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FOOD AND FEEDING HABITS OF GREY MULLET, *RHINOMUGIL CORSULA* (HAMILTON, 1822) IN THE SITAKUNDA COAST OF BAY OF BENGAL, CHATTOGRAM, BANGLADESH

Syeda Ismat Ara*, M.A. Azadi and Munira Nasiruddin

Department of Zoology, University of Chittagong, Chittagong, Bangladesh

ABSTRACT: A total of 240 Grey Mullet (*Rhinomugil corsula*), collected from the Sitakunda coast of the Bay of Bengal, were used for the analysis of food and feeding habit during the period from January 2017 to December 2017. Thirteen major types of food items, *viz.*, blue-green algae, green algae, diatoms, desmids, dinoflagellates, rotifer, copepod, cladoceran, other crustacean, benthic organisms, semi-decomposed plant parts, decayed organic matters and sand and detritus were found in the gut of the fish. The rank of food preference – according to index of preponderance (IP) – was Diatoms (71.88%) > Green algae (10.01%) > Copepods (9.94%) Blue-green algae (4.42%) > Sand and detritus (2.32%) > Decayed organic matter (2.17%) > Rotifers (1.13%) > Semi-digested plant parts (1.02%) > Desmids (0.71%) >Cladocerans (0.45%) > Crustacea (0.26%) > Benthic organism (0.18%) > Dinoflagellates (0.11%). The highly fed fishes (gorged stomach) were found in May (100%), October (85%), June (65%), August (65%), September (50%), November (50%) and March (43%); whereas the highest empty guts were found in January (45%). Length wise feeding intensity revealed that smaller fishes (9-15 cm) were more active feeder than those of the larger fishes of 15 cm above. It can be inferred that *Rhinomugil corsula* primarily functions as an iliophagus bottom feeder, mainly consuming planktonic organisms, particularly diatoms.

Key words: Grey Mullet, *Rhinomugil corsula,* Sitakunda coast, food habit, feeding intensity.

INTRODUCTION

In the ecosystem-based fisheries analysis, food and feeding habit analysis has become one of the major subject that will decipher the trophic relations in an ecosystem. Food habit studies of fish also helps in understanding some of the higher-level trophic relations in an ecosystem and is an important mechanism for gaining knowledge on feeding ecology and a means to explore interactions between predators and prey (Hall *et al.* 1995, Vander Zanden *et al.* 2000*).* For the proper management and exploitation, knowledge on food and feeding habits of various fishes is very much important. There is need for the quantitative assessment of food habits as

**Author for correspondence: <syedaismat@cu.ac.bd>*
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successful management enables to work on effectively manage aquatic resources (DeVries and Stein 1990). Moreover, the knowledge on the relative importance of different prey items can guide management efforts aimed at increasing fish production. In Bangladesh, fisheries management based on ecosystem approach is in its infancy and needs a detailed study of various trophic components. In culture fisheries, as well as in capture fisheries, knowledge of food and feeding habits of a fish is very much essential. Majority of fishes need different types of food in different stages of their life cycle, fish cultivators should have a clear idea about the diet on which a particular fish switch over after a certain period of time, and can avoid the competition for food in final stages. Several studies on the food and feeding habits of mullets have been made in different parts of the world. Notable ones are –Pillay (1953) on *Mugil tade*, Luther (1963) on *Mugil cephalus* and *M. microlepis*; Blaber and Whitefield (1977) on Juvenile mullets in South-east African estuaries, Khan and Fatima (1994) on *Rhinomugil corsula*, Mondal *et al.* (2015) on *M. cephalus*. In Bangladesh limited works also have been done on mugil species those of Joadder and Hossain (2008) on *Liza parsia*; Islam *et al.* (2009) on *M. cephalus* and Sultana *et al.* (2013) on *R. corsula* are mentionable.

