

**Food and feeding habits of the Indian  
catfish (*Heteropneustes fossilis* (Bloch))  
from Tigris river at Al- Kadhimia region,  
north of Baghdad city**

**H. A. M. Dauod**

**Department of Biology, College of Education Ibn -AL Haitham**

**Abstract**

Food and feeding habits of *Heteropneustes fossilis* (Bloch) have been investigated. Monthly samples (twice a month) were taken during the period from March 2000 to February 2001, using small – meshed cast net. A total of 197 fish were used to examine the stomach contents.

The analysis of stomach contents of *H. fossilis* in the area of study revealed that fish were fed on the bottom, mid surface and surface food. The main food of the fish were phytoplanktons, molluscs, chironomid larvae and pupae and higher plants which mean that the species under investigation prefer to be carnivorous in the area of study. the study of variation in feeding intensity of *H. fossilis* , showed that the highest feeding intensity was observed during summer months while the lowest was during autumn and such variation occurred due to the availability of food in the habitat, the changes in temperatures and /or perhaps due to the feeding habits of this species.

**Introduction**

The Indian catfish *Heteropneustes fossilis* (Bloch) is one of the common tropical fish. It occurs in India, Sri Lanka, Burma, China, Bangladesh and Pakistan (1;2;3&4). According to Khalaf (5) this fish introduced to Iraq and appeared in high density during August 1960 in Tigris and Euphrates rivers. Al Daham (6) stated that fish under investigation is widely distributed in the south and middle Iraqi inland waters. It is also occurred in Shatt Al-Arab, and widely distributed in all south Iraqi inland waters (4;7&8) . From the available literature it is apparent that several works

have been published on various biological aspects of the species under investigation in Iraqi inland water bodies (3;4;7;9;....inter alia ).

The present study on *H. fossilis* has been devoted to investigate the food and feeding habits of this species and to give an idea about the effect of this species on the local fish population as there has been some debate in the literature about whether there is significant competition for food between *H. fossilis* and other fish ( 1& 4) .

It is hoped that the information obtained would be of interest to ichthyologists and biologists, in general and to fish traders and pisciculturists in particular.

### Material and Methods

Fish were sampled using a small meshed cast net , two samples monthly were taken from two stations at Tigris river in Al –Kadhmia region , north of Baghdad city , during the period from March 2000 to February 2001 ( Figure 1) .

The stomachs contents of *H. fossilis* were assessed using both their frequency of occurrence and numerical percentage composition. Food items were classified into eight categories as follows: phytoplankton, higher plants, molluscs, chironomid larvae and pupae, chance food, fish eggs, organic detritus and mud and sand.

### Results

Out of total number of stomach examined (197), 8.12 % (16fish) found empty, whereas 91.88 % (181fish) contained food. The latter was further classified into three groups on the basis of the state of fullness according to the Dauod (10). The percentage of each was as follows:

Full - 37.93%

½ full - 48.75%

¼ full 13.37%

Eight food categories were appeared in the diet of *H. fossilis* from Tigris River at the sites of study. The food categories recorded in the diets of the fish were as follows:

1. Phytoplankton's were represented by *Navicula sp.*, *Diatoma sp.* & *Spyrogyra sp.*

2. Higher plants included parts of different aquatic plants available in the river such as *Ceratophyllum demersum L.* and *Vallisneria spiralis L.*

3. *Dreissensia sp.* was the most abundant molluscs found in the stomach of *H. fossilis* in the area of study.
4. The category chironomids represented mainly by *Chironomus sp.* and *Cryptochironomus sp.* Larvae and pupae
5. The category chance food represented by insect's parts, snail eggs, scales of fish, plants seeds, etc.
6. Eggs of fish included different fish eggs. It is important to note that this category recorded in few number of fish.
7. Organic detritus.
8. Mud and sand occurred in high number of fish stomachs

The percentage frequency of occurrence and the number of various food items in the stomach of *H. fossilis* in different months of the year have been plotted in figure (2 and 3).

It can be seen from the data that phytoplankton, molluscs, chironomid larvae and pupae occupied important position among the stomach contents. The various items of food recognized during the entire year and their percentages frequency of occurrence in the total samples were as follow:

* Phytoplankton	41.556%
* Higher plants	15.897%
* Molluscs	31.282%
* Chironomids (larvae & pupae)	22.051 %
*chance food	10.256%
* Organic detritus	5.641%
* fish eggs	2.564%
* Mud and sand	18.974%

The composition of the diet varied markedly between sampling dates (figure 2 and 3), Phytoplankton's and molluscs were the most abundant food items throughout the period of investigation.

