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Physio-chemical parameter analysis of Borgaon Dam water correlation with cestode parasite

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Abstract
Present work were carried out on physiochemical parameter of Borgaon dam water with special references of cestode parasites and results showed that the physiochemical parameter of water and their quality positives correlation with fish parasites prevalence, abundance and intensity. In this work water sample collected in sterile bottle by previously described method and physiochemical parameter analyzed. Cesode parasites_*Circumonchobothria sp*, *Gangesia sp*. and *Senga sp.* found in host *Shingala and Wallago attu* and their prevalence mentioned in table 1. at physiochemical parameters of Dam water and river. Prevalence cestode parasites in fish host are changing accordingly month because change in water quality with respect of physiochemical parameters.

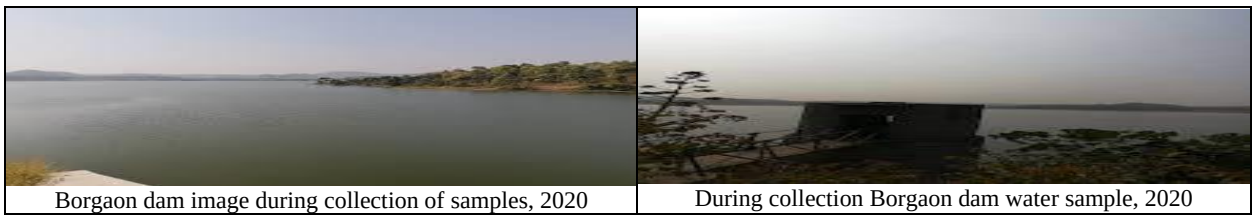
Keywords: physico-chemicals analysis, Borgaon Dam water sample & review on fish parasite etc

Introduction
Physiochemical parameter analysis important because of the fish health depends on it. Conservation and production dramatically decreases due to water condition of dam because water has number of properties and these properties proved water quality. Water quality continuously changeable due to pollution and change exist physical, chemical and biological properties. Present study focused on physiochemical properties of borgaon dam fresh water and their effect on fish health or fish diseases correlation. In fresh water fishes become susceptible to parasites that are cestode mostly survive on fish and sucking their nutrition. So, fish productivity and production decreases in dam's water because of polluted water which is favourable condition to fish parasite cestode. Hossain *et al* [20] worked in 2007 on fish parasites shows positive correlation between water quality and fish parasites infection to fish effect on their overall development like growth, reproduction etc. Due to polluted water in dam aquatic animals become susceptible to diseases specially fish parasites confirmed by khan and Thulin in 1991. Yerima *et al*., 2017 Fish researcher have reported physiochemical properties directly or indirectly effect on the aquatic environment and different aquatic animals and especially on fish. Ojwala *et al* in 2018 [15] reported that the physiochemical parameter of water and prevalence of various parasites shows positive correlation. Also, water quality parameters such as alkalinity, pH, and hardness, BOD (Biological oxygen demands) COD (chemical oxygen demand) and also some heavy metal, sodium, calcium, phosphate, cadmium, nitrates etc. involved in losses of fish quality, mortality and production.
Therefore, necessary to investigate the Physico-chemicals parameters of Borgaon Dam water for further studies on fish parasite and diseases and their correlation with physio-chemicals parameter of water.

Materials and Methods
Fishes sample were collected from borgaon dam yevatmal district during the year 2020 and 2021. In present investigate cestode parasite prevalence from freshwater fishes *viz Shingala*, and *Wallago attu* they collected and examined for cestode infection. Then cestode parasite were preserved in 4% formaline, washed in saline and water, dehydrated in various alcoholic grades, stained with Harris haematoxylin and Borax carmine, cleared in xylene, mounted in D.P.X. Drawings were made with the aid of camera Lucida and identification by standard methods (Gerald D. Schmidt, 1934; Yamaguti, S., 1959; Hiware, Jadhav and Mohekar, 2003; and Bhure, 2008) [21, 5].
Prevalence (Incidence) of infection were recorded and calculated according to Margolis *et.al*., (1982) [3]. and D. B. Bhure *et.al*, (2016).

$$\textbf{Prevalence of Infection (\%)} = \frac{Number\ of\ Infected\ Host}{Number\ of\ Total\ Host\ Examined}\ X100$$

Water sample were collected from Borgaon Dam in sterilized sampling bottle and analyzed different physico-chemicals parameter as per previously method used by authors.
The temperature of water measured with help of glass thermometer on experimental site dam water as well as river water, P^H of water measured by digital P^H meter, water conductivity is measured by conductivity meter model no. EQ660B. remain all physiochemical parameters carried out used methods by APHA, 2012 [1], NEERI, Govt. of India and Ashwini *et al*.2015.