Rhinomugil corsula belong to the order Mugiliformes under the family Mugilidae, is one of the commercially important grey mullets which inhabit both freshwater river as well as coastal brackish water ecosystem, especially in Bangladesh, India, Nepal and Myanmar (Ara *et al.* 2019). The fish might be suitable for culture in intertidal ponds of coastal zone because it is very hardy fish and can tolerate a wide range of salinity and temperature (Ara *et al.* 2021). *This fish has* high demand as food fish in Asian countries. Khan and Fatima (1994) has given an account of the food and feeding habits of the freshwater specimens of *R. corsula* from the Yamuna River of India. Sultana *et al.* (2013) also has given a brief account of the food and feeding habits of *R. corsula* from the south-western coast of Bangladesh, which contain very insufficient information. As no detail works on the food and feeding habits of this fish species was done previously in this part of the world, especially on the coastal specimens, this studies on food and feeding habits of *R. corsula* has been intended in the present work.

MATERIAL AND METHODS

Samples were collected from the fishermen, who directly collect fish from the coastal water of the Bay of Bengal at Sitakunda, which is situated at the north-western part of Chattogram district between 22°34´ N and 22°43´ N latitude and 91°38´ E and 91°41´ E longitude, with the help of various traditionally used fishing gears, especially enclosure net and ESBN. A total of

240 *Rhinomugil corsula* were collected for the study of food and feeding habits during the period between January 2017 and December 2017. The fishes were generally cut open in the field and the whole viscera was fixed in 5% formaldehyde solution before brought to the laboratory. Each fish was measured up to the nearest cm with one decimal point from the tip of the snout to the longest ray of caudal fin, weighed nearest to 0.01g and sexes were identified. The alimentary tract was measured on fish measuring board and weight of alimentary tract was taken on sensitive electrical balance (AND GULF model: EK6001, Korea). The gut content was thoroughly washed in a petri dish containing adequate quantities of water for dilution. It was then thoroughly mixed. A sample of 0.1 ml was taken in a Sedgewick-Rafter cell with the help of a graduated dropper and examined under a binocular microscope (model: XSZ-107BN, China). In the present study, percentage of decayed organic matter, mud and detritus were determined by eye estimation following Pillay (1952). In this method the content of each sample is considered as unit, the various items being expressed in terms of percentage by volume as estimated by inspection. Food organisms were analyzed quantitatively and qualitatively. In qualitative analysis, food items were identified up to generic level following Devis (1955), Ward and Whipple (1959), Needham and Needham (1962), and Chowdhury and Khair (1982). Quantitative analysis was done by occurrence method and point volumetric method as described by Hynes (1950) and Pillay (1952).As only one method may give a misleading result so by considering both, occurrence and point volumetric method in association, a more accurate picture of dietary importance was gained (Hyslop 1980). The feeding intensity was measured by recording the condition of food in the guts which was classified as full, ¾ full, ½ full, ¼ full and empty according to the degree of distension of stomach. The relative importance of various food item was calculated using the index of preponderance (IP) (Natarajan and Jhingran 1961).

RESULTS AND DISCUSSION

Food composition and its variations: In the gut contents of *R. corsula* , 13 types of food items, viz., blue-green algae, green algae, diatoms, desmids, dinoflagelletes, rotifer, copepod, cladocera, other crustacean, benthic organisms, semi-decomposed plant parts, decayed organic matters and detritus, were found. These food items were invariably found along with sand and mud of the bottom zone of the coast, which indicated that these foods were consumed from that zone of the coast.

Monthly variations of food items in the stomachs of R. corsula: Percentage of different food items found in different month in the gut of *R. corsula* were as follows*:*

Blue green algae: The percentage composition of Blue-green algae constituted about 8.66% in occurrence method while 8.15% in point volumetric method. Five genera of Myxophyceae viz., *Nostoc, Anabaena, Oscillatoria, Spirulina* and *Chroococcus* were found. According to occurrence method, highest amounts of blue green algae was consumed in May (17.69%) and lowest amount was consumed in October (1.4%). In the point volumetric method, the fish consumed highest amount of this food item in July (15.47%) and lowest amount in November (1.16%) (Table 1).

Green algae: Green algae constituted the 11.64% and 10.73% of the total food contents in occurrence and point volumetric methods, respectively. Seven genera of Chlorophyceae were observed, viz., *Spyrogyra, Microspora Zygnema, Oocystis, Ulotrix, Eudorina* and *Schroederia*. According to occurrence method, highest amounts of green algae found in August (23.11%) and lowest amount was consumed in December (4.06%). On the other hand, in the point volumetric method, the fish consumed highest amount of this food item in August (26.87%) and lowest amount in December (2.43%) (Table 1).