The highest percentage of phytoplankton and molluscs appeared during the period May –August 2000. Chironomid larvae and pupae was another important food item during the months of spring and winter.

The feeding intensity of *H. fossilis* in various months has been illustrated in figure (4) in term of the total weight of food as percentage of body weight. The percentage of empty stomach throughout the period of study has also been plotted in the same figure. It can be seen from the figure that the food consumed was high during summer months and declined during autumn months.

## Discussion

The most frequently occurring food items in the stomach of *H. fossilis* at the site of the present study were phytoplankton and molluscs. The first category however occurred more frequently in the stomach.

The presence of mud and sand in the stomach implied that they are also taken up by fish along with the main item of its food specially phytoplankton which appeared in all months (10, 11&12).

The dominance of the above categories together with the occurrence of mud and sand indicates that though the fish is mainly bottom feeder, yet it undertakes excursion to the mid-surface region of habitat in an attempt to explore other zones of the environment either for feeding or for promoting other function of the life history (10,11,14,&15).

The absence of some aquatic invertebrates such as zooplanktons and insects larvae other than chironomids in the stomach of *H. fossilis* can not be related to their scarcity or absence from the environment because they are available, but it may be owing to the fact that these were not preferred by fish (11&16). In the literature available there has been signs that species under investigation is eggs cannibalism (4). The result of the present study conformed weakly the above foundation as there were only seven fish contained eggs of fish in their stomachs. The high and low occurrence of particular type of food items in the stomach contents during the various months is related to the productivity of the food in the habitat, size of the food organism and the size and habit of the fish ( 11;12;13;17;18&19) . It was observed that the chironomid larvae disappeared from the diet of *H. fossilis* during the period of August –September 2000. This might be due to their seasonal succession or perhaps due to the behavior of fish during this time of the year (11).

## References

1. Bhatt, V.S. (1971). Indian J. Fish. 15:99-115.
2. Al-Malaika, I. (1975) .Mean Oxygen consumption in Indian cat-fish *Heteropneustes fossilis* (Bloch) at different condition .M.Sc. Thesis. College of science, University of Baghdad (in Arabic)
3. Al-Musawi, H.M.K (1990). Spawning periodicity and fecundity of female Indian cat-fish, *Heteropneustes fossilis* (Bloch 1797) from Tigris river, north of Maisan district .M.Sc. Thesis, Basra

- University (in Arabic).
4. Al-Juboury, M.M.K. (1994). Studies on some aspects of the biology of *Heteropneustes fossilis* (Bloch) from lower reaches of Diyala river, M.Sc. Thesis. University of Baghdad. (in Arabic)
  5. Khalaf, K.T (1961). The marine and freshwater fishes in Iraq Baghdad, Al-Rabitta Press: 56 pp.
  6. Al-Daham .N.K.(1977). Fish of Iraq and Arabian Gulf N. Vol.1: Irshad Press, Baghdad, 546pp.
  7. Sirajul-Islam ; Al-Nasiri, A.K.M, S.K and Al-Kadhm, V.N.K (1982) .J.Biol.Sci 13(2):15 pp.
  8. Al-Hassan , L.A. and Muhsin , K.A. (1986) . Zoology on Middel East , 1:116-118 .
  9. Al-Juboury , M.M.K. and Dauod , H.A.M .(1998) . J.Tikret sci 4(3) : 62-81 .
  10. Dauod , H.A.M (1976) .Studies on some aspects of the biology of *Varicorhinus trutta* (Heckel) M.Sc . Thesis .Mousl University .
  11. Dauod , H.A.M (1986) , Studies on some aspects of the biology of brown trout *Salmo trutta* L., minnow *Phoxinus phoxinus* (L.) and three spine stickleback *Gasterosteus aculeatus* L. from an upland reservoir system Co. Wicklow Ph.D. Thesis , University College Dublin .
  12. Dauod, H.A.M; Al- Rubai ,R.K.S. and Al Douri , T.Y. (1999 a) . The Veterinarian, 9(3): 64-79.
  13. Dauod , H.A.M.; Al Rubai, R.K and Hammady, A.A.(1999b) .Ibn AL- Haitham J.Pur .Appl.Sci 12(2): 9-21
  14. Nikolisky ,G.V.(1963) .The ecology of fishes Acad. Press. London
  15. Wahbe, M.I. and Ajil, A.(1985) J. Fish Biol .27:147-154.
  16. Daoud, H.A.M. and Hammady , A.A.(2000) . J.Diyala Sci. Educ. Res. 1(8) : 11-15.
  17. Thomas , J.D (1962) . J.Anim. Ecol. 31: 175-205.
  18. Maitland, P.S. (1965) . J.Anim.Ecol. 43:109-133.
  19. Pedley, R.B.and Jones , J.W.(1978). J.Fish . Biol. 12:239-256.

