

Biochemical changes of freshwater fish *Mystus seenghala* infected with cestode parasites

Dipti B Kadu

Department of Zoology, Arts and Science College, Affiliated to Rashtrasant Tukadoji Maharaj Nagpur University, Pulgaon, Wardha, Maharashtra, India

Abstract

In present study aimed determining biochemical changes that may occur from parasitic infection in fresh water fishes *Mystus seenghala* where fishes examined for parasites for biochemical contents (Protein, Glycogen and Lipids) in muscles (mg/gm of tissue) infected and non-infected of *Mystus seenghala* with cestode parasites found that 19.28, 20.18, 18.12 Protein (mg/g of dry weight of tissue in infected and in non-infected 21.78, 22.09, 20.21 in observation periods and Glycogen mg/100 ml of solution 24.70, 25.16, 22.89 in infected and in non-non infected 28.12, 29.23, 26.45 respectively. Also, Lipids mg/gms in infected 11.23, 12.15, and 10.14 and in non-infected 12.90, 13.20 and 11.05 in examined time periods respectively.

Keywords: *Mystus seenghala*, protein, glycogen and lipids

Introduction

Mystus seenghala is a senior synonym of *Sperata seenghala* (Sykes, 1839 May) belonging to family Bagridae, Genus- *Sperata* and Species- *Sperata seenghala*, distribute throughout Asian countries, India, Nepal, Bangladesh, Afghanistan, Pakistan, China and Thailand (Menon A.G.K., 1999, [4] Shrestha J, 1994, [5] Rahman A.K.A., 1989, [2]. Talwar P.K. and Jhingran A.G., 1991, [1] Mirza M.R. and Omer T, 1984, [6] Jayaram K.C, 2006, [3] Monkolprasit S. *et al*, 1997, [7] and Saini A. *et al*, 2010). *S. seenghala* is an important food fish because rich source of nutrition, Bimal Prasanna Mohanty *et al*, 2012 has been estimated the crude protein, crude fat and ash contents to be 20.06 ± 1.13 , 1.40 ± 0.79 and $0.90 \pm 0.08\%$, respectively. Protein content of *S. seenghala* is higher than that of many other catfishes, in *Mystus vittatus* protein content is $15.62 \pm 0.32\%$, *Clarius batrachus* $14.78 \pm 0.63\%$, *W. attu* $17.00 \pm 0.12\%$ and is similar to bagridae catfish *Sperata aor* $19.05 \pm 0.28\%$ (Kamal D. *et al*, 2007 [10] and Memon N.N, *et al*, 2010) [9].

Production as well as productivity freshwater fish which are taken for investigation fishes are infected with various parasites than other fish diseases and these parasites multiply within host fish due to this ultimately fish quality and production also their demands are decreases in market even though this fish demand in market high due the nutritional properties as well as less amount of spines in fishes so it is easily serve in diet. Fish parasites interfere with their nutrition and also disrupt metabolism and their secretary function of alimentary canal and damage their nervous system due to damage nervous system of fishes there is protein play important role in maintaining of

damaged tissue but parasites also consumed protein, glycogen and lipid from fish tissue so, fish incapable for recover damaged tissue because of nutrition consumed by parasites for growth and development (Sandeep P. 2016). In fish farming reported the decreased protein and carbohydrate in muscle of fish and their liver when they infect by cestode parasites (Hassan A.H., 2015).

Fish infection intensity caused change in total protein content in muscle of *Channa punctatus*. So, in present studies on effect of cestode parasites on biochemical parameters like Protein, Carbohydrate (Glycogen) and Lipid.

Materials and methods

The fishes were collected from Pulgaon District, Wardha (MS). India and brought to laboratory and kept wax tray for dissection to identify whether infected or not infected with cestode parasite brought for biochemical investigation. Biochemical contents like (Protein, Glycogen and Lipids) of fishes. The fishes are dissected with help of dissection box instrument and whenever necessary dry muscle tissue infected as well as non-infected then biochemical were estimated from fresh muscles of host fish. The Protein are estimated by one pioneer scientist Lowry method Lowry *et al*. (1951), [13] Carbohydrates (glycogen) are estimated (Glycogen content) by using anthrone method Hedge *et al*. (1962) [12] and also Lipids percentage in muscle are estimated by Cox and Pearson (1962) [11, 12] method and also, Ananthi. S. *et al*, (2015), [14] and Deshmukh D. R. (2016) all biochemical parameters of fishes was estimated by this method.

