



## Study of Diversity, Size and Consumption of some Small Fishes in Patna

• Kriti • Pragati Sinha • Srishti  
• Joyita Das

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Corresponding Author : Joyita Das

**Abstract :** *Small fishes are an important source of animal protein in our diet. Its consumption and availability needs to be monitored. The study was aimed at estimating people's choice and the small fishes available in a fish market in a prime location in Patna. Results indicate that small fishes are preferred by lesser percentage of people as compared to big fishes. Majority prefer both small and big fishes. Nine types of small fishes were observed during the course of study. Their dimensions vary due to time of study.*

**Keywords:** *Small fishes, Diversity, Size, Consumption.*

### Kriti

B.Sc. III year, Zoology (Hons.), Session: 2014-2017,  
Patna Women's College, Patna University, Patna,  
Bihar, India

### Pragati Sinha

B.Sc. III year, Zoology (Hons.), Session: 2014-2017,  
Patna Women's College, Patna University, Patna,  
Bihar, India

### Srishti

B.Sc. III year, Zoology (Hons.), Session: 2014-2017,  
Patna Women's College, Patna University, Patna,  
Bihar, India

### Joyita Das

Assistant Professor, Deptt. of Zoology,  
Patna Women's College, Bailey Road,  
Patna-800 001, Bihar, India  
E-mail : joyitadas11@gmail.com

### Introduction:

Fish plays an important role in fighting hunger and malnutrition as being rich food for poor people. Fish is not only a source of proteins and healthy fats, but also a unique source of essential nutrients, including long-chain omega-3 fatty acids, iodine, vitamin D, and calcium. The multiple benefits of fatty fish high in omega-3s and small fish eaten whole containing nutrients in the skin and bones clearly illustrate seafood's irreplaceable nutritional value. Small fish is an integral part of our diet, providing an important source of animal protein and healthy fats for much of the world's population, and should be a key element of every food security and nutrition strategy. Many small fish families are found in Bihar like Bagridae, Belonidae, Cyprinidae, Siluridae, etc. Bihar is rich in small fish fauna represented by *Cirrhinus reba*, *Labeo bata*, *Oxygaster bacaila*, *Mystus tengara*, *Mystus bittatus*, *Ompak pabda*, *Gadusia chapra*, *Labeo gonius*, *Puntius sp.* and *others*. The nutritional benefits of small fish consumption are also particularly important for people living with HIV/AIDS. Small fishes are also rich in iron, zinc, magnesium, phosphorous, calcium, vitamin A and vitamin C. Small low-value fishes, which are largely consumed by the poor, provide more minerals than the same quantity of wheat or large fishes, as they are consumed whole, with the bones intact. Over 90% of global inland capture fisheries production is used for human consumption, the majority of which is in the developing world (*Welcomme et al. 2010*). For example,

fish account for 50% of all animal protein consumed in Bangladesh (Thilsted et al. 1997). Low-income food-deficit countries account for 80% of the total reported harvest from inland capture fisheries (Kapetsky 2003). India has 7517 kilometres of marine coastline, 3,827 fishing villages, and 1,914 traditional fish landing centres. India's fresh water resources consist of 195,210 kilometres of rivers and canals, 2.9 million hectares of minor and major reservoirs, 2.4 million hectares of ponds and lakes, and about 0.8 million hectares of flood plain wetlands and water Bodies (India National Fishery Sector Overview, 2006). Fisheries Sector is contributing to the socio economic development of India. It is a source of over 14 million people. The total fishermen population as per Livestock Census, 2003 was 14,485,354, which include 4,696,158 males, 4,033,963 females and 5,755,233 children. Fishermen engaged full time in fishing operations were 933,124 and part time were 1,072,079 (Handbook on Fisheries Statistics, 2014). In India, there are about 1.45 million fishers, and another 10 million people in fishing related business, including processing and marketing. Bihar is endowed with rich aquatic and fisheries resources in the form of rivers, flood plains, wetlands (chaurs), oxbow Lakes (Mauns), reservoirs, tanks and ponds. The main culture fishery resources of Bihar lie in over 43,000 ponds and tanks of variable sizes covering a total area of about 65,000 ha distributed throughout the length and breadth of the State (Fisheries Policy, 2008). Thus, fisheries play a very important role in the socio economic development of a country in fighting hunger and malnutrition. These inland fisheries contribute about 25 percent to the world production of fish (Sugunan et al, 2007). Bihar is a landlocked state where ornamental fishes are not paid much attention except a few species. Several ornamental fishes are yet to become popular as per Dey (2006). Bihar having natural resources in the form of wetlands, River, Tanks, Oxbow lakes, etc., in which many ornamental fishes are found inhabited. Bihar has rich aquatic resources, but due to its poor management only 40 % water bodies are used for traditional aquaculture and remaining 60 % are left undeveloped. Small fishes can sometimes serve as a solution to existing health problems. The small fishes, generally eaten whole, have multiple benefits, since their skin and bones contain nutrients.

