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Effect of seasonal variation on GOT, GPT, and ALP enzymes of *Chelon Labrosus* (Risso,1826) in Umm Hufayn - Eastern Libya

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Abstract: seasonal variation one of the most an important phenomena which are the effect on most animals in the environment, this is study concentrate on understanding the effect of seasonal variation on GOT,GPT and ALP and the results revealed that, the levels of GOT, GPT, and ALP enzymes of *Chelon Labrosus* during four seasons, The assayed GOT and GPT levels were markedly increased during autumn comparing with winter while ALP level almost remained stable.

Key words: seasonal variation, GOT, GPT, and ALP enzymes, *Chelon Labrosus*.

الملخص :

يعتبر التغيير الموسمي من اهم الظواهر التي تؤثر على معظم الحيوانات في البيئة ، وتركز هذه الدراسة على فهم اثر التباين الموسمي على GOT و GPT و ALP وقد اظهرت النتائج ان مستويات GOT، إنزيمات GPT و ALP في *Chelon Labrosus* خلال الفصول الأربعة، زادت مستويات GOT و GPT المقايسة بشكل ملحوظ خلال الخريف مقارنة بالشتاء بينما ظل مستوى ALP مستقرًا تقريبًا .

Introduction:

Seasonal variation effect directly on various aspects in ectotherms such as life history, immigration, emigration, body physiology, growth rate and reproduction [1]. Ectoderms' animals exhibit a variety of many physiological strategies as response to different environmental conditions [2]; [3] and [4]. in eastern Libya, there is no information about the effect of seasonal changes on the physiology of some fish, Especially the climate in Libya seasonal, consisting of four seasons, Therefore, this paper aims to study the effect of seasonal changes on some physiological parameters of *Chelon Labrosus* in Umm Hufayn Eastern of Libya.

Marital and methods: Umm Hufayn is a relatively small lagoon located about 80 km east of Derna in the direction of Tobruk Fig.1. It is connected to the open sea through a gate sized about 0.5 Km, through it seawater enters the lagoon on tide times. Underground springs at the inner side of the Lagoon discharge water [5].



Fig. 1. Umm Hufayn lagoon - Eastern Libya

Collection of fish and blood samples: A total of twenty fish adults of *Chelon Labrosus* were collected during each season from Umm Hufayn lagoon and blood was rapidly drawn from the caudal vessel or heart of each fish (Fig. 2 & Fig. 3) according to Hrubec et al. [6] and In the laboratory stored serum samples were analyzed in University Lab.



Fig.2.collection the blood from caudal peduncle



Fig.3. Collection of fish Blood by heart puncture

Statistical analysis:

Data were presented as means \pm standard error (SE). The statistical analysis was performed with multi-variant analysis of variance (ANOVA) using SPSS (version 15) software package for Windows comparing the multivariations between the groups. F-test was calculated and considered statistically significant at $p < 0.05$.

Results : Tables (1) and figures (4-6) illustrates the levels of GOT, GPT, and ALP enzymes of *Chelon Labrosus* during four seasons, The assayed GOT and GPT levels were markedly increased during autumn comparing with winter while ALP level almost remained stable.

Table 1: Effect of seasonal variation on (GOT, GPT and ALP of *Chelon Labrosus*)

	Parameters	Summer	Autumn	Winter	Spring
Liver functions	GOT	130.20 \pm 21.43 ^a	229.75 \pm 40.33 ^b	90.60 \pm 4.99 ^a	101.50 \pm 2.50 ^a
	GPT	13.60 \pm 0.93 ^{ab}	23.25 \pm 2.66 ^c	18.60 \pm 1.21 ^{bc}	12.00 \pm 1.00 ^a
	ALP	86.00 \pm 5.37 ^a	89.50 \pm 4.48 ^a	83.80 \pm 2.37 ^a	95.00 \pm 6.00 ^a

