http://doi.org/10.26692/sujo/2019.03.88

SINDH UNIVERSITY RESEARCH JOURNAL (SCIENCE SERIES)

Effect of Seasonal Variations of Fresh Water crabs of Shaker loy(Siyap) Stream of District Nushki Balochistan Pakistan

S.B. SOOMRO, G. DASTAGIR

Department of Zoology, University of Balochistan, Quetta

Received 13th March 2019 and Revised 12th July 2019

Abstract: The present study was design to assess the freshwater crabs and physico –chemical parameters of shakerloy (Siyap) stream district Nushki Balochistan Pakistan. Collection of water and crab samples was started from March 2017 to February 2018. In case of crabs total five species of fresh water crabs *Potamonibericum, Potamonfluviatile, Potamongedrosianum, Pyxidognathusfluviatilis* and *Austrotelphusatransversa* were found as dominant species of Shaker loy stream. The water quality parameters like temperature, turbidity, pH, dissolved oxygen, salinity, total dissolved solids, conductivity and biological oxygen demands were enumerated and noticed within the suitable ranges and no significant variation was recorded. Finally concluded that water of Shaker loystream found to be suitable for drinking, irrigation and fisheries management purpose.

Keywords: Crabs, Temperature, Shaker loy, Stream, Balochistan

1. INTRODUCTION

Freshwater crabs are found in all the steamy and sub-tropical areas of the biosphere. They can survive in all type of water bodies (Sakhare 2014).Brachyurans are known as true crab having 6500 species and it is the largest category of decapods Crustacean (Ahyong, *et al.*, 2007). Recently there are 6.700 known species of brachyuran crabs including marine water and Freshwater, in which true fresh water crabs are of 1,300 species Brachyurans adopted freshwater both semi-terrestrial and terrestrial forms of life. Some freshwater crab's habitat is caves (Balian 2008). About 5000 species of crabs belonging to 700 genera identified worldwide (Shukla *et al.*, 2013). Crustaceans such as crabs are healthy food for humans with high quality protein and less amount of fat. (Kamble 2014). The quality of water has great influence on population of aquatic organisms (Adeyemo *et al.*, 2008). The layout and the geography of a particular area also effect on the quality of water. Anthropogenic actions, like weathering, erosion, geological characteristics of the environment, geochemical and ever growing population of the globe have kept fluctuations in natural water bodies (Adefemi and Awokunmi, 2010). In result, biological, chemical and physical parameters effect on water quality. hence regular monitoring of physicochemical parameters is essential (Arain *et al.*, 2008). Important physical and chemical parameters that affect the natural water quality are temperature, pH, Turbidity, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), alkalinity, nutrients (Nitrate-N, Phosphate-P), (Lawson, 2011; Nduka *et al.*, 2008). These parameters are limiting factors for the survival of aquatic organisms (flora and fauna) (Lawson, 2011).

2. MATERIALS AND METHODS

(1) Sampling area:

Sampling has been done once in a month during March 2017 to February 2018.Water samples were collected near the surface of the stream and depth about 10-15 inches of same area and kept in jerry cans. Sampling was estimated during 10 A.M to 12 P.M. At sampling area temperature was measured by using mercury thermometer. Sacchi disc was used to measure transparency of water sample. Turbidity meter was used to measure turbidity of water. pH of water sample was observed on the spot in the field by using portable pH meter and pH paper. Dissolve oxygen with the help of DO2 meter. Salinity, TDS (total dissolved oxygen) and conductivity was measured by using conductivity meter.

(2) Collection, preservation and identification of crabs:

Initially fresh water Crabs were collected with the help of net from experimental area. Crabs were preserved in 4% alcohol. There after the specimens were preserved in 5% Formalin and then transferred to department of zoology (fisheries lab) for identification. The identification of fresh water crab was done by using keys Shafi and Qaddus (1982) and Siddique and Zahoor (2002).

3. RESULTS AND DISCUSSION

The water samples were analyzed for physico-chemical characteristics of shakerloy (Siyap) stream and

the results are given in **(Table. 1 and Fig. 1).** Aneffort was completed in the study to measure the water quality variations at every month from March 2017 to February 2018.Water temperature is an essential parameter which effects on biochemical relationship in the organisms of water (Trivedi and Goel, 1986). The average water temperature was recorded in the present study was 15.96±10.4℃. The fluctuation in higher and lower water temperature effects the metabolic activities, development, reproduction and migratory behavior of crustaceans. In the present study the maximum temperature of shaker loy (siyap) stream Nushkibalochistan Pakistanis 32℃.The similar work was done by (Roy *et al.*,2010) that the pond temperature was lowest in November while the highest was recorded in May.