Diatoms: Diatoms constituted the maximum proportion of the total food contents of *R. corsula.* The percentage of this food item was 30.28% in occurrence method and 40.94% in point volumetric method. Fifteen genera of diatoms were found viz., *Nitzchia, Diatoma, Coscinodiscus, Thalassiosira, Triceratium, Melosira, Biddulphia, Tabellaria, Synedra, Navicula, Fragillaria, Amphora, Rhizosolenia, Pleurosigma* and *Asterionella*. They occurred fairly in large amount throughout the period of investigation. Higher amount of diatoms was consumed in October (45.8%) and (62.47%) in November in occurrence and point volumetric method, respectively. On the other hand, lower consumption of diatoms occurred in July (20.98%) in occurrence method and January (27.57%) in point volumetric method (Table 1).

Desmids: Desmids constituted the 4.26% and 2.65% of the total food contents in occurrence and point volumetric methods, respectively. Four genera were found viz., *Closterium, Cosmerium, Desmidium,* and *Docidium*. According to occurrence method, maximum amounts of desmids consumed in February (7.83%), and minimum amount was consumed in October (0%), November (0%) and December (0%)). On the other hand, in point volumetric method, the fish consumed highest amount of this food item in June (5.05%) and lowest amount in October (0%), November (0%) and December (0%) (Table 1).

Dinoflagellates: Three genera of Dinoflagellates occurred in the food contents of *R. corsula* viz., *Ceratium, Dinophysis* and *Peridinium*. Dinoflagellates constituted 1.88% and 0.93% of the total food contents in occurrence and point volumetric methods, respectively. According to occurrence method, maximum amount of Dinoflagellates was consumed in June (4.74%) and minimum amount in

Table 1. Percentage of volume of various groups of food items in different months from the guts of *Rhinomugil corsula* by occurrence and point volumetric method

	Group	Jan %	Feb %	Mar %	Apr %	May %	June %	July %	Aug %	Sep %	Oct %	Nov %	Dec %	Average %
Percentage following occurrence method.	Blue-green algae	4.62	3.29	10.15	8.97	17.69	16.71	16.54	14.01	6.38	1.4	1.58	2.54	8.66
	Green algae	11.34	6.32	5.95	14.62	15.03	20.61	18.55	23.11	9.17	6.07	4.74	4.06	11.64
	Diatoms	24.36	28.56	25.99	28.91	31.83	21.18	20.98	24.25	31.5	45.8	44.74	35.53	30.28
	Desmids	6.30	7.83	4.46	5.31	4.42	6.68	7.26	5.31	3.59	0	0	0	4.26
	Dinoflagellates	0	0	3.22	4.32	0.88	4.74	3.23	0	0	0	3.69	2.54	1.88
	Rotifera	7.98	8.84	9.41	4.32	5.59	5.57	4.44	3.04	7.97	5.61	7.37	10.66	6.73
	Copepoda	20.16	18.44	19.81	18.61	9.73	8.63	5.25	6.82	12.75	13.54	7.89	19.29	13.41
	Cladocera	3.36	3.79	3.71	3.32	0.88	1.39	2.42	1.89	3.19	2.34	1.58	4.06	2.66
	Crustacea	7.14	7.58	2.98	0	1.47	0.84	0	0	0	0	2.63	7.11	2.47
	Benthic organisms	2.52	2.53	1.98	3.32	1.77	1.67	2.02	1.52	3.19	1.87	4.21	2.03	2.38
	Semi-decomposed Plant parts	2.94	4.29	2.48	1.66	2.36	3.34	6.45	5.68	7.17	7.01	5.26	3.05	4.31
	Decayed organic matter	4.62	4.29	4.95	1.66	2.65	4.18	6.45	7.20	7.57	8.41	7.89	5.08	5.41
	Sand & detritus	4.62	4.29	4.95	4.98	5.60	4.46	6.45	7.20	7.57	7.94	8.42	4.06	5.88
Percentage following volumetric method.	Blue-green algae	4.18	7.85	9.62	10.43	12.22	12.92	15.47	10.47	7.81	2.95	1.16	2.68	8.15
	Green algae	7.92	8.25	4.66	9.97	13.51	19.94	16.23	26.87	11.7	4.13	3.24	2.33	10.73
	Diatoms	27.57	37.11	35.48	37.64	40.79	31.1	33.75	34.32	37.14	55.77	62.47	58.09	40.94
	Desmids	3.98	4.078	2.50	2.94	1.91	5.05	4.58	3.94	2.94	0	0	0	2.65
	Dinoflagellates	0	0	1.49	2.01	0.74	1.65	2.21	0	0	0	2.08	1.05	0.93
	Rotifera	5.14	4.58	4.25	2.47	2.26	1.42	1.60	1.09	2.47	1.66	2.14	3.15	2.68
	Copepoda	22.23	16.28	22.07	16.9	9.46	7.89	4.19	5.42	3.39	3.98	5.96	13.14	11.85
	Cladocera	5.07	4.11	5.87	2.51	1.87	1.42	2.07	1.26	2.52	1.86	1.39	2.80	2.73
	Crustacea	6.25	5.14	2.06	0	1.40	0.78	0	0	0	0	0.58	3.68	1.65
	Benthic organisms	1.48	1.401	1.21	2.01	1.05	0.91	0.91	0.75	0.79	0.93	1.39	1.4	1.19
	Semi-decomposed Plant parts	3.52	2.491	3.37	3.02	4.67	3.37	5.18	3.35	5.25	5.17	3.47	2.33	3.77
	Decayed organic matter	7.74	6.23	4.72	6.71	4.67	6.07	5.18	4.19	9.45	9.31	6.94	5.83	6.42
	Sand & detritus	4.92	2.491	2.70	4.19	5.45	7.42	8.64	8.38	10.5	8.27	9.25	3.5	6.31