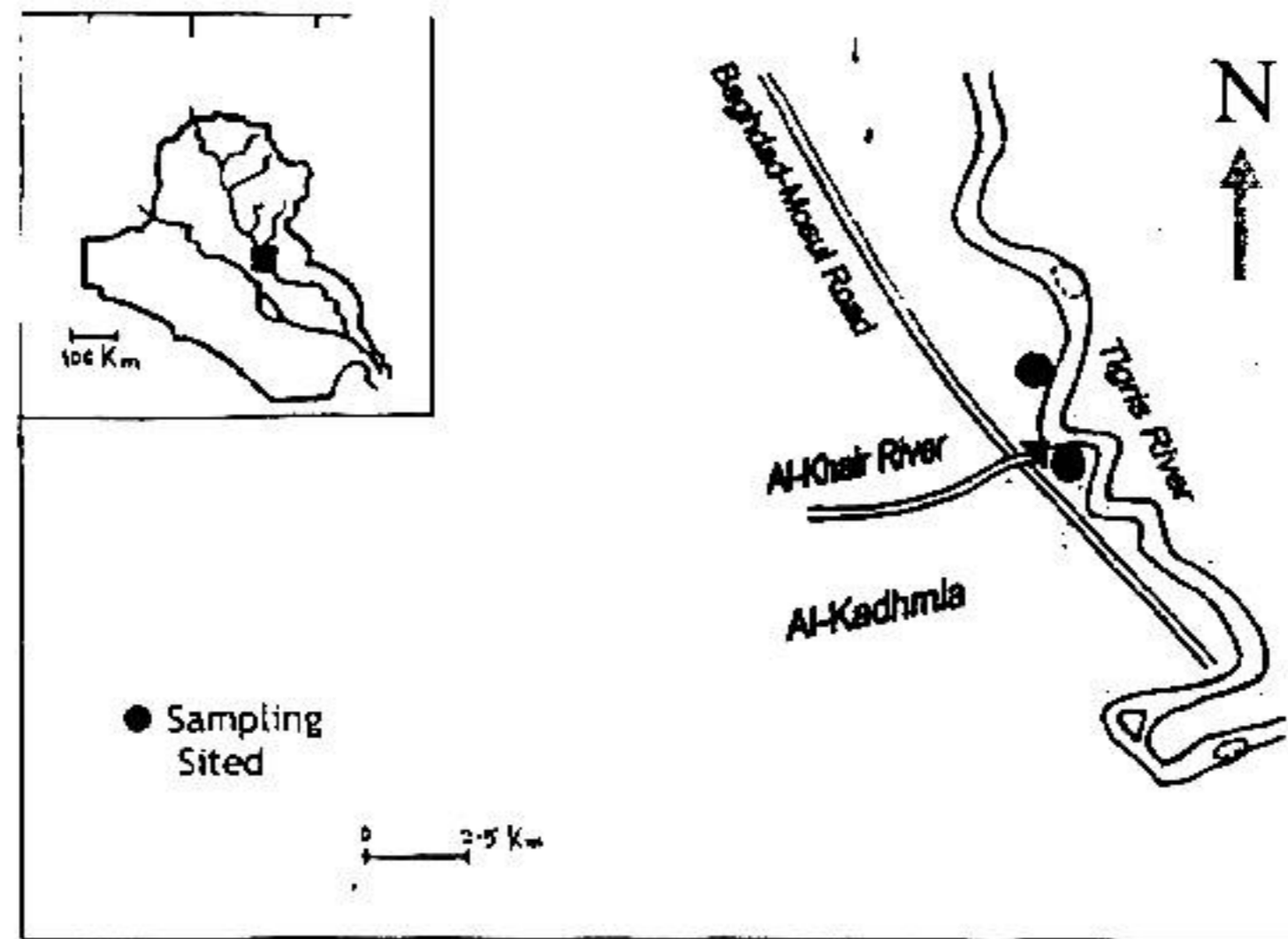


Fig (1) Location of Study area indicating sampling sites.