## Materials and Methods:

For the selection of area of study on small fishes, we visited several fish markets situated in Patna. We settled to conduct our study in fish market situated in Boring road since it was placed at a prime location in the middle of the city. People from various areas visit it daily. The sale is high. Fishes sold in this fish market are fresh water fishes, directly coming all the way from nearby banks of river Sone, Ganga and Gangetic Ghats and from local ponds. It is a well established fish market as compared to others and well organised too. Fresh fish samples were collected from the study area thrice a week; i.e every Monday, Wednesday and Friday. On every Sunday we conducted our questionnaire since on this day the market was most crowded. The collected samples of small fishes were brought to the lab for measurements. They were weighed with the help of a pan balance. Their lengths were measured with the help of a thread and a standard scale. The fish was kept on clean table spread and its length and width was measured with a thread from snout to tail where fins arise and from pectoral fin to pelvic fin respectively. A total of 10 sets of collection of all small fishes which were available in the study area was done. Collected fishes were identified on the basis of fin formula and with the help of standard measures from books on fisheries. Mean, standard deviation and standard error of mean was calculated. A questionnaire was conducted to survey the most preferred varieties of fish by the people. The questionnaire also ascertained their choice or their preference i.e. whether they prefer large fishes or small fishes.

## Results and Discussion:

The fishes were collected and observed. These were identified and their length, width and weight were measured. Their means, standard deviation and standard error of mean were calculated. From our study, we found mainly fishes of families Ailiidae, Bagridae, Centropomidae, Clupidae, Cyprinidae, Mastacembelidae, Siluridae were available in the study area. The fishes which were found in the study area are given below:

Bachwa was most abundant, maybe because of the choice of people followed by Chilwa, Pabda,

Baspata, Bata, Tengra, etc. Since Gaichi, Chanda is not a preferred variety by most people therefore its availability in the market was less. Some fishes also came in big sizes also like Tengra, Bachwa, etc. The dimensions of the fishes were also observed. The size may differ from standard observation because of the time or season of study. The mean length of Pabda and Bachwa was greatest. Though the mean length of Tengra was not so high. This may be because of the time of study; But Bachwa and Tengra are consumed both as small and big size fish. The length, width and weight of the fishes were observed. Research shows that small fishes found during the study were diverse in nature. They mainly belonged to families such as Ailiidae, Bagridae, Centropomidae, Clupidae, Cyprinidae, Mastacembelidae, Siluridae. Their size (length and width) and weight also varied from species to species. The fish composition which were mostly available in the study area were as follows:

Our study on small fishes available was in a time period between July to September in the fish market of Patna area. The small fishes found during the study were mainly of nine types as per our study. *Kulkarni (1953)* stressed the importance of a check list with the vernacular or regional and scientific names of fishes. In the local market, these nine fishes were known as Bachwa, Pabda, Baspata, Tengra, Khaira, Chilwa, Bata, Gaichi and Chanda. On survey, we found that most of the people who like small fishes is because of their high nutritional value. We surveyed five hundred people during our research period and made three groups on the basis of fishes preferred by them;

Group 1 included people who prefer small fishes only, group 2 included people who prefer big fishes only and group 3 included people who like both types of fishes (small and big).

The small fishes were less abundant in the market as compared to big fishes. Also, the catch composition was less as compared to big fishes. The inland fisheries contribute about 25 percent to the world production of fish (*Sugunan et al, 2007*). Inland fisheries contribute significantly to food security and economic security by providing primary sources of animal protein, essential nutrients, and income (*Welcomme et al. 2010*). The lack of attention to the sector is particularly problematic,

given that capture fisheries are currently being fished at capacity, and that further increases in production will have to come from expansion of aquaculture. There is, therefore, an important role for developing country governments to play, both in managing capture fisheries to prevent further stock depletion, and in regulating the development of aquaculture to ensure that it is both environmentally sustainable. Under such conditions, fisheries and aquaculture can realise their potential as an important and growing source of economic development in rural areas. Thus, our study indicates a loss of diversity of small fishes. Also the demand for small fish is less; therefore it requires greater attention and further research.