January (0%), February (0%), August (0%), September (0%) and October (0%). On the other hand, in point volumetric method, the fish consumed highest amount of this food item in June (2.21%) and and lowest amount in January (0%), February (0%), August (0%), September (0%) and October (0%) (Table 1).

Rotifers: Rotifers constituted 6.73% and 2.68% of the total food contents in occurrence and point volumetric methods, respectively. Three genera of rotifer were found in the food contents of *R. corsula* viz., *Trichocera, Brachionus* and *Keratella*. According to occurrence method, highest amount of Rotifers was consumed in December (10.66%) and lowest amounts were consumed in August (3.05%). The fishes consumed highest amount of this food item in January (5.14%), and lowest amount in August (1.09%) according to point volumetric method (Table 1).

Copepods: Six genera of copepods were found in the food contents of *R. corsula* viz., *Oncaea, Calanus, Microsetella, Oithona, Calanopia* and *Coryeacus*; The total share of this food item was 13.41% and 11.85% in occurrence and point volumetric methods, respectively. According to occurrence method, highest amount of Copepods was consumed in January (20.16%) and lowest amounts was consumed in July (5.25%). On the other hand, in point volumetric method, the fish consumed high amount of this food item in January (22.23%), and lowest amount in July (4.19 (Table 1).

Cladocerans: Evadudae was the only cladoceran genera found in the food contents of *R. corsula*, which accounts for 2.66% and 2.73% of the total food contents in occurrence and point volumetric methods, respectively. According to occurrence method, highest amount of cladocerans was consumed in December (4.06%), and lowest amount was in May (0.88%). In the point volumetric method, the fish consumed highest amount of this food item in March (5.87%) while lowest amount in August (1.26%) (Table 1).

Other crustaceans: Crustaceans other than copepod and cladocera constituted the 2.47% and 1.65% of the total food contents in occurrence and point volumetric methods, respectively. Three types of crustaceans were found in the food contents of the present study. These were *Lucifer*, Nauplius larvae of shrimps and *Acetes* and carb zoea. According to occurrence method, highest amount of other crustaceans were consumed in February (7.55%) and lowest amounts consumed in April (0%) and July to October (0%). On the other hand, in point volumetric method, the fish consumed highest amount of this food item in January (6.25%) and lowest amount in April (0%) and July to October (0%) (Table 1).

Benthic organisms: Benthic organisms constituted the 2.38% and 1.19% of the total food contents in occurrence and point volumetric methods, respectively.