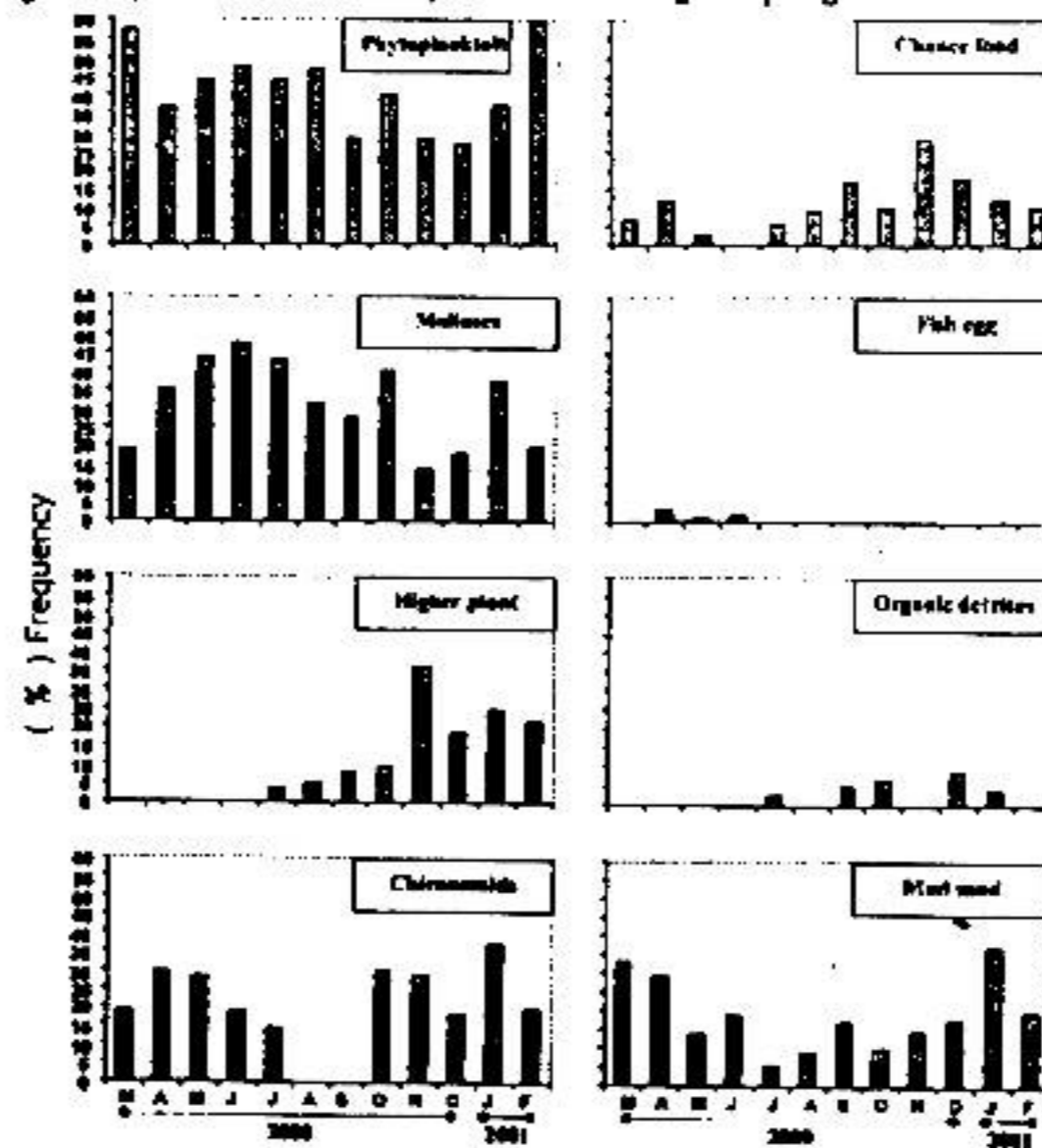


Fig (2) Frequency of occurrence of each food category.