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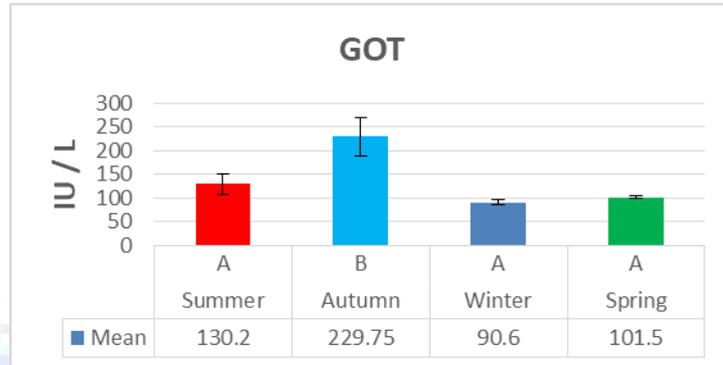


Fig.4 Effect of seasonal variation on (GOT Level) of *Chelon Labrosus*

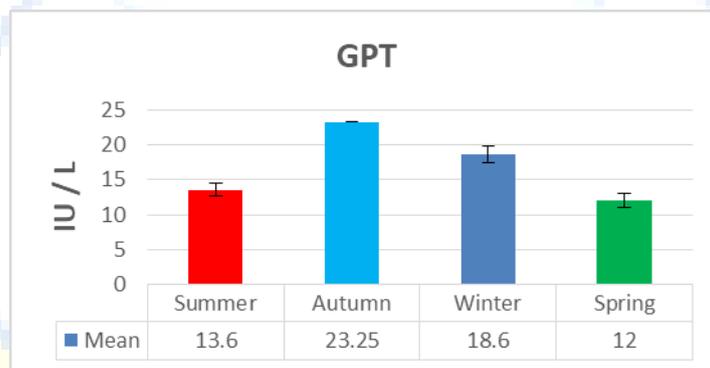


Fig.5 Effect of seasonal variation on (GPT Level) of *Chelon Labrosus*

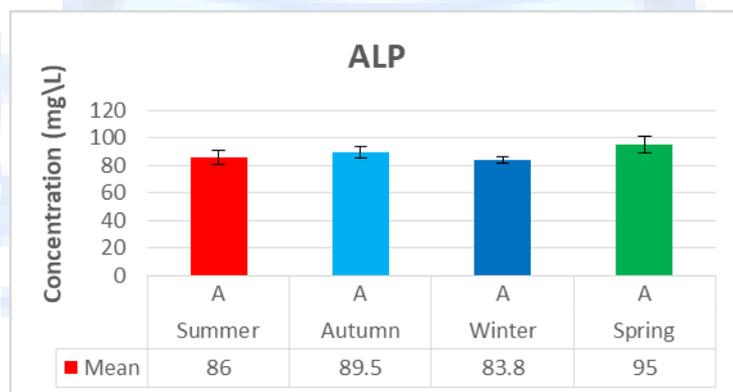


Fig.6 Effect of seasonal variation on (ALP Level) of *Chelon Labrosus*

Discussion:

There is no more information about ecology and physiology of *Chelon Labrosus* in Libya, but in this study we try to know about the relationship between seasonal variation and GOT, GPT, and ALP enzymes of *Chelon Labrosus* (Risso,1826) during four seasons in Umm Hufayn Eastern of Libya. In this study, were observed an increase in the activity of liver functions during the autumn season of *Chelon Labrosus*. often, in these two seasons, spring and autumn temperatures are moderate, Most of the seaweeds, phytoplankton, and zooplankton abound. All physiological parts of fish are active and begin the mating and breeding season, due to gonads maturation, the primary response to an increase in the secretion of adrenaline and cortisol.

Olaoluwa et al. [7] mentioned that, Fish live in very intimate contact with their environment, and are therefore very susceptible to physical and chemical changes which may be reflected in their blood components.

Bhat, Ashiq Hussain, [8] in his study on 'Schizothorax niger found that effects of the independent variables e.g., sex, weight, and length values were determined seasonally. The analysis revealed that the highest number of leukocytes was found in spring and the lowest number was found in winter. Hemoglobin and Hematocrit values were highest during the months of summer and lowest during winter. It was also seen that Males were having greater values for hemoglobin and Hematocrit than females, whereas total leukocyte count in females was higher than males. It was also found that there was a positive correlation between Length/weight and Hemoglobin and Hematocrit values whereas a negative correlation between length or weight and Total leukocyte counts.