Important organisms were polychaetes, olygochaetes, nymphs, nematodes, mollusks, etc. According to occurrence method, highest amounts of this item were consumed in November (4.21%) and lowest amount in August (1.52%). On the other hand, in point volumetric method, highest amount occurred in April (2.07%) and lowest amount in June (0.91%), and July (0.91%). (Table 1).

Semi-decomposed plant parts: Semi-decomposed plant parts constituted the 4.31% and 3.77% of the total food contents in occurrence and point volumetric methods, respectively. According to occurrence method, highest amounts of this food item was consumed in September (7.17%) and lowest amount consumed in April (1.66%). In the point volumetric method, the fish consumed highest amount of this food item in September (5.25%) and lowest amount in December (2.33%). (Table 1).

Decayed organic matter: Decayed organic matter constituted the 5.41% and 6.42% of the total food contents in occurrence and point volumetric methods, respectively. According to occurrence method, maximum amount of this item occurred in October (8.41%) and minimum amount in June (1.18%). On the other hand, in point volumetric method, the fish consumed highest amount of this food item in September (9.45%) and lowest amount in May (4.67%) (Table 1).

Sand and detritus: Sand and detritus constituted the 5.88% and 6.31% of the total food contents in occurrence and point volumetric methods, respectively. According to occurrence method, highest amount of sand and detritus were found in November (8.42%) and lowest amounts in February (4.22%). In the point volumetric method, highest amount of this food item found in September (10.5%) and lowest amount in February (2.49%) (Table 1). Fatima (1991) found 47 genera of aquatic organisms along with dead organic matters, detritus and sand and debris in the gut contents *R. corsula* from Yamuna River in India, which were divided into 14 categories. Sultana *et al.* (2013) mentioned 25 different taxa of aquatic organisms in the food of *R. corsula* from coastal region of Khulna district of Bangladesh. All the mullets are bottom feeder which has been illustrated by Pillay (1953) and Sarojini (1957). Gunther (1861 and 1880) first observed that the fish of this genus, *Rhinomugil*, fed on organic substance with sand and mud. Hornell (1911) also observed the same; however, he added that the fish, on occasion, feed immensely on shoals of small crustaceans. Jaccot (1920) explained that stomach content of adult fish consisted of roughly 40% sad and mineral matter and remaining 60% vegetables and animal matters. The predominant presence of diatoms, green algae, blue-green algae, copepods and other crustaceans, sand and detritus, decayed organic matter and benthic organisms in the gut strongly suggested the possibility of *R. corsula* being omnivorous. The presence of mud and detritus mixed along with these food matters in a considerable amount, and decayed organic matter give the evidence

that the fish mainly feed from the bottom zone but collect some food from other zones as well. Hora (1939) described that *M. corsula* is little different from that of other members of the mullet group. This species feed on floating algae, insects and young mollusks entangled among the algal filaments. In the present study diatoms were the most dominant food items which agreed with the observations of Khan and Fatima (1994), presents evidence showed that of the fish was a bottom feeder, as Sarojini (1957) mentioned high amounts of diatoms on the mud flat. Diatoms are generally found in the bottom of coastal water along with the sand grains and decayed organic matters, indicating that they were consumed from the bottom surface.

Food preference by R. corsula (Index of preponderance): Food preference of *R. corsula* was evaluated by Index of preponderance (IP) of different food types. Different food items were ranked according to their preference index value. Diatoms were the most preferred food of *R. corsula* having 71.88% IP index. The rank of the food items according to IP were: Diatoms (71.88%) > Green algae (10.01%) > Copepods (9.94%) Blue-green algae (4.42%) > Sand and detritus (2.32%) > Decayed organic matter (2.17%) > Rotifers (1.13%) > Semi-decomposed plant parts (1.02%) > Desmids (0.71%) > Cladocerans (0.45%) > Crustaceans (0.26%) > Benthic organism (0.18%) > Dinoflagellates (0.11%) (Table 2).