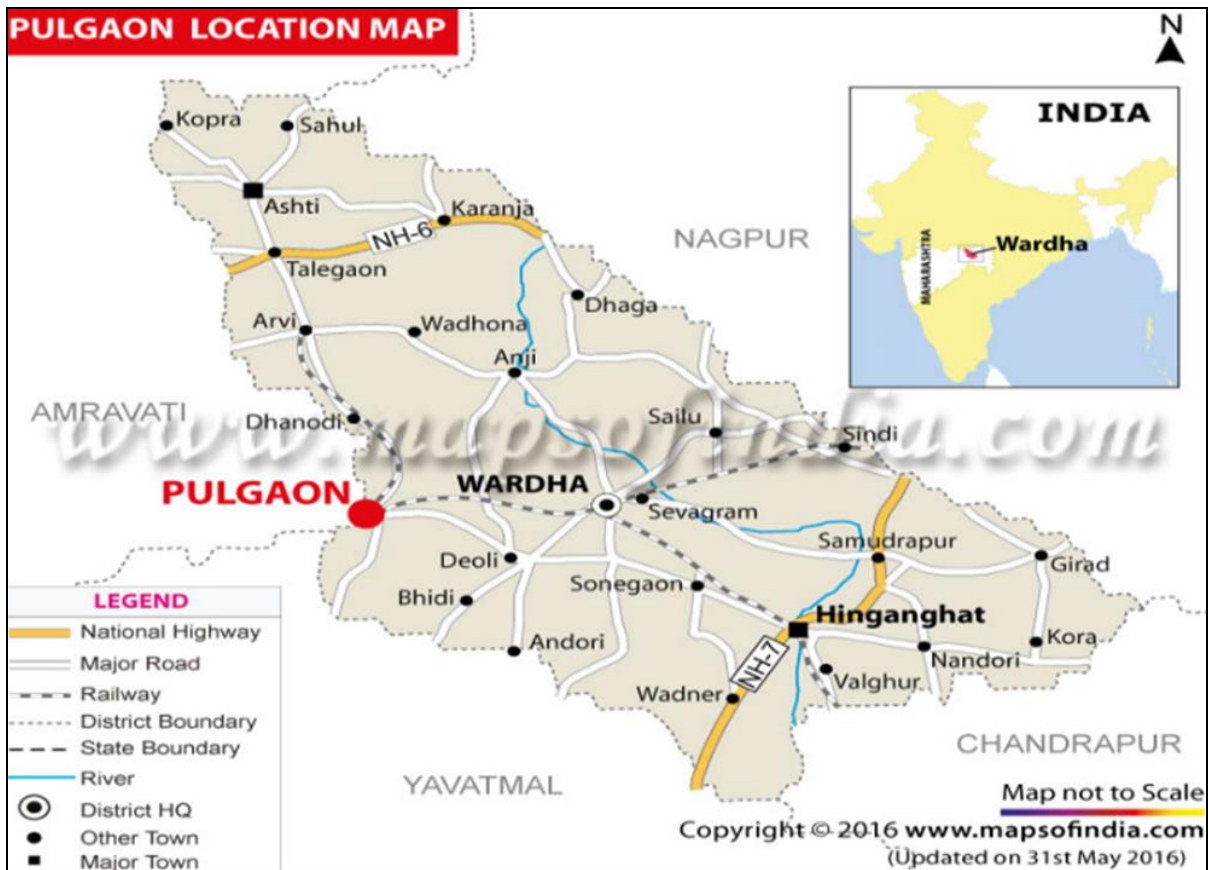


Fig 1: Maps showing fish collection site

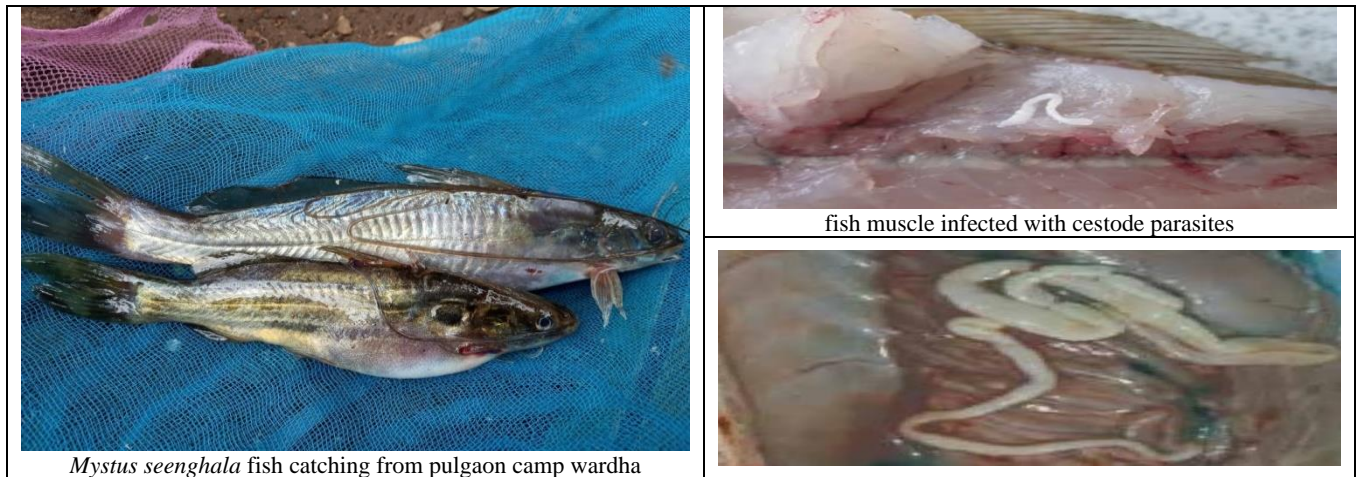


Fig 2:

Results

Biochemical contents (Protein, Glycogen and Lipids) in muscles (mg/gm of tissue) infected and non-infected of *Mystus seenghala* with cestode parasites found that 19.28, 20.18, 18.12 Protein (mg/g of dry weight of tissue in infected and in non-infected 21.78, 22.09, 20.21 in

observation periods and Glycogen mg/100 ml of solution 24.70, 25.16, 22.89 in infected and in non-infected 28.12, 29.23, 26.45 respectively. Also, Lipids mg/gms in infected 11.23, 12.15, and 10.14 and in non-infected 12.90, 13.20 and 11.05 in examined time periods respectively metioned in table no.1.

