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Study on food and feeding habits of snake headed fishes from Guthia Taal, a wetland of district Bahraich, U.P.

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Abstract

Aim of the present piece of work was to analysis the food composition and feeding habits of three snake headed fresh water air breathing fishes. The RLG value of *Channa* species decrease with the increasing length of the fish that revealed the changing feeding habit from fry stage to adult stage. The gut content of three fishes has been analysed and are broadly classified into six categories i.e. zooplankton, annelids, insects, fishes, plant matter and decay organic matter. Gut content analysis showed significant seasonal patterns and dominated by Insects (30.20-35.58 %) followed by decay organic matter (17.65-21.58%), fishes (15.96-17.00%), zooplankton (10.93-13.05%), plant matter (11.44-13.31%) and annelids (5.58-7.26%), in the order of preference.

Keywords: Gut content analysis, Gastro somatic index, relative length of gut

Introduction

The qualitative and quantitative food analysis of fish in their natural habitats helps in understanding the growth, abundance, productivity of water body. Fishes have become adapted to a wide variety of food. Fishes are highly adaptable in their feeding habits and utilize the readily available food (Prakash, 2016) ^[1]. The magnitude of fish population in a region is the function of food potentialities and are varies with the species, seasons, food availability, food preference, maturity stage and spawning season of the fish (Krishna, *et al.* 2016) ^[2]. The relationship between the food component and fish is essential for the production and exploitation of the fish stocks (Sunder, *et al.* 1990) ^[3].

The gut content analysis provides an important insight in to the feeding pattern and qualitative as well as quantitative assessment of feeding habits of fish. Analysis of food and feeding patterns of fish is an important aspect of fisheries management because the food, feeding habits and gut content analysis can be used to evaluate the habitat preferences, prey selection, effects of ontogeny and developing conservation strategies (Chipps and Garvey, 2007) ^[4]. It is not possible to collect sufficient information of food and feeding habit of fish in their natural habitat without studying its gut contents (Hyslop, 1980) ^[5].

Fish performs their various physiological activities such as growth, reproduction, restoration etc. with the help of energy obtained from the food and are highly adopted in their feeding habits with utilizing most of the readily available food components. The qualitative and quantitative food analysis of fish in their natural habitats helps in understanding the growth, abundance, productivity of water body and used to describe food habits, feeding patterns of fishes (Prakash, 2015) ^[6].

Food and feeding habit of fishes has a great significance in fish farming. It helps to select such species of fishes for culture which will utilize all the available potential food of the waterbodies without any competition with each other but will live in association with other fishes. This will allow the best utilization of food sources of waterbody and will give an optimum yield. The feeding intensity of fish changes during the pre-spawning, spawning and post-spawning seasons. The food and feeding habits of fish vary with the time of day and season of the year and depends upon the availability of food components (Prakash, 2015) ^[6]. There is no authentic information on the food and feeding habits of Snake headed fish (*Channa* species) in this study area. So, the present investigation was carried out to fulfill the paucity of information on food and feeding habits of Snake headed fish (*Channa* species) especially from Guthia Taal, a wetland of district, Bahraich, U.P.

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Materials and Methods

The Snake headed fishes, *Channa punctatus*, *Channa striatus* and *Channa gachua* of different sizes were collected from Guthia Taal, Bahraich, U.P., India with the help of fisherman during July, 2017 to June, 2018. The collected fishes were brought to the laboratory for further analysis. The total length, and weight of fishes were measured with the help of Vernier Calliper and electronic weighing balance, respectively. Fishes was categorized into three groups viz. group I (less than 6-7cm) group II (more than 8-10cm) and (more than 10cm). After taking the length and weight the entire guts removed and preserved in 4% formalin for further analysis of the different food items. Total 120 guts were examined for analysis of food and feeding habit of snake headed fishes. Gut contents were analyzed by quantitative and qualitative method. The observation of gut contents were grouped in 6 different categories like zooplankton, annelids, insects, fishes, plant matter and decaying organic matter.