Table 2. Index of preponderance (IP) of food items in the gut contents of *Rhinomugil corsula*

Food items	Occurrence method (%)	Point volumetric method (%)	IP (%)	Rank
Diatoms	30.3	37.91	71.88	1
Green algae	11.63	13.76	10.01	2
Copepoda	13.41	11.85	9.94	3
Blue-green algae	8.66	8.15	4.42	4
Sand &detritus	5.88	6.31	2.32	5
Decayed organic matter	5.41	6.42	2.17	6
Rotifera	6.73	2.68	1.13	7
Plant	4.31	3.77	1.02	8
Desmids	4.26	2.66	0.71	9
Cladocera	2.66	2.73	0.45	10
Crustacea	2.48	1.66	0.26	11
Benthic organism	2.38	1.19	0.18	12
Dinoflagellates	1.88	0.94	0.11	13
Total percentage	100	100	100	

Luther (1963) mentioned high IP index for sand and spicules for marine *Mugil cephalus*, but in the present study highest IP index was found for diatoms. The present observation disagree with the observation of Khan and Fatima (1994) and Suganan and Vinci (1981) both of the study found high IP index for sand and mud particles. They found diatoms as the second largest component of the food,

whereas in the present study diatoms were the most preferred food, which agree with observation of Lavanya *et al.* (2018) for *M. cephalus.*

Sex-wise feeding intensity: A total of 240 stomachs were observed to determine the feeding intensity of *R. corsula,* of them 169 were female and 71 were male. The stomachs were divided into six distinct categories – gorged, full, three-fourth full, half-full, one-fourth full and empty. The percentage of gorged, full, three-fourth full, half-full, one-fourth full and empty stomachs were 3%, 32%, 4%, 27%, 16% and 18%, respectively for males (Fig. 1, a); on the other hand, these percentages were 20%, 35%, 1%, 22%, 11% and 11%, respectively for females (Fig. 1,b). A noticeable difference was observed in the feeding intensity of males and females. 44.38% of the males had 'half or less than half full stomach', whereas 39.44% of the females possessed this type of stomach. On the other hand, 56.62% males had stomachs which were 'more than half full' and the percentage of females with these types of stomach were60.56%. (Figs. 1, a & 1, b). Fatima (1991) stated that the rate of feeding intensity was found higher in females throughout the year than that of the males which agrees with the present observation.

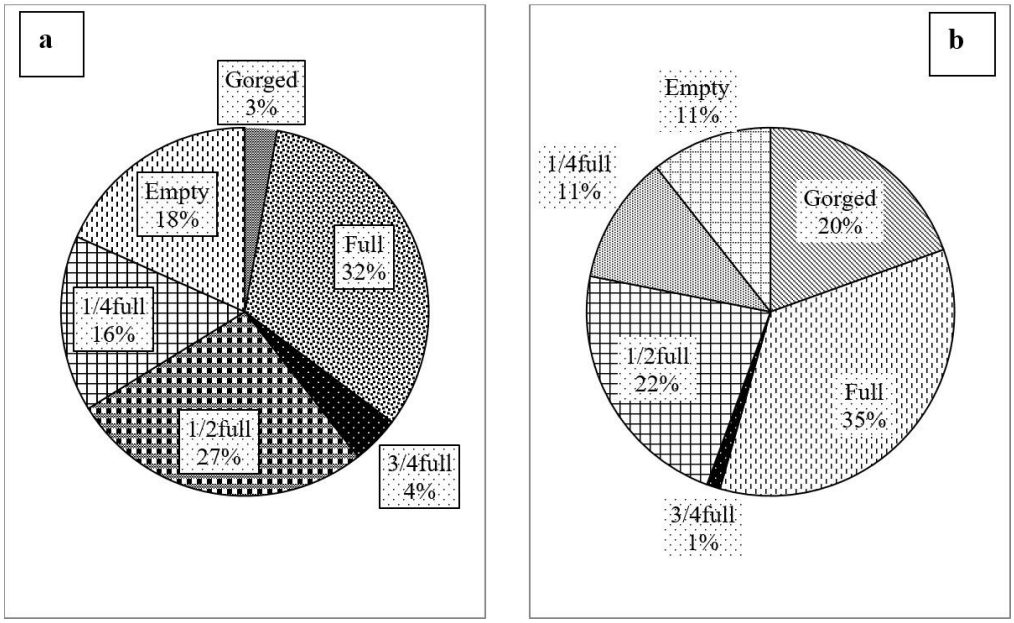

Fig. 1. Feeding intensity of (a) male and (b) female of *Rhinomugil corsula*.

