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ECOLOGICAL AND BIOLOGICAL OF KHASHNI FISH *LIZA ABU* (HECKEL, 1843) ON EUPHRATES RIVER PASSAGE THROUGH SAMAWAH CITY

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Abstract

A total of 90 Khashni fish were collected to evaluate the ecological and biological study on Euphrates river passage through Samawah city from September 2016 until April 2017. 8-15 cm and 8-36 gm, differ length and weight of fish, the traits were sex ratio, Ganado somatic index, hepatic index, the static body coefficient and the relation between length and weight. The results showed that a sex ratio in a female was a higher in April (1: 2.66), increased of Ganado somatic and hepatic index in male (13.19 and 6.59%) compare female (10.78 and 5.35%) in the same month, in January month, the static body coefficient was a higher in male (64.65%) compare with female (53.62%). The correlation coefficient of length and weight were 0.99 in khashnii fish.

Key words: Ecology, Biology, *Liza abu* fish, Age and Growth .

Introduction

The fish farms in Iraq suffered to many problems affecting on fish growth leads to decreased of their productive, the fish importance resource of the world which provide 24% of animal protein (Hassan, 1993). Must be care of natural and industrial diet to increased fish productivity (Harrison, 1993). Actinopterygii is a large and widespread group in many aquatic surfaces, the order of this breed was Mugiliformes, it includes two types Khashanii and Bayah fish (Nelson, 1994 and Al-Daham, 1984). There are more than one hundred species of wild fish spread all over the world such as the Arabian Gulf, South Indian Ocean, Australia, the coasts of the United States and the eastern coast of Africa, as well as a large preparation in the rivers, lakes and marshes of Iraq, the species Bayah belong to Mugilidae family, which includes many species found in the Iraqi inland waters one type is the Khashanii fish *Liza abu* (Heckel) locally named (Abu Khraiza), It is an important economic fish in the central and southern areas of Iraq for availability and cheap compared to larger Iraqi fish such as Shaboot (*Barbus grypus*), Kattan (*Barbus xanthopterus*) and Bonny (*Barbus sharpyi*) (AL-Shamma *et al*., 2009).

Khashanii fish was gave interesting enough to study the reproduction in a manner that is proportional to the spread in Iraqi waters, especially in the southern regions, and its importance in Iraqi waters to large segments of Iraqi society in the center and south, especially for those with limited income. The aim of this research to know many information about reproduction and fecundity of *Liza abu* fish in water surfaces.

Materials and methods

Sampling

Liza abu samples were collected from the Euphrates river passage through Samawah city, using the Salya nets to get a samples, the samples were collected from January to April 2017. The fish obtained were placed in containers had ice to protect them from damage until they were transferred to the laboratory.

Laboratory work

The frozen fish were placed under the tap water to ice removed. then dried and weighted by a sensitive balance and Measure length by measuring ruler, taked 3-4 scales per fish from the dorsal area below the lateral line, and placed in dishes (Petri dish) was added to the washing solution (potassium hydroxide KOH) by (5 g/ 100 ml distilled water) and leave for 24h.The scales were measured the next day after cleaning, drying and placing them between tow slides to know the ages. The age of fish was measured using a scientific microscope at (10×) magnification. The fish body was then cut from the abdominal side to remove the gonads and measured nearest 0.01 g. GSI (Gonads Somatic Index) based on the percentage of transporter relative to g total body weight and liver weight relative to body weight were calculated according to (Htun-han 1978) as follows:

$$GST = \frac{Gonad\ \ weight\ _{EgmF}}{Body\ weight\ _{EgmF}} \times 100$$

$$Heatic\ Index = \frac{Liver\ \ weight\ _{EgmF}}{Body\ weight\ _{EgmF}} \times 100$$

$$Body\ conditon\ Coefficien\ t = \frac{Body\ weight\ _{EgmF}}{Cubic\ Length\ _{Ecm^3 F}} \times 100$$

The monthly sex ratio was calculated by dividing the number of females to the number of males. For the purpose of finding the relationship between total length and weight of fish, the logarithmic equation was used (Pauly *et al*., 1993):

Log W =Log a +b Log L

Where b is the regression coefficient, Log L is the total length logarithm, and log W is logarithm is the total weight. The regression coefficient is derived from the following equation:

$$b = \frac{N_{\ddot{u}}\ LOGl \times Log\ w - Log\ w \times \ddot{u}\ Log\ l}{N_{\ddot{u}}\ \ddot{u}\ Log\ L_2 - Log\ L_{\ddot{u}F}{}^2}$$

By knowing the value of the regression coefficient, the log a value, which represents the intersection point of the straight line with the y-axis, represents the weight. The correlation coefficient (r) was extracted by the following equation:

$$r = \ddot{u}_{\ddot{u}x}\ \frac{_{\ddot{u}}\,xy =}{xt2 -_z}$$

The data were statistically analyzed using complete randomized design (CRD) and the use of the Duncan (1955) test to test the significance of the differences between the coefficients and the test level 0.05.

