ISSN: 2277-9655
Impact Factor: 3.785

IJESRT

INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & RESEARCH TECHNOLOGY

BLOOD PHYSIOLOGICAL CHANGES OF COMMON CARP *CYPRINUS CARPIO* IN SUMMER AND WINTER SEASON IN THE CITY OF BAGHDAD-IRAQ

Suhad Y. Jassim

Research Center& Natural History Museum

DOI: 10.5281/zenodo.51057

ABSTRACT

In this work was to verify the existence of the effect of temperature difference on some blood parameters of Common Carp. The results showed follows: There were no significant differences (p>0, 05) in HB and PCV rates for group 1 and group 2 and thus no correlation coefficient between them. The results indicated the presence of significant difference (P>0.05) in WBC counts of the second group (winter collection group) compared with summer collection group, and last there were no significant difference (P>0.05) in the RBC counts for two groups.

KEYWORDS: Common carp, Hematology, temperature changes.

INTRODUCTION

Fish are considered of cold-blooded animals (poikilothermic) , In other words, its body temperature changed depend on the change in the periphery temperature where they live (Fry,1971) . Therefore, the temperature of the water is the most important physical factors of water, which affect the vital activity of fish, including the growth and reproduction etc. Fish is divided into three sections according to the temperature requirements: cold – water fish, warm – water fish and midrange fish (Al- Salman, 2000) Common Carp is classified within the usual warm-water fish that is why it is located in the central and southern regions of Iraq (Al-rudainy, 2008). The optimum temperature for carp is 25 Celsius . Thermal activity speed of fish decreased with the reduction of water temperature. The continued rise in the temperature of the water would reach the thermal death point where vital activities rates fall mostly (Stickney,1997). Scientific name of Common carp is : Cyprinus carpio Linnaeus (1758)and its belongs to the carp group :-Family ; Cyprinidae (AL-Rudainy, 2008; Mahdi&Georg, 1969). The change in temperature affects the physiological functions associated with the stress response of fish which includes the release of stress hormones such cortisol. In general hematological and biochemical parameters are good indicators to assess fish health management in various environmental conditions (Cheng et al. 2004). Hematological parameters would be sign of fish physiological responses against environmental changes (Zorriehzahra et al .2010).and it is an important diagnostic tool, with laboratory procedures and reference ranges well established in both human medicine and in veterinary medicine of domestic animals (Arnold, 2009). The aim of the present study is to assess the effect of the change in temperature on some physiological parameters of common carp.

MATERIALS AND METHODS

Fish sampling:

Common carp Cyprinus caprio weighing (450- 500 g), and length(20-30 cm) were obtained from Tigris River in Baghdad city by some fishermen, it were obtained on 10 samples of carp in the summer (July-September) and another 10 in the winter (December-February) 2015 .

Blood collection:

Blood was withdrawn by means of puncturing the caudal vein, using syringes and sterilized needles (Kori-Siakpere et al, 2005), were placed amount of blood in the tube container heparin for hematological analysis. It was calculated hemoglobin using the Sahli-hellige hemoglobin method (Larsen, 1964) and Packed cell volume of the blood (PCV) (Hasser ,1960) . One drop was used for blood smear to calculate RBC and WBC count (Dacie,&Lewis ,1975)

ISSN: 2277-9655
Impact Factor: 3.785

RESULTS AND DISCUSSION

The hematological parameters results are shown No significant differences in hemoglobin concentration and packed cell volume between the two experiment groups as shown in tables 1, 2 and 3

Table (1) Means +- standard deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Hb1	7.9300	10	1.20224	.38018
	Hb2	7.7510	10	1.84003	.58187

Table (2) Paired Samples Correlations T test was not significant at the level of P>0.05

	N	Correlation	Sig.
Pair 1 Hb1 & Hb2	10	.316	.374

Table (3) Paired Samples Test

	Paired Differences					T	df	Sig.(2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Hb1 - Hb2	.17900	1.85295	.58595	-1.14652-	1.50452	.305	9	.767

Means of hemoglobin range in fish group collected in the summer: 7.93, while it was 6.75 in winter group table (1). And means of PCV rate: 32.8 for first group and 30.8 for second group table (4). There were no significant differences (p>0,05) for two parameters , This corresponds with the results obtained by **(Abalaka, 2013)**.
This concluded that there was no significant relationship between temperatures and (Hb, PCV) concentrations.
As previously mentioned, Fish temperatures change with the environment where it live. **(Al-Salman, 2000),** So it considered of the animals that adapted with the changes in temperature **(Peteri,1992)** this can be a logical explanation.