Table 1: Biochemical contents (Protein, Glycogen and Lipids) in muscles (mg/gm of tissue) infected and non-infected of *Mystus seenghala* with cestode parasites collected from Pulgaon Dam, Pulgaon District, Wardha (MS). India.

Month	Protein (mg/g of dry weight of tissue)		Glycogen mg/100 ml of solution		Lipids mg/gms	
	Infected	Non-Infected	Infected	Non-Infected	Infected	Non-Infected
March- May 2019	19.28	21.78	24.70	28.12	11.23	12.90
June-Sept 2019	20.18	22.09	25.16	29.23	12.15	13.20
Oct-Dec 2019	18.12	20.21	22.89	26.45	10.14	11.05

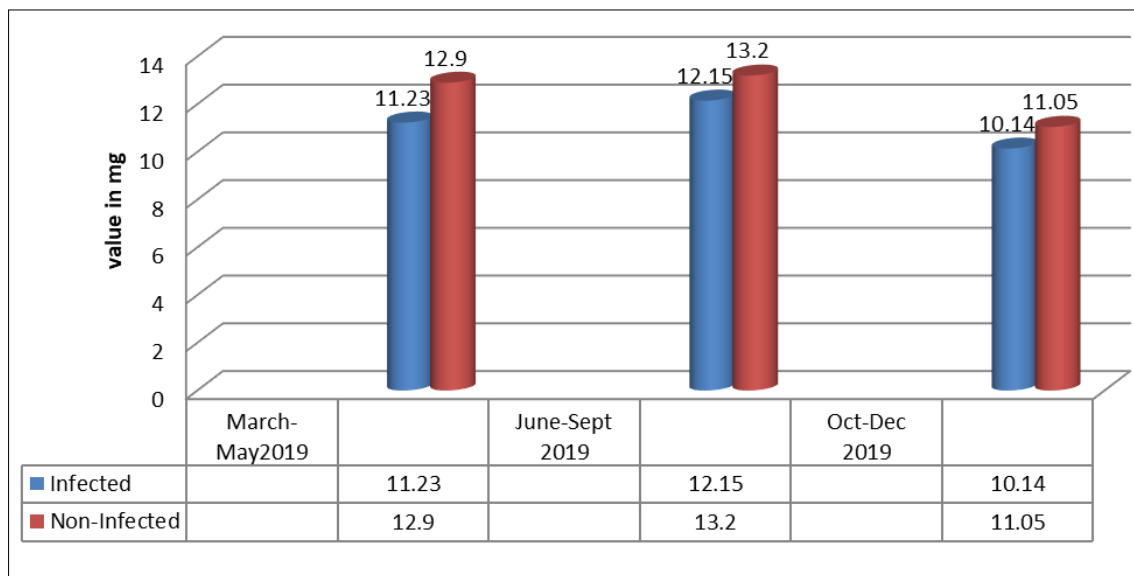


Fig 3: Lipid content in *Mystus seenghala* muscle infected and non- infected with cestode parasites mg/gms