Results and discussion

The ages of khashini fish between (1^- to 1^+ years) in the Euphrates River in the section passing through the city of Samawah in the district of Al-Khaddar/Al-Ghadiriyah region. Table (1) shows the lengths, weights and numbers of these fish in the Euphrates River. The number of fish varied from month to month, and the highest percentage was in March (27.2%). The weights were the highest in November and the percentage of weights in the same month reached 19.20%.

Table (2) indicates that the number of males caught from the Euphrates River exceeded the females during the period of study. Ninety species of fish were identified, of which 46 males and 44 females. The sex ratio was highest in April at 1:2.66 and the lowest value in January was 1:0.57, the sex ratio in many species approaching to (1) and may vary or from one fish to another for the same species or from one year to another in the same fish group (Nikolsky, 1963). Some studies have shown that males of khashini fish precede and are present before females in spawning development over a month, which is likely to increase the sex ratio for male khashini fish. (Abd-ALsamad, 2001) noticed sovereignty females on mals in spawning months.

As for the GSI, table (3) showed the highest percentage in April (13.19% for males and 10.78% for females). This is consistent with Htum-Han (1978) In the longitudinal function in fish include many changes in GSI all year (Wooten and Mills, 1979), maturation of ovaries is associated with attenuation in liver and muscle, whereas Treasure and Holliday (1981) suggest that the cause of change in the value of the fungal function of *Perca fluviatilis* fish is due to the change in gonad weight as well as changes in the stages of development within the ovary. The results of the current research were consistent with the reproductive period of Khashini with other research conducted in Al-Hammer marsh (Naama, 1982) with one breeding cycle for this fish. And showed slight differences from those recorded by Wahab (1986) in the fact that the spawning of the khashini fish reaches in February. The time of slowness and the process of

Table 1: Lengths, weights and numbers of khashini fish in the Euphrates River during the study period

Months	Number	Number %	Weight (gm)	Weight %	Length Ranges (cm)	Weight Ranges (gm)
September 2016	10	11.11	132±1.64d	10.30	14-8	30-12
October	13	14.44	166±3.22c	12.95	15-10	22-10
November	14	15.55	246±2.83a	19.20	14.5-10	18-12
December	9	10	102±1.43e	7.96	13-9	20-11
January 2017	11	25	221±2.31b	17.25	14.5-10	36-12
February	10	22.7	133±1.73d	10.38	12.5-10	18-10
March	12	27.2	157±3.46c	12.25	12-9.5	16-8
April	11	25	124±3.44d	9.67	15-9	12-10
Total	**90**		**1281**		**15-8**	**36-8**

·Mean ± Standard error. * Different characters indicate significant differences on (P < 0.05).

Table 2: Monthly preparation and sex ratio of Khashani fish during the study period.

Months	Male no.	Female no.	Sex Ratio F:M
September 2016	5	5	1:1
October	8	5	1.6:1
November	6	8	0.75:1
December	4	5	0.8:1
January 2017	4	7	0.57:1
February	6	4	1.5:1
March	5	7	0.71:1
April	8	3	2.66:1
Total	46	44	90=44+46

evolution of the seed is associated with temperature and the process of evolution of the gonad is an adaptation to the ecological conditions experienced by the fish. The growth and development of gonads in the species is positively correlated with the fish status factor.

Table 3: GSI and HI and Body Condition Coefficient of male and female Khashini fish during the study period.

Months	GSI %		HI %		Body Condition Coefficient%	
	Male	Female	Male	Female	Male	Female
September 2016	8.32±1.7e	10.13±1.8b	4.66±0.5c	3.10±0.34c	53.20±3.20b	40.12±2.28b
October	9.80±1.8d	10.24±1.7b	6.30±0.6a	5.26±0.35a	42.11±2.87b	26.18±2.32d
November	10.60±1.6c	8.34±1.6d	5.20±0.6b	6.11±0.37a	30.12±2.67c	30.40±3.40c
December	11.22±1.8b	9.42±1.8c	3.08±0.7d	4.12±0.35b	44.04±2.86b	36.72±3.22c
January 2017	9.58±1.7d	10.12±1.85b	5.47±0.91b	5.30±0.30a	64.65±3.21a	53.62±2.30a
February	9.94±1.3d	9.09±1.25c	5.66±0.81b	3.03±0.60b	3.03±0.60b	35.62±2.16c
March	7.93±1.5e	9.53±1.73c	4.76±0.90c	5.29±0.63a	5.29±0.63a	38.53±2.64c
April	13.19±1.1a	10.78±1.16a	6.59±0.98a	5.35±0.60a	5.35±0.60a	30.32±2.62c

·Mean ± Standard error . * Different characters indicate significant differences on ($P < 0.05$).