Relative length of the gut (RLG): The RLG value was calculated by using the following standard formula $RLG = \frac{\text{length of the gut}}{\text{total length of the fish}}$

Gastro-somatic index (GSI): The feeding intensity or gastro-somatic index (GSI) was calculated by using the following formula

$$\text{Gastro Somatic Index (GSI)} = \frac{\text{Weight of the gut}}{\text{Total weight of the fish}} \times 100$$

Results and Discussion

Results of RLG value are depicted in Table 1. The RLG value of *Channa punctatus*, *Channa striatus* and *Channa gachua* were varied from 0.64-0.91 with average value 0.77 in group I fishes, 0.55-0.82 with average value 0.69 in group II and 0.48-0.70 with average value 0.58 in group III of *Channa punctatus* fishes; 0.58-0.81 with average value 0.71 in group I fishes, 0.51-0.71 with average value 0.62 while 0.45-0.69 with average value 0.55 in group III of *Channa striatus* fishes; 0.57-0.70 with an average value of 0.67 in group I fishes, 0.52-0.72 with average value of 0.66 in group II and 0.44-0.65 with an average value 0.53 in group III of *Channa gachua* fishes. The RLG value was observed maximum in group I fishes followed by group II and group III fishes. This indicates a gradual decline in RLG values as the snake headed fish grows. The RLG value in *Channa* species were observed to decrease with the increasing length of the fish indicating the change of feeding habit from fry stage to adult stage. Similar observation made by various researchers (Hossain *et al.*, 1990; Bhuiyan and Islam, 1991; Saikia, 2012) [7-9] in different fishes and considered these fish species as carnivorous. The value of RLG is generally low in carnivorous fish, higher in omnivorous fish and highest in herbivorous fish (Das and Moitra, 1963) [10]. The findings of the present study indicate the feeding habit of Snake headed fishes is carnivorous and corroborated with the earlier workers.

Table 1: RLG value of Snake headed fishes in both groups

Group	<i>Channa punctatus</i>		<i>Channa striatus</i>		<i>Channa gachua</i>	
	Range	Average	Range	Average	Range	Average
I	0.64-0.91	0.77	0.58-0.81	0.71	0.57-0.70	0.67
II	0.55-0.82	0.69	0.51-0.71	0.62	0.52-0.72	0.66
III	0.48-0.70	0.58	0.45-0.69	0.55	0.44-0.65	0.53

Table 2: Gastrosomatic index (GSI) of Snake headed fishes in different seasons

Seasons	<i>Channa punctatus</i>		<i>Channa striatus</i>		<i>Channa gachua</i>	
	Range	Average	Range	Average	Range	Average
Monsoon	4.82-6.41	5.16	3.88-5.67	4.89	3.75-4.74	4.51
Winter	2.35-3.87	3.11	2.31-3.89	2.78	2.11-3.78	2.65
Summer	3.88-4.92	4.25	3.68-4.21	3.87	3.41-4.05	3.71

The gastrosomatic index was used to find out the feeding intensity of fish. In the present study (Table 2) average gastrosomatic index values of *Channa punctatus*, *Channa striatus* and *Channa gachua* were range 3.11- 5.16, 2.78-4.89 and 2.65-4.51, respectively. The minimum value was recorded during winter, moderate in summer and maximum in monsoon in all three snake headed fishes. Seasonal fluctuation in the feeding intensity was noticed in different season. The gastrosomatic index was maximum in monsoon and minimum in winter season. It may be due to hibernate of these fishes underneath the aquatic weeds and in mud. Seasonal fluctuation of the feeding intensity and dietary composition in fishes are influenced not only by the maturation of gonads but also due to non-availability of food in the habitat. The result of the present study is in agreement with that of earlier worker (Saikia, 2012) [9].

The percentage composition of food items in the gut of snake headed fishes (Table 3) reveals that the composition of diet of *Channa* species have been group into following broad categories: zooplankton (10.93-13.05%), Insects (30.20-35.58

%), annelids (5.58-7.26%), fishes (15.96-17.00%), plant matter (11.44-13.31%) and decay organic matter (17.65-21.58%). Gut contents were analyzed from the different items of the diets in different seasons (Table 3). In the present study seasonal variation showed in feeding habit might be due to fluctuation in the availability of different food items in different season. Zooplankton was the highest percentage (13.05%) occurrence in winter season and that of lowest in monsoon season (10.93%). The highest percentage of insect (35.58%) was observed in winter season and lowest (30.20%) in summer season. The percentage of annelids varied from highest (7.26%) and lowest (5.58%) in monsoon and winter seasons, respectively. The percentage of plant matter varied from highest (13.31%) and lowest (10.93%) in summer and winter seasons, respectively. The decay organic matter was observed highest in summer (21.58%) and lowest in winter season (17.65%). The result of the present study reveals that all three snake headed fish, *Channa* species are carnivorous in feeding habit and mainly fed on the animal food viz. Zooplanktons, annelids, insects and fishes. The result of the

present study is in agreement with that of earlier worker (Alikunhi, and Rao, 1947; Singh *et al.*, 2013) ^[11, 12]. Author reported sarus crane from the taal studied which is the state bird of Uttar Pradesh (Verma, 2016) ^[13]. Food and feeding frequency of fishes are directly related to the food availability in the water body which is affected by the seasonal variations of food items and other factors (Bhuiyan, 2006; Kariman, 2009) ^[14,15]. From the present study it was concluded that snake headed fishes change their food habit with the changes in seasons and due to the availability of different food items in the water bodies.