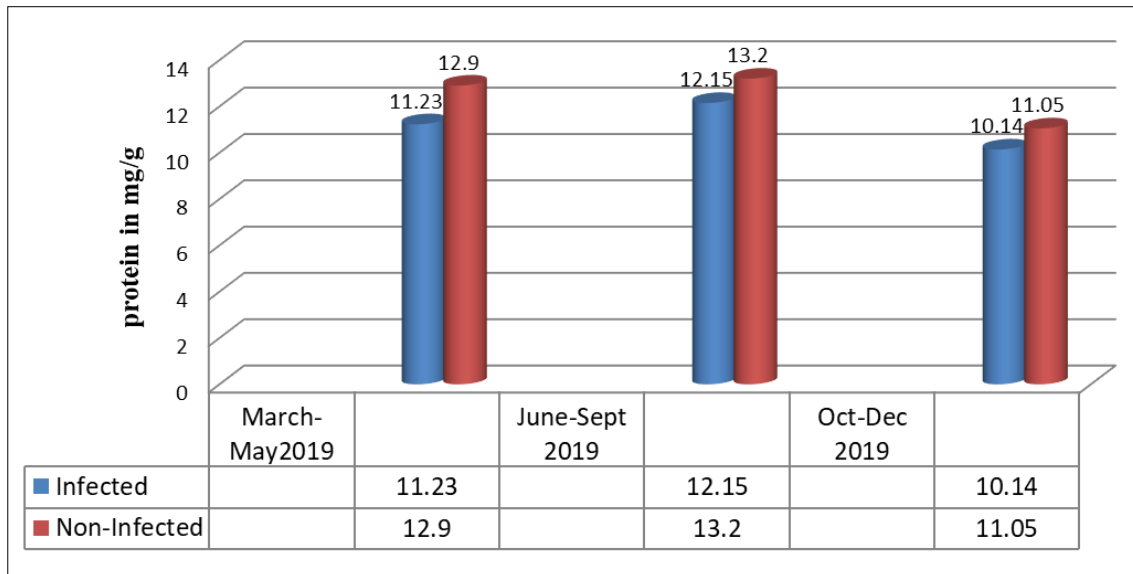


Fig 4: Protein content in *Mystus seenghala* mg/g of dry weight of tissue

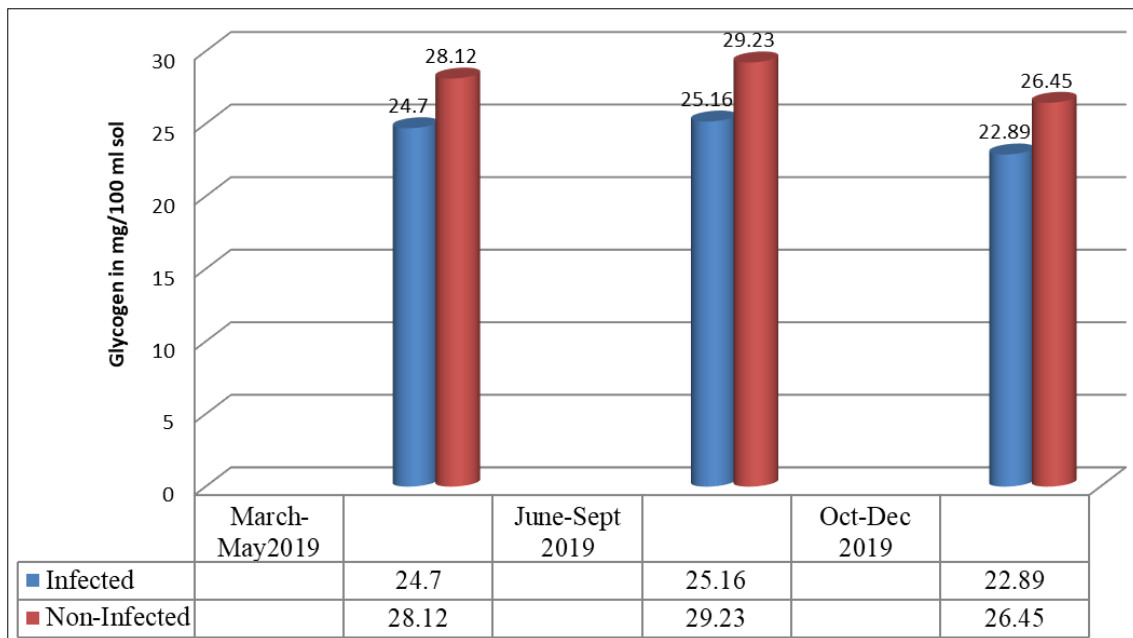


Fig 5: Glycogen mg/100 ml of solution content in *Mystus seenghala*

Discussion and Conclusion

Biochemical parameter, Protein, Glycogen and Lipids analysed results showed in infected and non-infected of *Mystus seenghala* with cestode parasites decreases in between the month of March to May Whereas muscle glycogen content of fishes shows significant increase during June to May are shown in Table 1. Present findings suggest that apparently healthy indigenous fish sold in selected markets in pulgaon market are carriers of various ecto- and endoparasites and infections are mostly sub-clinical. These parasitic infections may alter haemato-biochemical parameters, which would be of diagnostic value in naturally infected fish. Integrated control strategies are indicated to improve the health and productivity of indigenous fish. It would therefore, be recommended that fish purchased at markets for rearing or restocking be isolated and treated appropriately to avoid introduction of infection and infestation to already existing stock in the dam and market. So, *S. seenghala* is an important food fish and enjoys great consumer preference owing to its perceived superior

nutritive value. However, there is a paucity of information on the nutritional composition of this economically important species.

References

1. Talwar PK, Jhingran AG. Inland fishes of India and adjacent countries. Oxford IBH Publishing Co Pvt Ltd, New Delhi-Calcutta, 1991:1-2:1158.
2. Rahman AKA. Freshwater fishes of Bangladesh. Zoological Society of Bangladesh (ZSB), Department of Zoology, University of Dhaka, Dhaka, Bangladesh, 1989, 364.
3. Jayaram KC. Catfishes of India (Editor) Narendera Publishing House, Delhi, India, 2006.