GSI and HI is an important indicator that helps to determine the period of spawning in fish in conjunction with other indicators appearance and tissue, was noted in table (3) Hepatic Index reached in April for male fish 6.59% as well as female 5.35% In the same month compared with the other months was increasing position. This indicates that HI of both sexes increases during spring and this is consistent with (Bulow *et al.*, 1978). Some researchers (Harday and Keay, 1972) that liver weight increases in females during the spawning period, either Body Condition Coefficient is evidence of the change in the reserves of energy stored in the muscles. It is noted from the table that the height of Body Condition Coefficient for both sexes in January was 64.65% and 53.62% for male and female fish, respectively and gradually decrease until April, A direct correlation between Body Condition Coefficient and HI, which was also high during January, and a reverse correlation between Body Condition Coefficient and GSI. This is consistent with Htum-Han (1978) and Medford and Mackay (1978) they noticed decline body weight of females of *exos iuecius* fish before spawning is due to the increased amount of content in the ovaries are drained into the muscles. Either (Wooton *et al.*, 1978) observed a decrease in the values of the Body Condition Coefficient during the spawning period of *Gasterosteus aculeatu* fish and attributed this to changes in muscle stock and ovaries, respectively.

Table 4: Relationship of total length with total weight of khashini fish during the study period.

Months	Total Length (cm)	Total Weight (gm)	Log L	Log W %	LogW× Log L	$(Log\ L)^2$
September 2016	126	132	2.10	2.12	4.45	4.41
October	118	166	2.07	2.22	4.59	4.28
November	120	216	2.08	2.33	4.84	4.32
December	105	102	2.02	2.00	4.04	4.08
January 2017	128	221	2.10	2.34	4.91	4.41
February	114	133	2.05	2.12	4.34	4.20
March	112	130	2.04	2.11	4.30	4.16
April	113	124	2.05	2.09	4.28	4.20
Total			**16.51**	**17.33**	**35.75**	**34.06**

As for the relationship between length and weight, it can be observed in table (4), which indicates a positive relationship between length and weight. Some studies (Yousif, 1983, and Abdel Samad, 2001) indicate that the growth of khashini fish is asyometrical. This indicates that the increase in length and height is consistent so that the specific weight of the fish has a fixed length of life. Any difference in the relationship between length and weight occurs as a result of oscillations in the weight of the viscera and tissues and gonads weight. The regression coefficient (b=1.04) indicates that fish growth is Allometric and both sexes of fish in Muthanna province and this is not

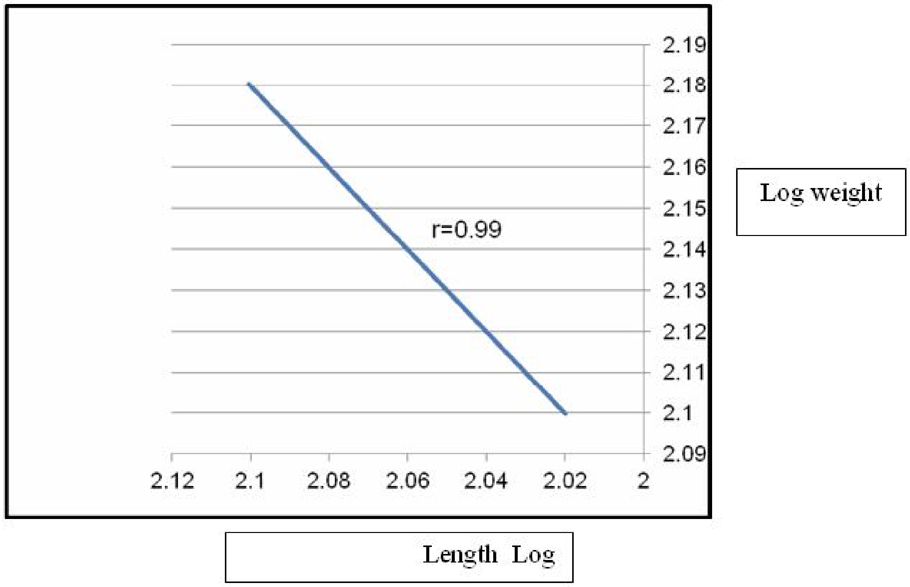

Fig.1: The relationship of logarithm length with logarithm weight for both sexes of the coarse fish caught from the river Euphrates in Muthanna province.

consistent with AL-Alusi study (1998) for khashini fish. It was found that the regression coefficient for both sexes is the Isometric standard of fish in the Upper Euphrates in Anbar province. This indicates that there are many factors affecting the value of the regression factor in fish, including embryonic changes, fish feeding, sexual maturity, age difference, and disease incidence (Yilidrim, 2001).

From table 4 draw fig. 1 illustrates the relationship between the total length logarithm and the logarithm of weight and the extraction of the coefficient of correlation coefficient r, which is 0.99. This indicates a significant relationship between the two variables, this positive relationship, when length increase weight increase of khashini fish in both sex.

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