#### **Conclusion:**

When compared to handbook of Fishery Department, Patna, we observed that the composition and species coming to market is now reduced. This may be due to improper fishing leading to environmental stress, pollution, etc. Although nutritive value and protein content in small fishes were high it was not as much in demand as big fishes. Small fishes were not much in demand also because of the lack of knowledge about their importance in the diet. People who prefer small fishes usually prefer fishes with single bone like baspata, bachwa, tengra, etc. Freshness also affects sale as the quality of small fish deteriorates easily on exposure after catching. Cleaning and processing of small fishes takes time. Festivals, holidays, etc. affect varieties and consumption as well.

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**Table 1. Small fishes found in the study area and their abundance**

S. No.	Name of fish	Scientific Name	Family	Abundance
1.	Bachwa	<i>Clupisoma garua</i>	Alliidae	Mostly abundant
2.	Pabda	<i>Ompak pabda</i>	Siluridae	Moderately abundant
3.	Baspata	<i>Ailia coila</i>	Alliidae	Moderately abundant
4.	Tengra	<i>Mystus vittatus</i>	Bagridae	Abundant
5.	Khaira	<i>Gudusia chapra</i>	Clupidae	Abundant
6.	Chilwa	<i>Oxygaster bacaila</i>	Cyprinidae	Mostly abundant
7.	Bata	<i>Labeo bata</i>	Cyprinidae	Abundant
8.	Gaichi	<i>Mastacembelus pancalus</i>	Mastacembelidae	Less abundant
9.	Chanda	<i>Chanda ranga</i>	Centropomidae	Less abundant

**Table 2. Showing mean length (in cms), standard deviation, standard error of mean**

Fish	Mean Length of Fish	Standard Deviation	Standard Error of Mean
Bachwa	12.25	0.79	0.16
Pabda	12.39	1.43	0.29
Baspata	9.26	0.91	0.19
Tengra	7.8	1.44	0.3
Khaira	7.55	0.78	0.16
Chilwa	6.79	0.88	0.18
Bata	9	2.81	0.58
Gaichi	10.49	2.85	0.59
Chanda	4.68	0.44	0.09

**Table 3. Showing mean width (in cms), standard deviation, standard error of mean**

Fish	Mean Width of Fish	Standard Deviation	Standard Error of Mean
Bachwa	2.31	0.53	0.11
Pabda	2.48	0.47	0.09
Baspata	1.66	0.2	0.04
Tengra	1.61	0.26	0.05
Khaira	2.28	0.23	0.04
Chilwa	1.6	0.2	0.04
Bata	1.87	0.61	0.13
Gaichi	1.05	0.16	0.08
Chanda	1.86	0.16	0.06

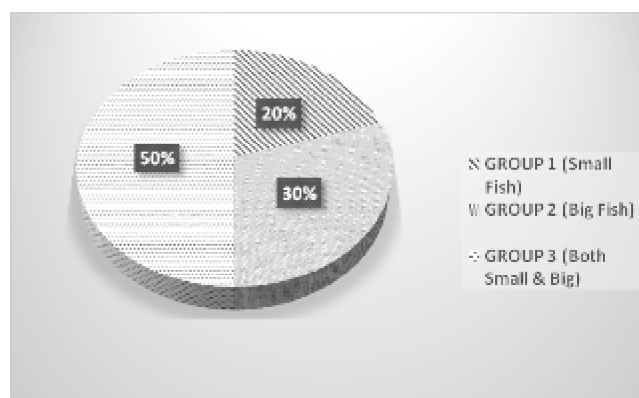
**Table 4. Showing mean weight (in gms), standard deviation, standard error of mean**

Fish	Mean Weight of Fish	Standard Deviation	Standard Error of Mean
Bachwa	25.96	1.13	0.23
Pabda	12.95	4.31	0.89
Baspata	4.96	1.23	0.25
Tengra	6.66	3.36	0.7
Khaira	6.54	1.48	0.31
Chilwa	5.47	1.75	0.36
Bata	27.91	15.67	3.27
Gaichi	11.96	0.52	0.11
Chanda	3.4	0.91	0.19

**Table 5. Showing preferred type of variety by the people**

Groups	No. of people	% of type of fish Preferred
GROUP 1 (Small fish)	97	20%
GROUP 2 (Big fish)	152	30%
GROUP 3 (Both fish)	251	50%
Total	500	100%

**LIST OF FIGURE**



**Fig 1. Showing % of type of fish preferred by the people**

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