Table.1.Month wise variations of physical and chemical parameters. Water shaker loy (siyap) stream during March2017 to March 2018

Month	Temp ℃	Color of water	Turbidity	pH	DO2 mg/L	DO2 Saturation %	Salinity g/L	TDS mg/L	Conductivity µS	BOD mg/L
March	7°C	Clear	45	7.6	4.2	40%	0.4	442	246	4.4
April	13°C	Clear	22	7.3	6.2	62%	0.2	480	233	6.3
May	19°C	Slightly turbid	30	7.4	7.1	53%	0.1	506	239	5.1
June	25°C	Slightly turbid	38	7.2	6.5	41%	0.4	551	236	4.2
July	32°C	Clear	18	7.0	7.8	53%	0.3	490	240	4.6
Aug	30°C	Clear	33	7.3	5.4	43%	0.4	477	248	4.3
Sep	26.2°C	Clear	42	8.0	6.1	35%	0.4	421	242	2.8
Oct	20.3°C	Clear	58	7.0	5.2	46%	0.1	380	245	3.5
Nov	16°C	Slightly turbid	45	7.4	6.2	70%	0.1	332	248	6.6
Dec	10°C	Clear	50	7.1	5.4	52%	0.4	311	248	5.5
Jan	5°C	Clear	52	7.0	5.6	48%	0.2	275	246	4.4
Feb	3°C	Clear	49	8.1	5.2	38%	0.1	251	245	3.5
March	1°C	Clear	45	7.2	5.1	60%	0.4	231	242	5.7

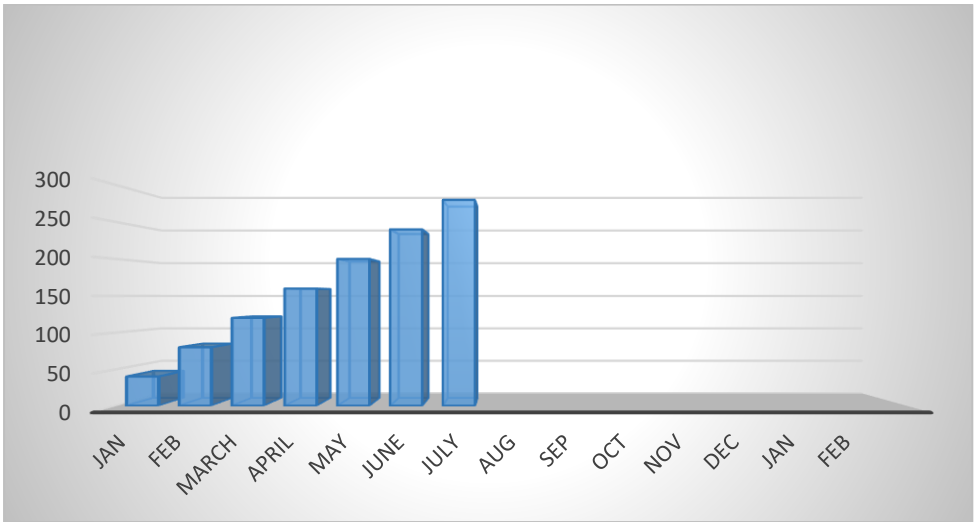

Fig.1 Seasonal variation of physical and chemical water quality parameters of shaker loy (siyap) stream during March 2017 to Feb 2018

The turbidity of water is mainly caused by suspended particles like clay, slits, organic nutrients, zooplanktons, phytoplanktons and sand particles. According to present study the average value of turbidity was 40.53±11.85 cm. The experimental value of turbidity of shaker loy (siyap) stream Nushki Balochistan Pakistan is 52-18 NTU. (Lashari *et al.,* 2009) noted smallest turbidity in December 30 NTU and highest in May 78 NTU by carrying the limnological study of Keenjhar lake district Thattha Sindh.

pH is a parameter which defines the appropriateness of water for various purposes. In present study of pH the average value was 7.35±0.35.which is within drinking water as per (7). The pH of water effects many biochemical process in water. pH levels fluctuate due to photosynthesis and respiration in the water. The change in value depends on the alkalinity of the water. The average pH of shaker loy (siyap) stream Nushkibalochistan Pakistan during survey was 7.0 to 8.1 respectively. The same work was done by (Khare *et al.,* 2013). Water quality status of Benisagar dam Chhatarpur District (M.P),India.

