Indian J.Sci.Res.1(2) : 83-86, 2010

FOOD AND FEEDING HABITS OF FRESHWATER CATFISH, *Eutropiichthys vacha* (BLEEKER)

ASHRAF ABBAS[1]

K.N.P.G. College, Gyanpur, St. Ravidas Nagar, Bhadohi, U.P., India.
E-mail: ashraf.abbas1514@rediffmail.com

ABSTRACT

The freshwater catfish *Eutropiichthys vacha*, is highly predaceous in nature. Feeding intensity with respect to season, maturity stages and food items of this fish were investigated. There was no major shift from the carni-omnivorous orientation of the fish during its various life stages. Aquatic insects, crustaceans, annelids, small forage fish were the main food of adult fish. While Phytoplanktons (Blue green algue, diatoms and desmids) and crustaceans and macrophytes constitute basic food of juveniles. Feeding intensity was high in early maturation and post spawning stages and was relatively lower in the specimens with ripe gonads. Adult consumed more food in autumn than in winter and raining season. Food intake in younger specimens was greater during mansoon and post mansoon season, well developed dentation, strongly built stomach and short intestine besides other characteristics are related to its dietary habits.

KEY WORDS: *Eutropiichthys vacha*, feeding intensity, maturation

The freshwater catfish *Eutropiichthys vacha* is an economically important inland water teleost fish, which is quite palatable as a table fish. The smaller size has often been placed in aquaria while large size are used as food. Demands for the *E.vacha* almost exceeds the supply, particularly in India and Neighboring countries such as Pakistan, Sri Lanka and Bangladesh. There is no information on biology of *E.vacha* despite its palatability and consumer appeal. A survey of literature showed that no information is available on the biology of this fish. Afsar, M.R. (1990) studied the food and feeding habit of closely related fish *Clupisoma garua* (Ham). Keeping in mind the paucity of information on the biology, the present study focuses the food and feeding habits of the species.

MATERIALS AND METHODS

Monthly samples of the fish were obtained from January to December 2009, with each sample comprising about 20-30fishes. The fish were caught from Yamuna river at Allahabad by using cost and drag nets and brought to the laboratory packed in ice. The time of collection was fixed during the early hours of the morning to minimize the possible effect of digestion of food items.

Total length of each fish was measured to the nearest 0.1 mm. the fish (size range 5-30cm) were sexed and divided into five length group on the basis of their size. Gonadal conditions was examined and the stage of maturation of the sample were determined following the scheme of classification used by Qayyum and Qasim (1964) for *Ophiocephalus punctatus.*

The intensity of feeding was studied by determining the gastrosomatic index (gut weight expressed as percentage of body weight) using the method suggested by Khan et al. (1988). For the analysis of gut contents, methods like the frequency of occurrence, numerical counts and gravimetric method were applied as summarized by Lagler (1956) for quantitative analysis, the prey items were identified and categorized according to their systematic status.

RESULTS AND DISCUSSION

The shape of the body and position of mouth, structure of the buccopharynx, short and strong dentation in the mouth, gill rackers well developed and strongly built stomach, short intestine and dominance of animals and their body parts in the gut contents indicate the corni-omnivorous and predatory habits of *Eutropiichthys vacha*. The percentage of body width with respect to the total body length varied between 14.30-22.36 with a mean of 17.7884. Body width and body length were found to have a significant correlation (0.8999). the structure of alimenty canal and external morphology were greatly influenced by

[1]**Corresponding author**

ecology of the food and feeding regimes.

The organs concerned with feeding and digestion are modified according to its feeding behavior. The mouth is subterminal and slightly over hang by the snout. The gap of the mouth is 19% of the length of the head. Mouth opening is wide and is surrounded by four pairs of barbells that help in seeking out food according to its selectivity. Teeth are present in jaws, mouth and pharynx. Teeth on the jaws are small numerous and villiforms which are backwardly directed, numerous small pointed vomerine teeth are continuous to those of the palatine on the roof of the oral cavity and are in the form of semilunar band. A pair of upper and lower pharyngeal teeth occurs as pads near to the gill arches. The nature of the dentation suggest that the teeth are meant for grasping puncturing and holding the prey. Gill rackers are few widely spaced, elongated blunt at the end point. Small prey organisms are prevented from escaping through the opercular opening by these elongated filamentous rackers, which act as traps. Buccopharyngeal cavity in *E.vacha i*s enlarged which can be occupied by comparatively large prey. Two pairs of oval patches of superior and inferior pharyngeal teeth directed towards gullet, help in pushing of the prey into the stomach. The mouth gap and buccopharyngeal cavity are wide enough to support intake of small to medium sized forage items. The oesophagus is long tubular and broad anteriorly and narrow posteriorly. The stomach is thick walled, sac shaped and has huge dispensability nearly two or three times the normal size. The internal musculature is hard but not wavy. The thick muscular wall allows the stomach to perform its mechanical function of macerating the food in addition to working as a significant site for digestion. Stomach opens into straight and thick walled intestine comprising of duodenum and ileum.