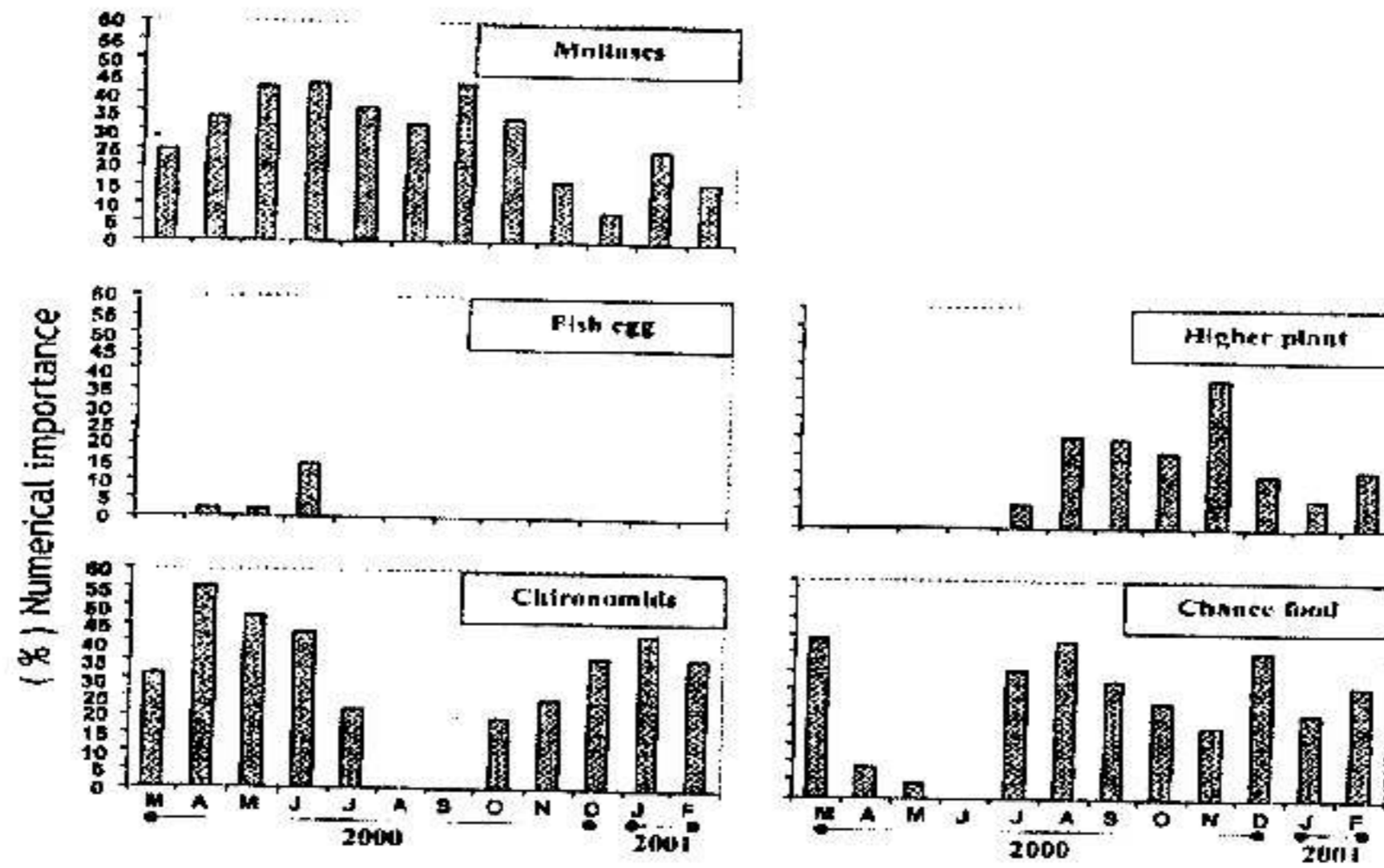
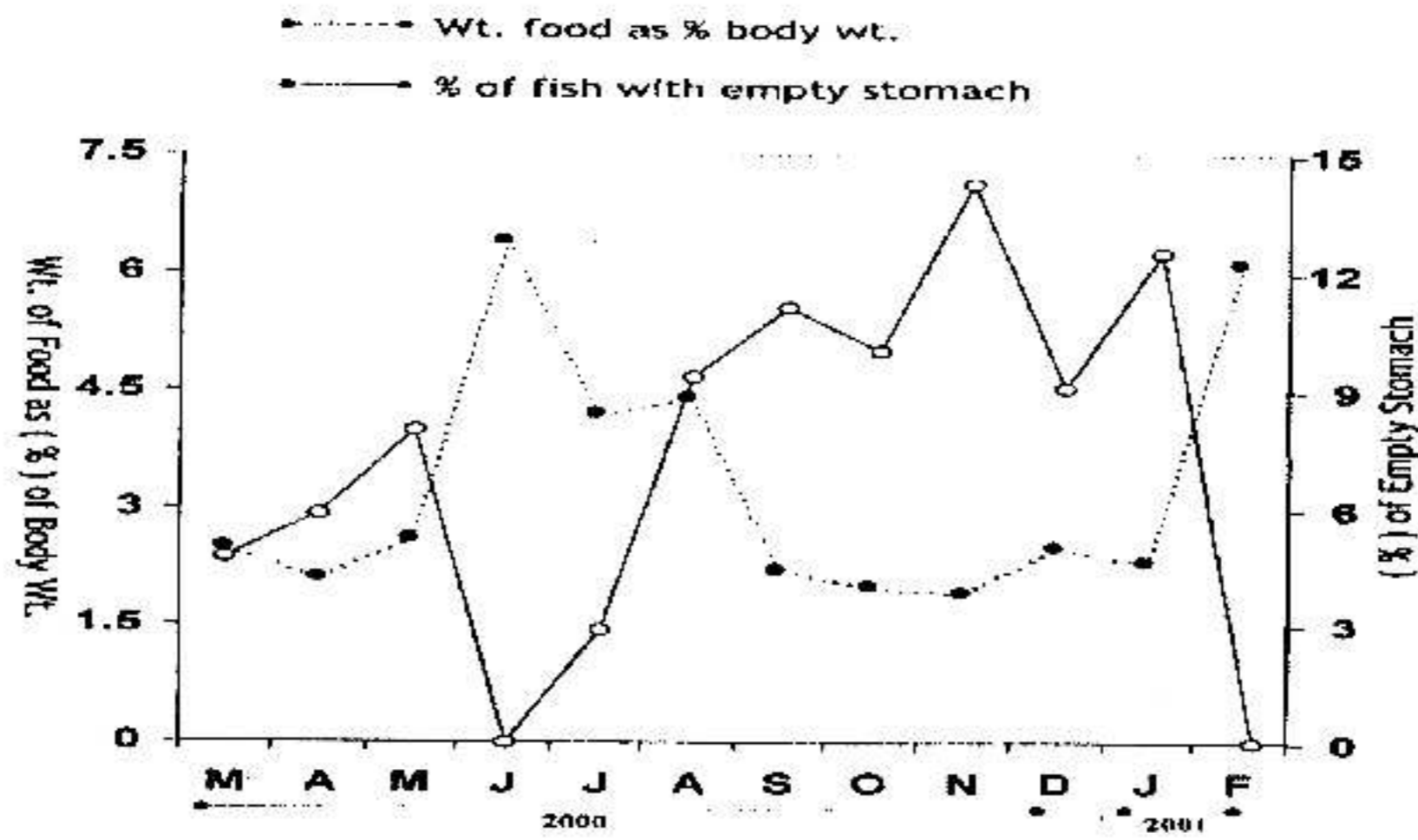


