Nat. Volatiles & Essent. Oils, 2021; 8(6): 2579-2587

NVEO
Natural Volatiles &
Essential Oils

Natural Feeding Of Gettan Luciobarbus Xanthopterus In Hamrin Dam Lake

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Abstract

The natural nutrition of Luciobarbus xanthopterus was studied in Hamrin Dam lake for the period from July 2020 to June 2021. 116 specimens of Luciobarbus xanthopterus (Heckel,1843**)** with lengths ranged between 24 to 87 cm and their weights from 124.74 to 6160.4 g at ages 2 to 7 years. The anterior part of the alimentary canal of the caught fish, was studied the results showed that food of animal origin. 85.17% and food of plant origin Fig. 14.53. with the IRI significance level index. The highest feeding intensity was recorded in April 2021, reaching 28.33 points/fish, and the lowest in February 2021, at 13.33 points/fish. The feeding activity of Luciobarbus xanthopterus fish increased with the increase in water temperature in summer compared to winter season.

Key words: Luciobarbus xanthopterus, Natural Feeding, Hamrin Dam Lake,

Introduction

Fish is an important source of animal protein, it is the main source of national income in some countries of the world (FAO, 1997). Luciobarbus xanthopterus belongs to the family Cyprinidae, and it is one of the economically important Iraqi fish and is endemic to fresh water in the Tigris and Euphrates rivers (Coad, 2010) The In view of the commercial importance of Gattan fish, many local studies have been conducted on it in many environments of Iraqi waters, including rivers, lakes, reservoirs, and the Tigris and Euphrates rivers (Al-Tamimi, 2004; Khalaf, 1991), and some of them were interested in its spread and growth (Al-Rudainy et al., 1999; Abu Al-Heni and Al-Rudainy, 2000) Some of them studied its environment, its life and its stock (Al-Rudainy and Al-Nasiri, 2004) and others dealt with its life and nutrition (Al-Rudainy, 1989).

study of the natural nutrition of fish and natural food in water bodies and the relationship between them is one of the important and basic steps for the development of fisheries, it is necessary to know its vital effectiveness, including its nutrition, and knowing what fish eat from natural food helps in achieving the development of fish in water bodies and fish farms because food plays a role Important in the growth and reproduction of fish (Al Kaabi, 2005; Al Shammaa, 1999)

Iraqi fish, includin Luciobarbus xanthopterus, have been subjected to a deterioration in their living and breeding places and their natural environments, as their numbers decreased and disappeared from most of the southern marshes after they were subjected to drying in the early nineties, in addition to the construction of dams that affected the reproductive migration of fish (Al-Shamaa, 2005; IUCN, 2010; UNEP, 2001). The intestine occupies the largest part of the abdominal cavity of fish and due to the absence of a stomach in the Gattan fish, the frontal area of the intestine was characterized by its wideness compared to the rest of the intestine and it forms an elongated bulge called the Intestinal Bulb (Shuber and Al-Radini, 2012; Khalifa et al ,2020) The current study aimed to determine and identify the natural food of fish in Hamrin Dam lake.

Description of the study area

Lake Hamrin is located in the Diyala Governorate in eastern of Iraq, on Diyala River, at a distance of 120 km northeast of Baghdad, between longitudes 44-45° and 15-45° east, and latitudes 55-33° and 30-34°N (Al-Nairi, 2008) as shown in Figure (1)

The lake contains several species of fish, including the common carp Cyprinus carpio, Barbus esocinus, Luciobarbus xanthopterus, Aspius vorax, and brown Mesopotamichthys sharpeyi, which are prevalent in the lake, as well as other species of different densities such as Bagridae, Silurus pelusobar, and Redfish. Mastacembelus mastacembelus, the rough Planiliza abu, the big-mouthed brown Cyprinion macrostomus, while the reed plants danaxi Arundo, Tamarix aphylla, Potamogeton pectinatus, and Ceratophylum demersum are found in the lake.