Dissolve oxygen is a vital parameter which is important for aquatic organisms. Aquatic organisms need dissolved oxygen to respire. In the recent study the dissolve oxygen average value was 5.84±0.94mg/L. The experimental value of shaker loy (siyap) stream Nushkibalochistan Pakistan positively relates with various variables, one of them is COD. The value of DO2 of shaker loy (siyap) stream is adversely linked with temperature .Similarly result was found by (Huet and Rimmermans 1986).

Salinity stands for the amount of the salts dissolved in water. In recent study the observed average value was 0.26±0.13g/L. The mean value of salinity of shaker loy (siyap) stream Nushki Balochistan Pakistan was 0.1-0.4 (Soomro *el al.,* 2014) evaluated salinity of four lakes Deh-Akro II (Kundho 6.5, Dhandho 9.5, Drigh 11.5 and Yariwari 11.5).

Total dissolve solids include inorganic salts and small quantities of organic matter that are dissolved in water. Dissolve solids are good for drinkable water. Water possibility depend upon the total dissolve solids. The mean value of total dissolve solids was 395.92±106.37mg/L. The maximum value of shaker loy (siyap) stream Nushkibalochistan Pakistan is 551Mg/L. The same work was done by (Namdeo *et al,* 2013) reported low TDS in post monsoon and the value of TDS was highest in pre monsoon period.

The conductivity of water is the ability to transmit heat or ions present in water. It describes the nutrient status of water. The average value conductivity was 242.92±4. 80µS.The seasonal difference of conductivity may be due to deficient inflows of fresh water, release of slits and salts from nearby and some of domestic effluents. Electric conductivity water of shaker loy (siyap) stream highest range was 248µS. (Zubia *el at.,*2015) pointed out the conductivity of streams of Kamanger and Kotal water is good for pesiculture but conductivity of Dhoda and Toi does not favour fish propogation. The water of shaker loy (siyap) stream showed the lowest electric conductivity 233µS.During the evaluating period of March 2017 to February 2018 biological oxygen demand (BOD) range was 4.68±1.120 mg/L. The current investigation on shaker loy (siyap) stream the value of biological oxygen demand was recorded 6.3 in April. The same work was done by (Namdeo *et al.,*2013) observed that the value of biological oxygen demand of Barna reservoir is lesser than D.O revealing less amount oxygen is needed by microorganisms for biodegradation of organic material similar interaction is seen in current study. **(Table.1).**

The present study was show total five species of crabs from shaker loy (siyap) stream district Nushki Balochistan Pakistan. The present investigation of two species of fresh water crabs Potamonibericum and Potamonfluviatile belongs to family Potamidae were fresh water crabs of shaker loy (siyap) stream. With our collection the distribution of Potamonibericum and Potamonfluviatile are much dominant species through out study period. The same work was done by (Eugene *et al.,* 2004) in lotic stream factors in Greece.

The collection of *Potamongedrosianum*belong to family Potamidae From shake loy (siyap) stream. The same work was done by (Aliezakeikhosravi *et al.,*2016).

In our collection another species of fresh water crab Pyxidognathusfluviatilis belong to family Grapsidae from shaker loy (siyap) stream . the same work was done by (Hassan *et al*,2016).The greatest percentage of fresh water crab Austrotelphusatransversa belong to family Parathelphusidae was observed during study period of shaker loy (siyap) stream the same work was done by (Nathan Waltham 2016)in tropical river catchment Nothern Australia. Theresults are given in **(Table.2).**

Table. 2 Crab diversity of shaker loy (siyap)stream .

Family	Species	Place of occurrence
Potamidae	Potamonibericum Potamonfluviatile *Potamongedrosianum*	Shaker loy (siyap) stream Nushki Balochistan Pakistan
Grapsidae	PyxidognathusFluviatilis	
Parathelphusidae	Austrotelphusatransversa	

4. CONCLUSION

It was concluded that no significant variation was observed only few essential nutrients are present which indicates abundantly primary producers, which turn to the favorable for fish growth. Finally it was concluded that hakerloy (siyap) stream water is suitable for drinking, irrigation and fisheries management.

REFERENCES:

Ahyong S., J. Lai D. Sharkey and D. Colgan, (2007) Molecular Phylogenetics and Evolution, 576-586.

Alireza K., R. Naderloo and D. Christoph (2016) Schubart[3]Crustaceana, Vol. 89, Issue 2,129–139 : DOI: 10.1163/15685403-00003512ISSN: 0011-216x E-ISSN: 1568-5403.