4. Menon AGK. Check list - fresh water fishes of India. Records of the Zoological Survey of India. Occasional 1999, 175-366.
5. Shrestha J. Fishes, fishing implements and methods of Nepal. Smt. M.D. Gupta, Lalitpur Colony, Lashkar (Gwalior), India, 1994, 150.

6. Mirza MR, Omer T. A key to the identification of the freshwater fishes of Baluchistan,1984:30:73-91.
7. Monkolprasit S, Sontirat S, Vimollohakarn S, Songsirikul T. Checklist of Fishes in Thailand. Office of Environmental Policy and Planning, Bangkok, Thailand, 1997, 353.
8. Saini A, Dua A, Mohindra V. Comparative morphometrics of two populations of giant river catfish (*Mystus seenghala*) from the Indus River system. *Integr Zool*,2008:3:219-226.
9. Memon NN, Talpur FN, Bhanger MI. A comparison of proximate composition and fatty acid profile of Indus River fish species. *Int J Food Prop*,2010:13:328-337
10. Kamal D, Khan AN, Rahaman MA, Ahamed F. Biochemical composition of some small indigenous fresh water fishes from the river Mouri, Khulna, Bangladesh. *Pak J Biol Sci*,2007:10:1559-1561.
11. Cox HE, Pearson D. The chemical analysis of foods, Chemical Publishing Co. Inc. New York, 1962, 420.
12. Hedge JE, Hofreiter BT. In: Carbohydrate Chemistry, 17 (Eds. Whistler R.L. and Be Miller, J.N.), Academic Press, New York, 1962.
13. Lowry OH, Rosebrough NH, Farr AL, Randall RJ. Protein measurement with folin phenol reagent. *J. Biol. Chem*,1951:193(1):265-275.
14. Ananthi S, Subbulakshmi S, Joycy Joy manoharam. Biochemical study of selected fresh water fishes in grand anicut. *International Journal of Advanced Research*, Volume,2015:3(5):305-307.
15. Deshmukh DR, Study on biochemical composition in fresh water fish *anabas testudineus*, *mastacembelus armatus*. from paithan, district- aurangabad, maharashtra state, india. *Trend in fisheries research*, 5(1), 21-23.