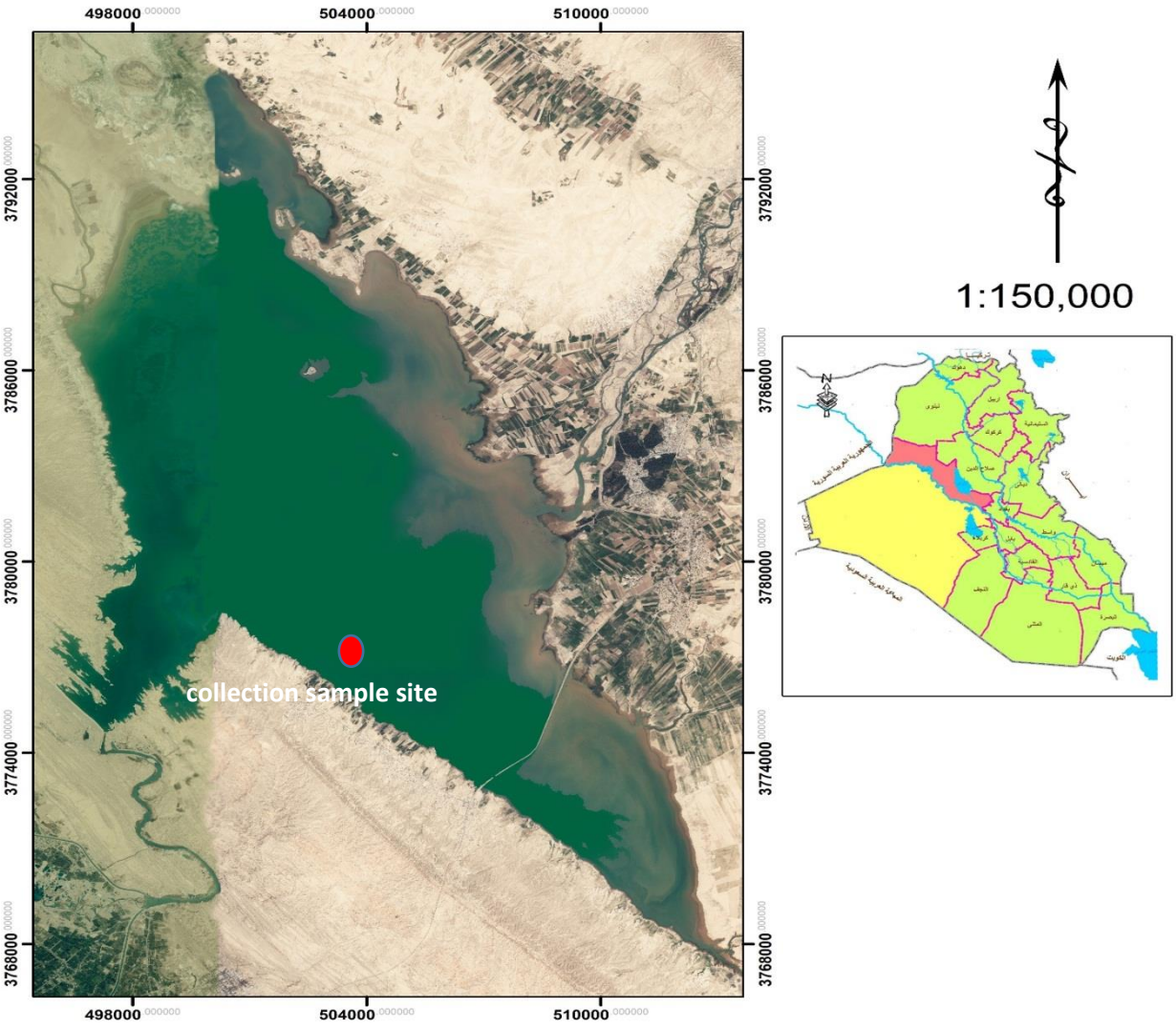

Figure 1. Hamrin Dam Lake

Materials and methods

116 Fish of Gattan Luciobarbus xanthopterus fish were collected from Hamrin Dam Lake for the period between July 2020 and June 2021. The total lengths of the fish caught ranged between 24 to 87 cm, and their ages were 1-6 years. I caught fish using karfa nets, The ages of fish were measured by calculating the number of annual rings in fish scales using a BEL PHOTONICS projectina device equipped with a screen showing the annual rings of the scales, and the lengths of fish were measured using a graduated metric ruler. The anterior third of the alimentary canal was cut and its contents were emptied into a petri dish and examined under a digesting and compound microscope with magnification of 40x and 450x to know the components of food in the alimentary canal. Feeding intensity and feeding activity were calculated according to the two equations:

Feeding intensity = sum of fullness index scores ÷ number of fish fed (Dipper, 1997)
Feeding activity = (number of fish fed ÷ number of fish examined) x 100 (Gordon, 1977)
In studying food, it relied on the two repetition methods Occurance (O) and Point (P) (Hynse, 1950; Hyslop, 1980)
According to the Index of Relative Importance (IRI) Important Ranking Index for each food ingredient through the following equation:
IRI= (O% × P% / ∑P% × ∑O%) × 100 (Stergiou,1988)
It represents:
IRI = Index of Relative Importance.
O% = Frequency of Occurrence.
P% = Points.

Results and discussion

1 - Feeding intensity and activity of the fish

Figure (2) shows that the highest feeding intensity was recorded in April 2021, amounting to 28.33 points/fish, followed by 26.6 in May 2021, points/fish, and the lowest feeding intensity recorded in February 2021, reaching 13.33 points/fish, feeding activity ranged between 72.7-100% and the lowest feeding activity was recorded in September at a rate of 72.7% (Figure 3)

The current results differed from the results of Salman (2006), as the highest intensity of feeding was recorded in October and reached (21.33), and the lowest was recorded in December and was (12.08) in Lake Tharthar. It is noted that the intensity of feeding increased during the summer and spring months due to the abundance of food during this period and the increase Nutritional activity of fish. It is also noted that the fish caught in this study and during the summer period were relatively small in size and this leads to varying feeding activity and intensity. This explains that large fish need to build gonads as well as fish that regrow their gonads during or after spawning (Al-Bayati, 2000) compared to small fish that are active feeding, especially during the winter months near hot flows (Kusabs et al., 1990). Nutrition in the current study is based on the study of Al-Kaabi et al. (2017), as it ranged between 79.31 to 96.66% in the Euphrates River at the city of Musayyib.