Relative Gut index (RGI)

The values of relative gut indices of different age group of *E. vacha* are given in Fig. 1. The gut length/Total body length ratio is 1:1.8 to 1:2.12 in young individuals while the same ratio varied from 1:0.88 to 1: .03 in adult. High value of RGI in younger size group and low value in adult specimens indicated their herbi-omnivorus and carni-omnivorous nature respectively. So growth involves a slight changes over in dietary habits from juvenile to adult stages. The relationship between gut length and body length can be expressed by the equation:

Log gut length = -0.4255+2.0328 Log body length (cm)

There exist a significant correlation between gut length and total body length ('r' = 0.889, $P<0.01$)

Feeding intensity in relation to season and maturity stages

The gastrosomatic index of both size of different age group of *E. vacha* for different months is observed. The larger individuals in size range 26-30 cm consumed more food during summer (April to June) than during rainy season and winter. The younger specimens including both size range 5-10cm 11-15cm were found to be feeding heavily during post monsoon particularly in the month of October and Autumn period. The GSI varied slightly with seasons that indicate that the fish does not feed at the same rate. High rate of feeding intensity during premansoon month (April to May) may be due to extra energy requirement for building up of gonads.

The values of feeding intensity of male and female of *E.vacha* at different stages of maturity are given in table-1. An increase in feeding intensity was observed during the maturation and ripening stage (stage 11 and 111), comparatively reduced in ripe stage (iv). Maximum number of empty gut was encountered in ripe and spent individuals (stage iv and v) in males, but it was only found during ripe stage in females. In the present study suggested that feeding was never discontinued and even during spawning. There was no cessation of feeding. Khan et al. (1988) and Serajuddin et al. (1988) also reported same type of feeding intensity in relation to the stage of maturity in *Mystus numerous* and *Mastacembelus armatus* respectively. The occurrence of low feeding in other fishes coincide with their peak breeding has been reported by several workers such as Jhingaran, (1961), Desai (1970), Bhatnagar and Karamchandani (1979), Fatima and Khan, 1991 and Serajuddin et al. (1988). The low feeding rate during the month October November and March May be due to some factor other than breeding, it may be due to non availability of food or due to abiotic factors such as temperature and turbidity contrary to this Afsar (1990) reported high feeding

intensity during September to October in the closely related fish *Clupisoma garua.*

The food items investigated in *E. vacha* are given in table 2 Adult *E. vacha* is found to be corni-omnivorous feeding predominantly on crustaceans (Prawn) and aquatic insects. The food categories of lesser importance of the group were molluscs barbels that appeared to have been accidently swallowed. In the case of catfish *E.vacha* the crustaceans and aquatic insects were basic food for the adults while phytoplanktons (Blue green algae, diatoms and desmids) crustaceans and macrophytes constitute basic food for juveniles. Teleostomi, zooplaktons and phytoplanktons could be considered as the secondary food for adults while macrophyts aquatic insects and zooplanktons together could be considered as secondary food for juveniles. Selective feeding behaviour of this fish cannot be ruled out. Therefore *E. vacha* may be reffered as corni-omnivorous fish prefer large size food items.

ACKNOWLEDGMENTS

The author thanks Dr. M. Serajuddin, Reader, Department of Zoology, Lucknow University, Lucknow for his valuable suggestion, excellent guidance, sincere cooperation and constant encouragement throughout the period of this work. And the author also thankful Dr. Irfan Ahmad Khan, Head, Department of Zoology, Dr. A.H. Rizvi Degree College Karari Kaushambi for reviewing the paper.

