in *Cyprinus carpio*.

The present investigation deals with biochemical composition of fishes, protein, lipids and glycogen, with an object of understanding the nutritive value of local fishes. These results were in good agreement with previous works of Rahman *et al.*, (1994); Hossain *et al.*, (1999) and Kamal, (2007). These results also nearly similar to FAO, (1991).

Table-I: Body composition of fishes in Wani area

S.N.	Scientific Name	Local Name	Protein %	Lipid %	Glycogen %
1	<i>Notopterus notopterus</i>	Patola	17.43	3.87	0.023
2	<i>Anguilla bengalensis</i>	Tambu	29.74	3.34	0.076
3	<i>Salmostoma bacaila</i>	Chal	11.63	1.82	0.046
4	<i>Barilius barna</i>	Batri	19.80	1.61	0.066
5	<i>Cyprinus bendelisis</i>	Zora	13.34	1.34	0.034
6	<i>Rasbora daniconius</i>	Gana	10.63	1.23	0.026
7	<i>Cyprinus mola</i>	Nawari	19.70	2.44	0.058
8	<i>Osteobrama cotio</i>	Bhodu	11.90	2.21	0.011
9	<i>Punctius dorsalis</i>	Kodsi	12.63	2.76	0.039
10	<i>Punctius sarana</i>	Karwadi	10.44	1.85	0.032
11	<i>Punctius sophore</i>	Karwadi	10.73	1.84	0.037
12	<i>Punctius ticto</i>	Tepri	11.83	1.31	0.036
13	<i>Punctius curmuca</i>	Bhurungi	10.34	1.48	0.074
14	<i>Punctius amphibius</i>	Ghuruti	16.46	1.63	0.074
15	<i>Garra mullaya</i>	Mahir	17.82	1.91	0.044
16	<i>Cirrhinus mrigala</i>	Mrigal	19.37	4.62	0.078
17	<i>Catla catla</i>	Katla	18.62	3.25	0.076
18	<i>Labeo calbasa</i>	Karoti	21.23	4.84	0.048
19	<i>Labeo rohita</i>	Rohu	22.21	5.22	0.059
20	<i>Cyprinus carpio</i>	Cipla	21.32	3.96	0.090
21	<i>Rita rita</i>	Bhokni	14.61	4.21	0.019
22	<i>Mystus cavasius</i>	Katwa	13.12	3.84	0.021
23	<i>Mystus seenghala</i>	Singat	17.75	3.45	0.085
24	<i>Ompok bimaculatus</i>	Barangi	14.84	1.66	0.023
25	<i>Ompok pobo</i>	Waddi	13.92	1.42	0.021
26	<i>Wallago attu</i>	Sawda	15.65	1.91	0.019
27	<i>Clarias batrachus</i>	Mangur	16.31	4.32	0.063
28	<i>Heteropneustes fossilis</i>	Ingur	18.34	6.54	0.075
29	<i>Xenotodon cancella</i>	Chocha	15.26	2.93	0.022
30	<i>Ambasis nama</i>	Zanjad	16.81	2.56	0.038
31	<i>Ambasis ranga</i>	zanjad	16.22	2.37	0.042
32	<i>Nandus nandus</i>	Dukkar	13.61	5.39	0.024
33	<i>Tilapia mossambicus</i>	Telabi	16.47	2.31	0.013
34	<i>Glossogobius girus</i>	Kaddu	15.53	2.33	0.066
35	<i>Channa punctatus</i>	Mallar	21.34	4.63	0.044
36	<i>Channa striatus</i>	Dhadak	21.54	4.61	0.064
37	<i>Mastacembelus armatus</i>	Bamb.	18.51	3.92	0.018

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