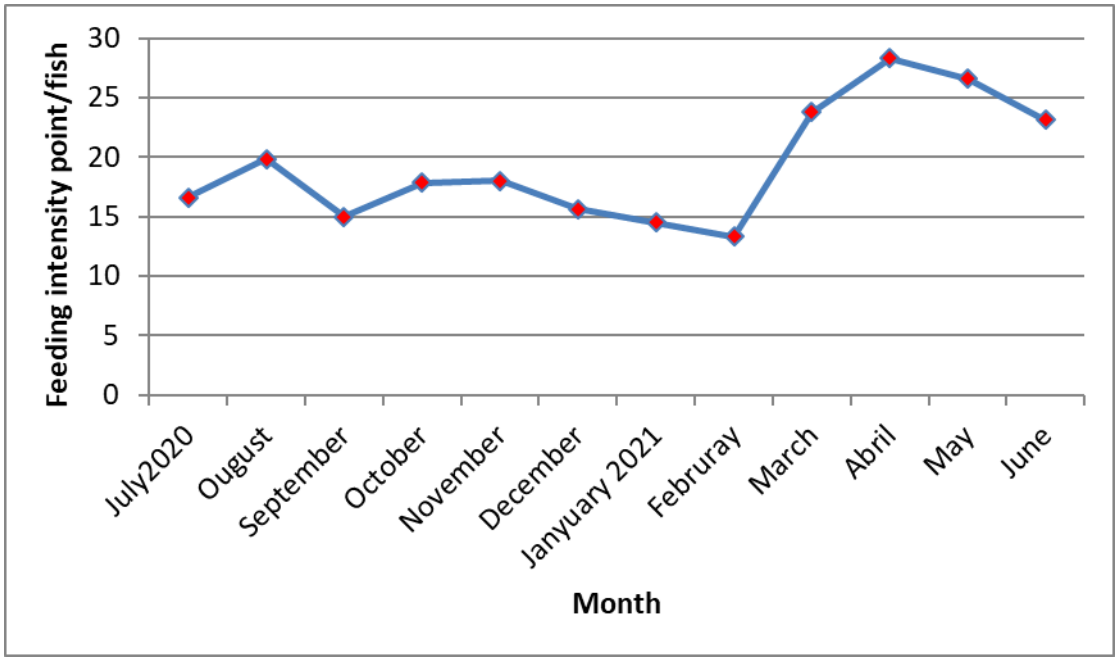

Figure 2. feeding intensity of Gattan (Luciobarbus xanthopterus) in Hamrin Dam lake during the study period

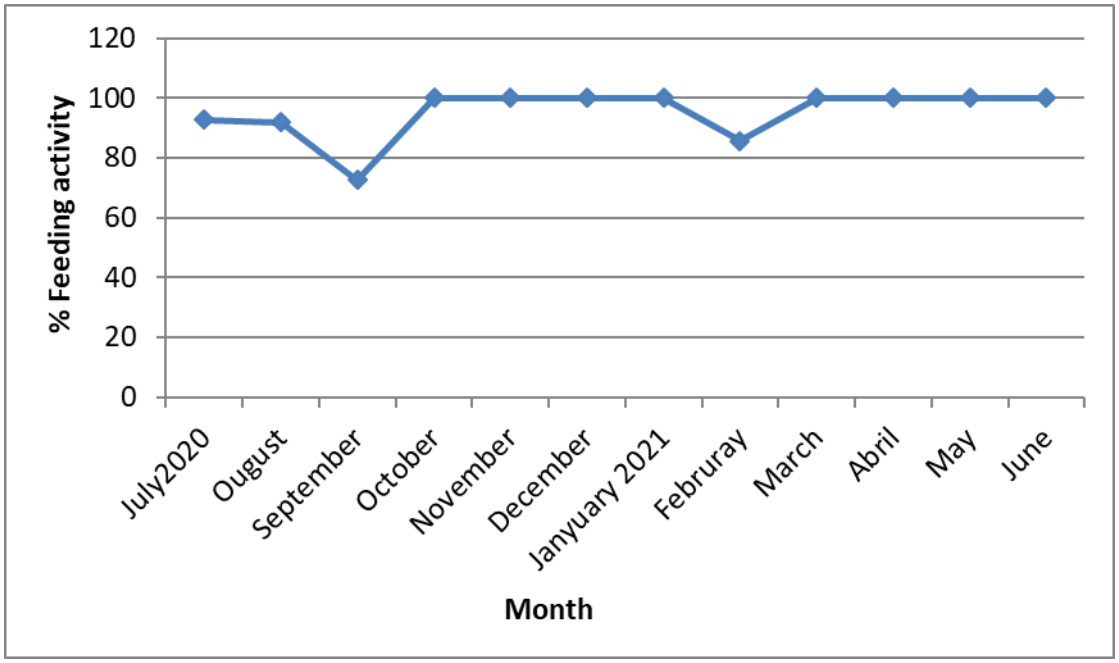

Figure 3. Feeding activity rate of Gattan (Luciobarbus xanthopterus) in Hamrin Dam lake during the study period.