The present study agrees with Forghaly et al. [9]. Which indicated an increase in the rate of ALP activity in the autumn season compared to other seasons, as well as with a study conducted on species of the Cyprinids family. This variation in the rate of enzyme activity is due to the influence of the season, as well as the influence of temperature changes.

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Our results came similar finding of [10], was studied the effect of seasonal change on the effectiveness of some blue tuna liver enzymes, Misurata - Libya, was observed that there is a significant increase in liver enzymes in the autumn season compared to the other seasons.

Finally, can conclude that the seasonal changes in climate directly affect some physiological parameters of animals, such as fish, although there are no more studies, this is study was agreed with most of the recent previous studies.



References

- [1] Abdalhafid, Yousef K. A., Aboubakr, Salma M., Kateesh, Mousa M.Y. and Ali, Sayed M.(2020). Evaluation of the Heavy Metals Pb, Cd, and Fe in Muscles, Liver, and Skin of Mugil cephalus (Mugilidae) from Tubrukharbor, Eastern Libya, Egypt. Acad. J. Biolog. Sci., 12(2):71-77.
- [2] El-Badry, D. A. (2010). Studies on some diseases in catfish (*Clarias garirpinus*) in Dakahlia Governorate. M. Sc. Thesis, Faculty of Science, Mansoura University, Egypt.
- [3] Mashaly, M. I. (2011). Comparative studies on monogenean parasites infesting some cichlid fishes in Manzala and Borollus Lakes in Egypt. M. Sc. Thesis, Faculty of Science, Mansoura University, Egypt .
- [4] Abdalhafid, Yousef K. A.(2013). Physiochemical and histological study on the effect of the hibernation on the liver of *Uromastyxac anthinura* (Bell, 1825).Al-Mukhtar Journal , Libya 2:5-8.
- [5] Abdalhamid, A. H. A., Ramadan, A. S. Ali, Abdalla N. Elawad and Esam M. K. Rafi. (2017). Some Ecological and Biological Studies on the European eel *Anguilla anguilla* (Linnaeus, 1758) in Umm Hufayan brackish lagoon, eastern Libyan Coast, Mediterranean Sea. Under publication.
- [6] Hrubec ,T.C., Robertson , J .Land Smith , S.A. (1997). Effects of temperature on hematologic and serum biochemical profiles of hybrid striped bass (*Morone chryscope* ×*Morone Saxatitlis*) .J.J.Vet.Res.58(2):126-130.
- [7] Olaoluwa, T. A., Odutola, O., Olugbenga, O., A., Funmilayo, D. O., Sundry, O. O. and Afolayan, A. J. (2015): Alkaline phosphatase (ALP), Aspartate aminotransferase (AST) and alanine minotransferase (ALT) activities in selected tissues of Rats fed on processed Atlantic horse merckerel (*Trachurus trachurus*). Journal of Advanced in bioscience and biotechnology, Vol. 6: 139-152.

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[8] Bhat, Ashiq Hussain,(2017). Study of possible seasonal effects on blood parameters of a local fish 'Schizothorax niger' in Kashmir valley International Journal of Zoology Studies Volume 2; Issue 6; November 2017; Page No. 90-92.

[9] Forghaly, A.M., Ezzat, A.A. and Shabana, M.B. (1973). Effect of temperature and salinity changes on the blood characteristics of Tilapia zilli in Egyptian littoral lakes. Comp Biochem. Physiol. 46a: 183-193.

[10] Aboubous, Adel Omar, Al-Hamali, Ismail Muhammad, Shagala, Laila Muhammad, Al-Ghawil, Halima Muhammad (2017): The effect of seasonal change on the effectiveness of some blue tuna liver enzymes, Misurata - Libya, the first annual conference on the theories and applications of basic and biological sciences, Faculty of Science, University of Misurata, Issue 1, 1-9