Borgaon dam image during collection of samples, 2020 | During collection Borgaon dam water sample, 2020

Fig 1

Results and Discussion

Table 1: Monthly variation of Cestode parasite in freshwater fishes from Borgaon Dam

Sr. No.	(DD/MM/YY)	No. of dissected Hosts	No. of infected Hosts	Total No. of parasites collected	Prevalence %
1	06 Oct. 2020	10	04	02	22.00
2	18 Nov. 2020	10	03	04	09.21
3	19 Dec 2020	10	04	02	13.12
4	22Jan. 2021	10	02	03	06.65
5	20Feb 2021	10	03	05	04.87
6	28Mar.2021	10	06	04	21.82
7	30 Apr 2021	10	08	05	29.12
8	29 May 2021	10	11	12	37.89
9	26 Jun. 2021	10	03	04	18.16

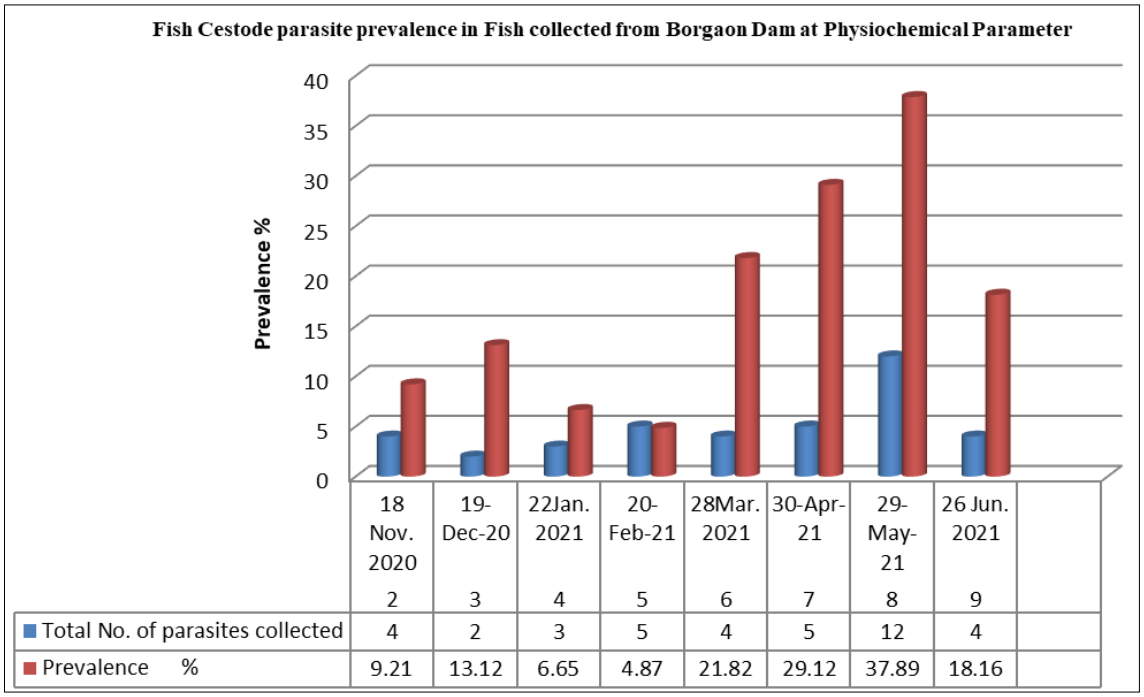


Fig 2

Table 2: Cestode parasite found in freshwater fishes from Borgaon Dam

Cestode Parasite sp	Host	Habitat	Locality
1) *Circumonchobothria sp.*	*Shingala and Wallago attu*	Intestine	Borgaon dam
2) *Gangesia sp.*	*Wallago attu*	Intestine	Borgaon dam
3) *Senga sp.*	*Wallago attu*	Intestine	Borgaom Dam