2- food ingredients

The food of the Luciobarbus xanthopterus fish included a wide range of food components in varying proportions, which included 11 types of food, including the insects and their larvae, diatoms, fish remains, digested food, snails, molluscs, zooplankton, organic matter, aquatic plants and algae. Hill and Yanong (2002) note that the family of carp It

consumes a wide variety of food including zooplankton, insects, crustaceans and algae. It is clear from Table (13) and Figure (20) the food items eaten by the Luciobarbus xanthopterus fish in Hamrin Dam lake during the study period. It was found that insects and their larvae occupy the first and highest importance among the food components in the alimentary canal in general, and they constituted 37.71% evidence of the level of importance, followed by fish residues 20.04%, zooplankton 17.31%, then organic matter 10.95%, then catfish 7.64%, then snails 2.47%, then Undiagnosed digested food 1.93%, diatoms 1.30%, aquatic plants 0.16%, algae 0.19%, sand and clay in the last rank, with a small percentage of 0.016%.

By collecting the animal and plant components that make up the food of the Luciobarbus xanthopterus fish in the Hamrin Dam Lake, the animal food formed 85.17% of the total food and the remaining percentage is algae, plants and other materials. animal. This is consistent with what was mentioned by some previous local studies (Al-Shamma' and his group, 1999 ; Al-Mashhadani and Al-Shamma', 2002) in the predominance of animal components with a percentage of 78.09% and 71% of the natural diet of Luciobarbus xanthopterus fish in the lakes of Dukan Dam and Habbaniyah, respectively.

Table 1. Percentages of nutritional components of Qattan fish in Hamrin Dam lake during the study period, calculated by frequency methods (O%), points (P%) and Important Ranking Index (IRI%)

Ingredients	Frequency O%	points P%	important ranking index IRI%
Insects and their larvae	18.51	28.99	37.71
diatoms	5.54	3.36	1.30
fish leftovers	15.95	17.88	20.04
digested food	6.49	4.24	1.93
snails	6.11	5.76	2.47
Molluscs	11.62	9.36	7.64
zooplankton	15.22	16.41	17.31
organic matter	14.59	10.68	10.95
aquatic plants	2.57	1.23	0.41
algae	3.04	0.91	0.19
sand and mud	0.36	0.23	0.016

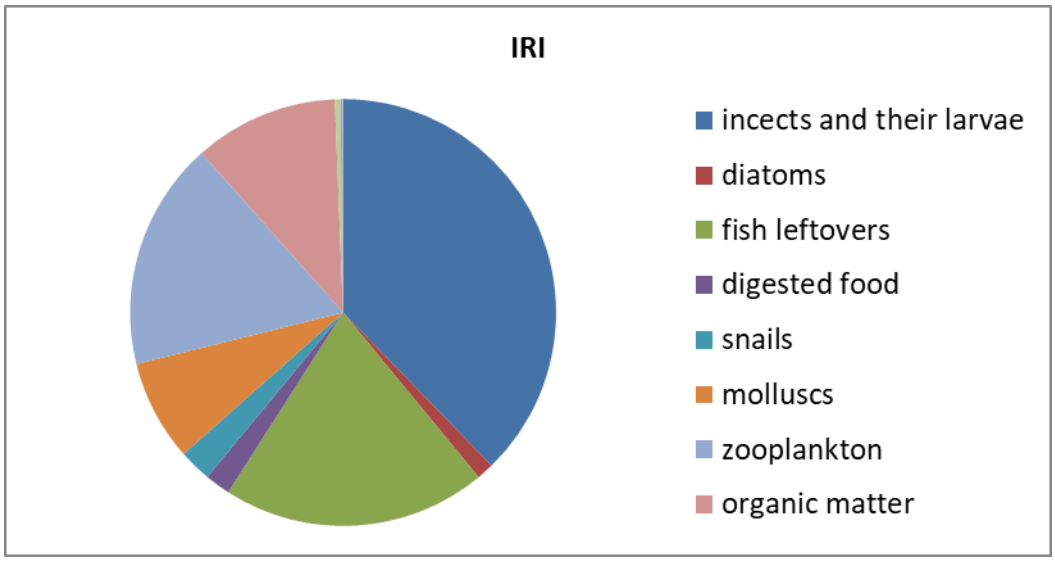

Figure 4. Percentages of nutrients in the gut of Gattan by the Important Ranking index method during the study period