Boyd, C.E. (1982) .Water quality management for pond fish culture. Elsevier Science Publishing Company, New York.

Balian, E. (2008) Freshwater Animal Diversity Assessment. Dordrecht, Netherlands: Springer.

Basavaraja, S. S., M. Hiremath, K. N. S. Murthy, K. N. Patel, E.T. Puttiah, (2011) Analysis of Water Quality Using Physico-Chemical Parameters Hosahalli Tank in Shimoga District, Karnataka, India, Global Journal of Science Frontier, Research, 1(3), 31-34

Gupta, D., P. Sunita and J. P. Saharan (2009), Physio-chemical Analysis of Ground Water of Selected Area of Kaithal City (Haryana) India, Researcher, 1(2), 1-5.

Huet, M. and J. A. Timmermans (1986). *Textbook of fish culture. Breeding and cultivation of fish* (No. Ed. 2). Fishing News Books Ltd.

Hasan R. and H.O. Rashid (2016) A Study and Availability Assessment of Freshwater Crabs in the Hill Streams of Bangladesh. Int J Aquac Fish Sci. 2(1): 018-022. DOI: 10.17352/2455-8400.000014

Khare, H. N. and S. K. Shukla, (2013).Water Quality Status of Benisagar Dam Chhatarpur District (M.P.), India. International Journal of Innovative Research in Science, Engineering and Technology,*2*(11).

Lashari, K. H., G. A. Sahato, and T. G. Kazi, (2009). Limnological studies of keenjhar lake, district, Thatta, Sindh, Pakistan. Pakistan Journal of Analytical and Environmental Chemistry, 10(1-2), 39-47.

Maurakis, E. G., D. V. Grimes, and P. J. Hogarth, (2004) Occurrence of Potamon species (Decapoda, Brachyura) relative to lotic stream factors in Greece. Biologia, Bratislava, 59: 173—179, ISSN 0006-3088.

Misra, S. G., and D. Dinesh, (1991), Soil Pollution, Ashing Publishing House, New Delhi,

Namdeo, A. K., P. Shrivastava, and S. Sinha, (2013). Seasonally Varying Limnology of a Tropical Irrigation Reservoir: Barna Reservoir. Journal of Chemical, Biological and Physical Sci. (JCBPS), 3(3), 2309Pp.

Premlata, V., (2009), Multivariant analysis of drinking water quality parameters of Lake Pichhola in Udaipur, India. Biological Forum, Biological Forum- An International Journal, 1(2), 97-102.

Prasad, B. G., and T. S. Narayana (2004). Subsurface water quality of different sampling stations with some selected parameters at Machilipatnam town. Nat. Env. Pollut. Tech., 3(1): 47-50.

Roy, U. Z. Z. A. L., B. K. Shaha, K. Mazhabuddin, M. F. Haque, and M. G. Sarower, (2010). Study on the diversity and seasonal variation of zooplankton in a brood pond, Bangladesh. *Marine Res Aqua*, *1*(1), 30-37.

Singh, P. K., N. P. Srivastava and V. R. Desai, (1980) J. Inl. Fish Soc. India 12, 100Pp.

Shukla M. L., B. K. Patel, J. N. Trivedi, and D. Vachhrajani, (2013) Research Journal of Marine Sciences, 1(2):8-11.

Sakhare S., and N. A. Kamble (2014) Universal Journal of Environmental Research and Technology, 4(2): 155-164.

Soomro, A. N., S. A. Balouch, T. M. Jahangir, W. A. Baloch, K. H. Lashari, W. M. Achakzai, and T. J. Ursani. (2014). Fish, Plankton Biodiversity and Physico-Chemical Parameters of Five Lakes of Deh-Akro II. S. U. Res. Jour. (Sci. Ser.) Vol.46 (2): 111-116

Trivedi, R. K. and P. K. Goel, (1986). Chemical and biological methods for water pollution studies, Environmental Publications, Kard (India). Ress Company, N. Y. Smith, G.M Ronald, Press New York.

VanLeeuwen; F. X. R. (2000) Food and Chemical Toxicology, 38, 51-58.

Warren, C. E. (1971) Biology and water pollution control. W. B. SAUNDERS Co., 322–348.

Wilhm, J. L., (1975) Biological indicators of pollution. In: Whitton, B. A. (ed.) River Ecology. Blackwell Scientific Publications,Oxford.725Pp.

Waltham, N. (2016) Unravelling life history of the Inland Freshwater Crab Austrothelphusatransversa in seasonal tropical river catchments. Australian Zoologist, 38 (2). 217-222.