Cesode parasites *Circumonchobothria sp*, *Gangesia sp*. and *Senga sp.* found in host *Shingala and Wallago attu* and their prevalence mentioned in table 1. at physiochemical parameters of Dam water and river. Prevalence cestode parasites in fish host are changing accordingly month because change in water quality with respect of physiochemical parameters.

shingala	***Wallago attu***	***Collected Cestodes***

Fig 3

Table 3: Physico-chemical Parameter of Borgaon Dam fresh water 2020-2021

Sr. No.	Physico-chemical Parameter	Borgaon dam	River
1	Temperature (C°)	19.02	20.22
2	pH	7.1	7.2
3	Turbidity (NTU)	151	148
4	Conductivity (EC) (dS/m)	0.24	0.22
5	TDS (mg/L)	227	213
6	CO_2	5.1	4.9
7	Total hardness(mg/L)	114.4	103.2
8	Dissolved Oxygen (mg/L)	08.7	08.4
9	Chemical oxygen Demand (COD) (mg/L)	5.06	5.01
10	Biological Oxygen Demand (BOD) at 5^{th} day (mg/L)	8.8	7.67
11	Cadmium (Cd)(mg/L)	0.12	0.091
12	Calcium (mg/L)	32.12	31.65
13	Chlorides (mg/L)	43.22	42.06
14	Iron (Fe)	0.16	0.13
15	Lead (Pb) (mg/L)	0.019	0.012
16	Magnesium (mg/L)	2.01	1.91
17	NO_2 (mg/L)	0.18	0.13
18	NO_3(mg/L)	0.1	0.07
19	Sodium (mg/L)	32.05	29.35
20	Total Sulphate (mg/L)	12.09	10.17
21	Total alkalinity (mg/L)	89.2	92.08
22	Total ammonia (NH3) (mg/L)	1.08	1.01

Note: All results in three replicates

Temperature important for growth and development of cestode parasites in fish host in present dam and river temperature were recorded on site 19.02, 20.55 and their pH 7.1 and 7.2 respectively. Turbidity and conductivity of borgaon dam water and river 151; 148 NTU and 0.24; 0.22 dS/m respectively. Also, TDS and total hardness of both water samples are 227; 213mg/l and 114.4 and 103.2 (mg/l). DO and COD recorded in both sample are 08.7& 08.4 mg/ml and 5.06 5.01 mg/l. Biological oxygen demand of given samples were recorded on 5^{th} are 8.80 & 7.67 mg/l. In present heavy metal and non-metal are also recorded from given sample are Nitrate 0.19, 0.12 mg/l; Ammonium 1.13;1.02; Alkalinity 97.1, 94.45 mg/l; in both sample Chloride 43.22,42.06; sulphate 12.09,10.17; Calcium32.12,31.65; Magnesium 2.01,1.91; Sodium 32.05,29.35; lead 0.019, 0.012 and Cadmium 0.16, 0.13 mg/l respectively (Table.3).

Discussion and Conclusion

Physio-chemical parameters of water are important factor for fish health as well as fish production and due to this parameter effect on fish infection by parasite causes different disease to fish. So, this review on fish parasite infection at physico-chemicals parameter and results revealed that physico-chemical parameter of water showed that the positive correlation with fish parasite and their prevalence, intensity and abundance and it is help for further studies on fish parasite occurrence in Borgaon dam fresh water and their effect of physico-chemical parameter. All results helpful in investigation cestode parasites in fish on the basis of physiochemical parameters consideration for loss of fish production and productivity and effect on their overall growth in water. Researcher Chubb in 1980 and zargar *et al*. in 2011 [14] recorded the cestode parasites correlation with physiochemical parameters of water and they concluded that the physiochemical parameters shows positive correlation with occurrence of cestode parasite in fish.

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