3- Seasonal changes in fish diet

It is noted from Table (2) the seasonal changes in the importance of each type of food. It is noted during the summer that insects represent the first rank in terms of importance, amounting to 34.21%, followed by fish residues in the second degree, at a rate of 23.25%, then zooplankton, then followed by organic materials in the fourth place, with a rate of 10.84%, with evidence The level of importance and the lowest percentage in the summer was recorded for algae and amounted to 0.06% as an indication of the level of importance, Insects ranked first in the fall season as well, with a percentage of 35%, according to the level of importance, followed by organic materials, with a rate of 19.56%, according to the level of importance. Autumn season, at a rate of 0.14%, indicative of the level of importance.

In the winter season, insects and their larvae also ranked first in fish food, with a rate of 31.76% in the importance level index, followed by fish in the second place with a rate of 19.52% in the importance level index. then zooplankton, 19.49%, according to the level of importance, then the organic matter, and 15.49%, according to the significance level index, and the lowest percentage recorded during this season was for plants, and the significance level was 0.006%.

In the spring season, insects recorded the highest percentage of food, according to the significance level index of 38.71%, and this percentage is the highest percentage of insects for the different seasons of the study, while fish ranked second during this season with a rate of 17.83% according to the significance level index and their proportions were equal with zooplankton, while snails came ranked fourth, with a rate of 10.28%, according to the level of importance, Algae recorded the lowest percentage during this season and was 0.37% as an indication of the level of importance.

The current results differed from the study of Al-Shammaa et al. (2009), who found that the undiagnosed digested food was the highest for all seasons with an importance level of 31.8%, followed by larvae of 21.5%, and insects ranked third with a percentage of 15.0%.

Table 2. Percentages of natural food for Qattan during the different seasons in Hamrin Dam lake calculated by P (points) method, O (frequency) and Important Ranking Index IRI

	summer			Autumn			winter			spring		
food ingredients	O%	P%	IRI	O%	P%	IRI	O%	P%	IRI	O%	P%	IRI
Insects and their larvae	18.90	30.16	34.11	17.71	29.99	35.10	18.26	28.24	31.76	18.63	27.42	38.71
diatoms	4.65	2.93	0.80	8.23	1.94	1.04	3.03	1.66	0.30	8.86	6.9	4.63
fish leftovers	18.33	21.05	23.25	13.55	14.75	13.14	17.54	18.07	19.52	14	16.81	17.82
digested food	_	_	_	14.34	9.12	8.58	11.48	6.72	4.75	_	_	_
snails	8.46	9.05	4.59	_	_	_	0.04	2.5	0.62	11.8	11.5	10.24
molluscs	8.64	8.92	4.62	8.62	8.80	4.97	11.85	10.97	8.00	10.7	8.71	7.06
zooplankton	17.84	15.86	16.93	15.69	16.81	17.33	18.26	17.33	19.43	15.13	15.55	17.83
organic matter	17.63	10.25	10.84	17.78	16.76	19.52	18.26	13.78	15.44	4.33	3.66	1.20
aquatic plants	2.2	1.1	0.14	3.14	0.72	0.14	0.64	0.16	0.006	9.26	2.94	2.06
algae	2.2	0.5	0.06	_	_	_	1.65	0.43	0.043	3.8	1.3	0.37
sand and mud	_	_	_	14.16	0.93	0.25	_	_	_	_	_	_

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