Table 3: Composition of food items in snake headed fishes in different seasons.

Food items	<i>Channa punctatus</i>	<i>Channa striatus</i>	<i>Channa gachua</i>	Mean
Monsoon Season				
Zooplankton	11.25	10.98	10.57	10.93
Annelids	7.12	7.25	7.42	7.26
Insects	32.12	31.45	31.84	31.80
Fishes	17.15	16.98	16.87	17.00
Plant matter	12.81	12.85	12.57	12.74
Decay organic matter	19.55	20.49	20.73	20.25
Winter Season				
Zooplankton	13.52	12.89	12.75	13.05
Annelids	6.02	5.58	5.14	5.58
Insects	36.24	35.24	34.98	35.48
Fishes	16.85	16.74	16.71	16.76
Plant matter	10.84	11.98	11.51	11.44
Decay organic matter	16.53	17.57	18.91	17.65
Summer Season				
Zooplankton	13.25	12.18	11.97	12.46
Annelids	6.26	6.45	6.74	6.48
Insects	30.21	30.15	30.23	30.20
Fishes	16.24	15.74	15.89	15.96
Plant matter	13.92	13.18	12.84	13.31
Decay organic matter	20.12	22.30	22.33	21.58

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References

1. Prakash S. Comparative analysis in Gut content of Indian major carps from Baghel Taal, Payagpur, Bahraich, U.P. International Journal of Fisheries and Aquatic Studies. 2016; 4(6):531-533.
2. Krishna PV, Panchakshari V, Prabhavathi K. Feeding Habits and Stomach Contents of Asian seabass Lates calcarifer from Nizampatnam Coast, International Journal of Advanced Research. 2016; 4(4):168-172.
3. Sunder S, Kumar K, Raina HS. Food and Feeding Habit and length-weight relationship of *Cyprinus carpio specularis* L. of Dal Lake, Kashmir. Indian J Fish. 1990; 31(1):90-99.
4. Chipps SR, Garvey JE. Assessment of food habits and feeding patterns, In; 2007.
5. Hyslop EJ. Stomach contents analysis-A review of methods and their application. J. Fish. Biol. 1980; 17:411-429.
6. Prakash S. Seasonal variation in food and feeding habit

of Indian major carp (*Labeo calbasu*) in Baghel Taal, Bahraich, U.P. International Journal of Fisheries and Aquatic Studies. 2015; 3(2):483-486.

7. Hossain MA, Parween S, Taleb A, Rahman MH. Food and Feeding Habit of *Notopterus notopterus* (Pallas). Univ. J Zool., Rajshahi Univ. 1990; 9:1-6.
8. Bhuiyan AS, Islam MN. Observation on the Food and Feeding Habit of *Ompok pabda* (Ham.) from The River Padma. Pak. J Zool. 1991; 23:75-77.
9. Saikia AK. Food and feeding habit of *Channa punctatus* (Bloch) from the Paddy Field of Sivsagar district, Assam. Bulletin of Environment, Pharmacology and Life Sciences. 2012; 1(5):10-15.
10. Das SM, Moitra SK. Studies on the food and feeding habits of some fresh water fishes of India. *Ichthyologica*. 1963; 2:107-115.
11. Alikunhi KH, Rao SN. An investigation into the food and feeding habits of some of the common fresh water fishes of Madras. Proc. 34th Ind. Sci. Cong. 1947, 179.
12. Singh CP, Ram RN, Singh RN. Food and feeding pattern of *Channa punctatus* at two different habitats at Tarai region Uttarakhand. Journal of Environmental Biology. 2013; 34:789-792.
13. Verma AK. The Sarus Crane Pair: Made for Each Other. International Journal on Biological Sciences. 2016; 7(2):87-89.
14. Bhuiyan AS, Afroz S, Zaman T. Food and feeding habit of juvenile and adult snakehead, *Channa punctatus* (Bloch). J Life Earth Sci. 2006; 1:53-54.
15. Kariman A, Shalofand SH, Khalifa N. Stomach content and feeding habits of *Oreochromis niloticus* (L.) from Abu-Zabal Lake, Egypt. World App. Sci. J. 2009; 6:1-5.