Figure (3). Numerical importance % of each food category.



Figure(4). Monthly variation in the rate of feeding of *H. fossilis*.

الغذاء وعادات التغذية في سمكة الجري اللاسع ( الجري  
الهندي ) (*Hetropneustes fossilis* (Bloch) في نهر  
دجلة عند منطقة الكاظمية - شمال بغداد

حسين عبد المنعم داوود

قسم علوم الحياة ، كلية التربية ابن - الهيثم ، جامعة بغداد

### الخلاصة

تمت دراسة الغذاء وطبيعة التغذية في سمكة الجري اللاسع (*Hetropneustes fossilis* (Bloch) ، ومن خلال عينات شهرية تم الحصول عليها خلال المدة من اذار 2000 الى شباط 2001 ، باستخدام شبك سلية Cast Nets ذي فتحات صغيرة ، حلت محتويات المعدة للاسماك التي صطيدت 197 سمكة اذ اظهرت ان النوع موضوع الدراسة يتغذى على طول عمود الماء ( القاع ، منتصف عمود الماء والسطح ) وان الغذاء الرئيس كان يتمثل بالطحالب ، والنواعم ويرقات وعذارى الهاموش ، فضلا عن النباتات المائية ، وان السمكة تفضل ان تكون لاحمة في تغذيتها . درست التغيرات في شدة تغذية النوع موضوع الدراسة واوضحت النتائج ان اعلى مستوى في شدة تغذية النوع موضوع الدراسة لوحظ خلال اشهر الصيف، بينما لوحظ ادناها خلال اشهر الخريف ويبدو ان التغيرات في نشاط التغذية يتأثر بمدى ما توافر من غذاء ضمن البيئة وانخفاض درجة الحرارة وربما يعود لعادات التغذية للنوع موضوع الدراسة .