Table (4) Means +- standard deviation
Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pcv1	32.7990	10	3.60785	1.14090
	pcv2	30.7520	10	4.09689	1.29555

Table (5) Paired Samples Correlations P>0.05 / T test was not significant at the level of

		N	Correlation	Sig.
Pair 1	pcv1 & pcv2	10	-.248-	.489

Table (6) Paired Samples Test

		Paired Differences					t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	pcv1-pcv2	.04700	6.09481	1.92735	-2.31296-	6.40696	.062	.316

Tables (7, 8, 9) show significantly (P>0.05) higher of WBC counts in the second group compared with first group , and This confirms the existence of a significant relationship between Fish temperatures and the number of white blood cells ,this results In line with what it says each of the **(Abalaka , 2013).** This could be due to the presence of Stress because of temperatures decreasing **(Wedemeyer, 1977).**

Table (7) Means_+ standard deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	wbc1	5880.0000	10	1751.06317	553.73479
	wbc2	7750.0000	10	2383.39161	753.69460

Table (8) Paired Samples Correlations T test was significant at P>0.05

		N	Correlation	Sig.
Pair 1	wbc1 & wbc2	10	.801	.005

Table (9) Paired Samples Test

		Paired Differences					T	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	wbc1 - wbc2	-1870.00000-	1434.53438	453.63960	-2896.20408-	-843.79592-	-4.122-	9	.003

ISSN: 2277-9655
Impact Factor: 3.785

Results in table (10) illustrate means and standard deviations of RBC count . It was: 4.9180 and 5.4070 group 1, group 2, respectively.

Table (10) Means_ + standard deviation

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Rbc1	4.9180	10	.89085	.28171
	Rbc2	5.4070	10	.88377	.27947

There were no significant difference at P>0.05 in the total count of red blood cell in group 1 and 2.and between them (Table 11 ,12). This is evidence of the thermal adaptation of fish **(Wedemeyer & Yasutake, 1977).**

Table (11) T test was not significant at P>0.05 Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Rbc1 & Rbc2	10	.267	.455

Table (12)Paired Samples Test

	Paired Differences					T	Df	Sig.(2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Rbc1 - Rbc2	-.48900-	1.07411	.33966	-1.25737-	.27937	-1.440-	9	.184

CONCLUSION

From the present study it can be concluded that the change in temperature of fish, especially freshwater fish does not affect a significant impact on hematology parameters In other words, there is the effect but not significant, maybe because of the thermal adaptations of fish, or moderation of Iraqi weather, etc.

ACKNOWLEDGEMENTS

This study was supported by Research Center and the Museum of Natural History/ Baghdad University .Thanks to Dr. Ezeddin Albayyar, Faculty of Science / University of Anbar to help him to complete statistical analysis of search results.

REFERENCES

[1] Abalaka S.E. (2013). Evaluation of the hematology and biochemistry of Clarias gariepinus as biomarkers of environmental pollution in Tiga dam Nigeria J. D. Poston and W. D. Horne, "Discontiguous OFDM considerations for dynamic spectrum access in idel TV channels," in Proc. IEEE DySPAN, 2005.
[2] AL-Khashaly, M, S. (2009). Be a successful educator Fish National printing press, Booklet practical.
[3] AL-Rudainy, A.J. (2008). Atlas of Iraq fresh water fishes, Republic of Iraq / Ministry of Environment.
[4] AL-Salman, M.H. (2000). Basics of breeding and fish production (book) Second(ed)., Ministry of higher education and scientific research/ University of Mousle.
[5] Arnold J. E. (2009). Hematology of fish: WBC and RBC cell morphology, published in IVIS with the permission of the ACVP/ASVCP.
[6] Cheng C.Y. ,Wooster G.A.Bowser P.R.(2004). Comparetive blood chemistry and histopathology of tilapia infected with Vibrio vulnificus or Streptococcus iniae or exposed to carbon tetra chloride .gentamicin of copper sulfate aquaculture .239.421-443.
[7] Dacie JV, Lewis SM ,(1975). Practical hematology , 5th edn Churvhill Livingstone ,London.

[8] Fry,F.E.J.(1947). The effect of environment on animal activity. University of Toronto, studies biology series 55 publication of the ontorio fisheries research laboratory, 68:1-62.
[9] Hasser E F.(1960). Methods for routine fish hematology. Prog Fish Cult. 22:104-171.
[10] Kori-Siakpere O,AkeJeg,Idoge E. Hematological characteristics of the African snakehead,Parachanna obscura .Afri J Biotechnol.4(6):527-530.
[11] Larsen,H.W. (1964). Comparition of various methods of hemoglobin determination of Catfish Ictalurus punctatus . Trans Am.Fish.Soc. 103:593-600.
[12] Mahdi,N. &Georg ,P.V.(1996). Asystematic list of the vertebrates of Iraq ,publication No. 26,University of Baghdad ,Iraq Natura History Museu.
[13] Peteri A,Nandi S, Chowdhury SN.Manual on seed production of African magur (Clarias gariepinus). FAO document, repository, BGD/87/045/92/22.Rome, Italy: FAO.
[14] Stickney,R.R.(1997). Principles of warm water aquaculture. Wiley –, London, 375pp.
[15] Wedemeyer , G.A. and W.T. Yasutake. (1977). Clinical methodsfor the assessment of the effects of environmental stress on fish health .Tech.Pap.89.U.S.Dep.Int.Fish and Wild1.Serv.Washington,D.C.
[16] Zorriehzahra M.J;Hassan M.D.;Gholizadeh M. and Saidi A.A.(2010).Study of some hematological and biochemical parameters of Rainbow trout (Oncorhynchus mykiss) fry in western part of Mazandaran province, Iran ,Iranian J.of fisheries sciences 9(1) 185-198.

AUTHOR BIBLIOGRAPHY

SUHAD YASIN JASSIM Date of Birth : 16 /6/ 1975 Baghdad ,Iraq.Specialization:Master of science Work address:Reseach senter & natural history museum, biology-physiology
Position now: teaching staff (Instructor)