Month-wise feeding intensity: Month-wise variations feeding intensity was analyzed by classifying the fish guts into four major categories, where gorged and full, ¾ full and ½ full, ¼ full and empty guts were considered as highly feed, moderately feed, poorly feed and empty, respectively. It was found that the high percentage of fishes with highly fed stomachs were found in March (45%), May

(100%), June (65%), August (65%), September (50%), October (85%) and November (50%). High percentage of moderately fed guts were found in February (35%), June (45%), and December (35%) (Fig. 2). In no months poorly fed fishes were found in high percentage but only in December 30% of the guts were found poorly fed which was second highest for that month. Only in January highest percentage (45%) of guts were found empty, in no other months empty guts were found in highest percentage (Fig. 2). With the change of months and season the rate of feeding intensity kept changing. A noticeable reduction in the feeding intensity was observed from November to February – which agrees with the observation of Lavanya *et al.* (2018) and they found more fishes with empty guts from November to March for *Mugil cephalus* – when lots of spent fishes were found. This observation disagrees with the observation of Fatima (1991) for the same species of fish, whereby she found spent fishes as intense feeder, i.e., more empty guts were found, during May to August, which was the breeding season of this fish. In the present study, 12.92% of the total guts examined were found empty (Table 3), Lavanya *et al.* (2018) found 9.63% empty guts in *Mugil cephalus* from India.

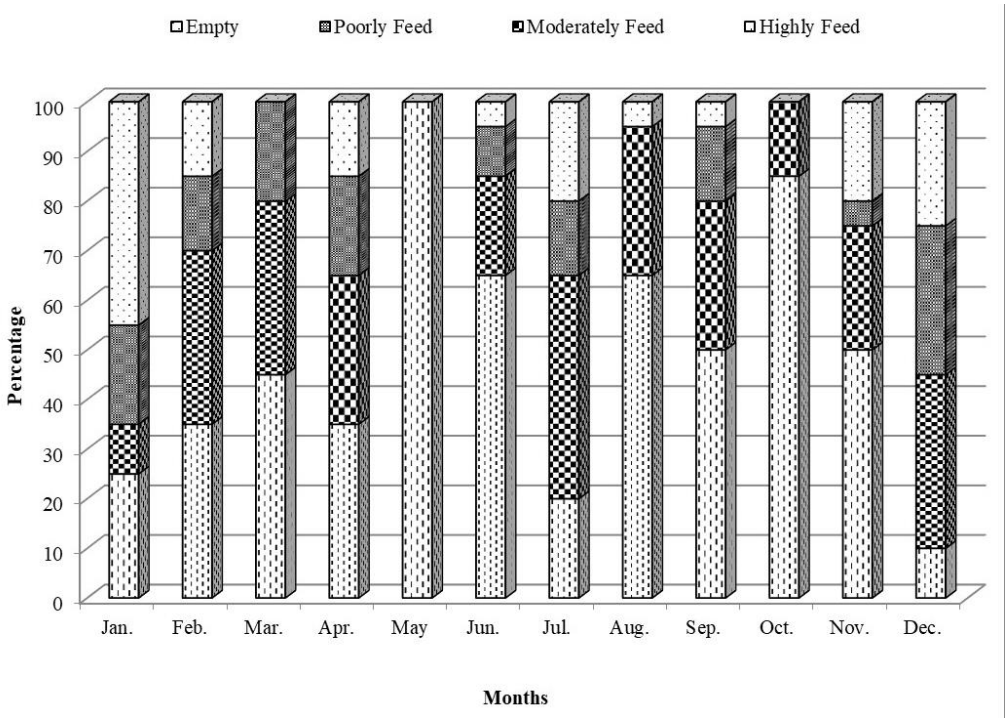

Fig. 2. Monthly variation of feeding intensity of *Rhinomugil corsula.*

Feeding intensity in different length class: The fishes were classified into ten length classes and their guts were classified into six types - gorged, full, three-