Figure 1: Relative Gut index of *E. vacha* of different sizes

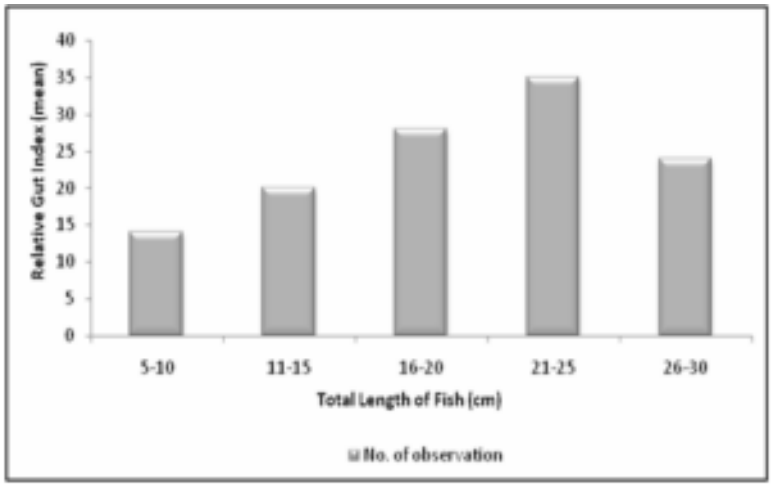

Table 1: Feeding intensity of *E. vacha* in different stages of maturity

Maturity stage	Males			Females		
	Empty guts (%age)	Medium Fullness guts (% age)	Full guts (% age)	Empty guts (% age)	Medium fullness guts (% age)	Full guts (% age)
I	19	41	43	21	41	40
II	18	34	48	15	35	51
III	17	35	51	11	41	51
IV	21	41	40	30	36	36
V	21	41	31	21	40	40

Table 2: Gut contents of Gangatic catfish *E. vacha*

Food items	Numerical counts (%)	Frequency of occurrence	Gravimetric index (%)
Crustacea			
1/ Prawn	80	51.0	82.25
2/ Daphnia	25	22.7	0.98
3/ Nauplius	09	07	0.45
Aquatic insects			
1/ Regimbartia	18.2	19.3	0.5.5
2/ Diptera			
3/ Hemipetra	03	0.58	
Teleostomi			
1/ Puntius spp.	13	21.8	25.9
2/ Channa spp.	01	05.9	07.58
3/ Fish scale	35	33.4	0.90
4/ Unidentified.	26	48.5	60.8
Phytoplankton (Blue green algue, desmid, Diatoms)	Z		
1/ Anabaena		05.8	0.23
2/Netrium		05.6	0.40
3/ Diatoma		06.5	0.42
4/ Unidentified		10.9	02.31
Zooplankton			
1/ Spirostones	15	23	26.87
2/ Vorticella	09	07.8	09.89
Mollusca			
1/ Gastropod	04	02.9	0.19
Debris			
1/ unidentified	26	09.3	0.135
Barbels	29	9.5	0.40
Grains (wheat)	30	11.6	02.81

REFERENCES

Afsar M.R. ;1990. Food and feeding habits of a teleostean fish *Clupisoma garua* (Ham.) in the Ganga river system. J. Freshwater. Biol., **2:** 159-167.

Bhatnagar G.K. and Karamchandani S.J.; 1970. Food and feeding habit of *Labeo fimbriatus* (Bloch) in river Narbada near Hosangabad (M.P.). J. Inland Fish. Soc. India, **2:** 30-50.

Desai V.R. ;1970. Studies on the fishery and biology of *Tor tor* (Ham) from river Narbada. J. Indian fish Soc. India, **2:** 101-112.

Fatima M. and Khan A.A.; 1993. Cyclic changes in the gonads of *Rhingomugil corsula* (Ham) from river Yamuna India. Asian fish Sci., **6:** 23-29.

Jhingran A.G.;1961. Studies on the maturity and fecundity of the Gangatic unchovy, *Setipinna phase* (Ham). Indian J. Fish, **8:**291-311.

Khan M.A. ;1988. Biology of *Labeo calbasu* (Ham-Buch) from Trilaiya reservoiv, Bihar. Length weight relationship, condition index and feeding habits. Proc. Nat. Acad. Sci. India, **58:** 41-47.

Khan M.S., Ambak M.A. and Mohsin A.K.M.;1988. Food and feeding biology of atropical catfish, *Mystus nemurus* with reference to its functional morphology. Indian J. Fish, **35:** 78-84.

Lager K.F. ;1956. Freshwater fishery Biology, lowa. Wm. C. Brown Co. U.S.A.: 421.

Qayyum A. and Qasim S.Z. ;1964. Studies on the biology of some freshwater fishes. Part I *Ophiocephalus punctatus* (Bloch). J. Bombay Nat. Hist. Soc., **6:** 74-89.

Serajuddin M.A., Khan A. and Mustafa S. ;1998. Food and feeding habits of the spiny eel. *Mastacembelus armatus*. Asian fish, Sci., **11:**271-278.