fourth full, half full, one-fourth full and empty guts, which can be include into two broad categories – 'more than half full' and 'half or less than half full'. Feeding intensity of different length classes are shown in the Table 3. In the 9-11 length class, 78.13% had more than half full guts and 21.87% had half or less than half full guts. Thirty five (14.58%) of the fish belonged to 11-13 cm length class. 68.57% of the 11-13 cm length class had more than half full guts and 31.43% had half or less than half full guts. In the 13-15 length class, 70.37% of them had more than half full guts and 29.63% had half or less than half full guts. 11.25% of the fish belong to 15-17 cm length class, 37.04% of them had more than half full guts and 62.96% had half or less than half full guts. 16.67%of the fish belonged to 17-19 cm length class and 22.5% of them had more than half full guts and 77.5% had half or less than half full guts. 16.67% of the fish belonged to 19-21 cm length class, 35% of them had more than half full guts and 65% had half or less than half full guts. 10.42% of the fish observed in the 21-23 cm length class and 48% of them had more than half full guts and 52% had half or less than half full guts. In the length class 23-25 cm, 66.67% of fish possessed more than half full guts and 33.33% had half or less than half full guts. 2.09% of the fish belong to 25-27 cm length class. Of them, 40 possessed gorged guts, whereas, 60% possessed one fourth full gut, accordingly, 40% guts were more than half full and 60 guts were half or less than half full. 1.25% of the fish belonged to 27-29 cm length class, all of them had gorged guts. It was evident from the observation of guts that the smaller fishes (9-15 cm) were more intense feeder than those of larger fishes (15 cm above).From the analysis it was found that fishes below 15 cm length possessed high numbers of 'more than half full' guts than those fishes above15 cm length.

Table 3. Percentage of fullness of stomach of *R. corsula* among different length-class

Length	Gorged		Full		3/4Full		1/2Full		1/4Full		Empty		Total		> ½	=/< ½
class (cm)	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	full	full
9-11	3	9.38	20	62.5	2	6.25	5	15.63	2	6.25	0	0	32	13.33	78.13	21.88
11-13	2	5.71	21	60	1	2.86	8	22.86	1	2.86	2	5.71	35	14.58	68.57	31.43
13-15	6	22.2	13	48.15	0	0	6	22.22	2	7.41	0	0	27	11.25	70.37	29.63
15-17	1	3.7	9	33.33	0	0	9	33.33	5	18.5	3	11.1	27	11.25	37.04	62.96
17-19	2	5	6	15	1	2.5	13	32.5	5	12.5	13	32.5	40	16.67	22.5	77.5
19-21	6	15	7	17.5	1	2.5	9	22.5	8	20	9	22.5	40	16.67	35	65
21-23	7	28	5	20	0	0	5	20	4	16	4	16	25	10.42	48	52
23-25	3	50	1	16.67	0	0	2	33.33	0	0	0	0	6	2.5	66.67	33.33
25-27	2	40	0	0	0	0	0	0	3	60	0	0	5	2.083	40	60
27-29	3	100	0	0	0	0	0	0	0	0	0	0	3	1.25	100	0

Fatima (1991) found high feeding activities in immature and/or maturing stage (first maturity stage) and spent fishes. In the present study fishes below 15 cm length, which were mainly immature and maturing fishes, were intense feeder; this observation agrees with the observation of Fatima (1991) but disagree in the point that spent fishes were also intense feeder, as in the present study fishes which were collected during post breeding season, November to February,

possessed considerable number of empty guts. Fatema *et al.* (2013) found highest intensity of feeding in 18.5-20.5 cm and 18-20 cm length class for *Valamugil buchanani* and *Chelon subviridis*, respectively, from Malaysian coast of the Indian Ocean. In the present study, highest feeding intensity was found in 13-15 cm length class. In 27-29 cm length class 100% of the fishes were found with gorged guts but that was not taken into consideration as the number of fishes was only three, hence considered as exceptional incidence.

In conclusion, the occurrence of large amount of benthic diatoms and green-algae along with mud, sand and detritus, which are considered to be materials of iliotrophic layer. Thus the feeding ecology of the fish is iliophagus in nature. The fish can also be considered as an omnivorous as its diet list consisted of a large number of food items – from microorganisms to parts of higher aquatic plants. Aerial vision and the position of the mouth just near the water surface may aid in gulping the floating materials which suggest that it may take some planktonic surface food also.

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