Fish Diversity And Physicochemical Parameters In Jambahar (Pharsabahar) Pond Of Jashpur District, Chhattisgarh, India

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Abstract
The present study and investigation has been done on the physiochemical condition and fish diversity of Pharsabahar pond of Jashpur district from January 2021 to December 2021. During the study period 28 fish species belonging to 11 families and 19 genera were recorded. The dominant family was Cyprinidae contributing 18 species family. Cyprinidae was represented by the Catla-catla, Cirrhinus-mrigla, Labeo-rohita, Labeo-potail, Puntius sarana, Puntius sophore, Puntius ticto, Hypothalmicthys molitrix, Cyprinus Carpio, Ctenopharungodon idella, Oxygaster gara, Cobitidae by Lepidocephalichthys guntea, Siluridae by Wallago attu, Bagridae by Mystus cavasius, Mystus vittatus, Mystus oar, Saccobranchidae by Heteropneustus fossilis and Clarridae by Clarius batrachus. The observation from the present study proves that valuable changes have occurred due to environmental conditions in the locality. The physicochemical parameters of Pharsabahar pond varied seasonally. Such as Temperature, Turbidity, PH, Dissolve Oxygen, Co_2, Hardness, Nitrate, Transparency, Cloride, Conductivity, TDS, Alkality. For understanding fish diversity water analysis is important. Fish diversity of Pharsabahar pond is depended on the chemical and physical parameter of water.

Introduction
The degree of variation of life in a given ecosystem is biodiversity for ecosystem stabilization protection biodiversity is essential. To describe the number, variety and variability of organism in a particular area biodiversity term is used. India is very rich in terms of biological diversity due to its unique bio geographic locations, enormous eco diversity and geo diversity and diversified climatic conditions. In terms of fresh water mega biodiversity India is in ninth position. India is one of the mega biodiversity countries. In India there are 2,500 species of fishes of which 1570 are marine and 930 live n freshwater (Kar *et al* 2003). (Talwar 1991) estimated 2546 species of fish belonging to 969 genera, 254 families and 10 orders from India. (Day 1994) described 141 species of fish under 342 genera from British. (Jayram 1981) listed 742 fresh water species of fishes coming under 233 genera, 64 families and 16 orders from the Indian region. In the world about 21730 species have been recorded of which about 11.7% are found in Indian water. Today associate habitat management & fish diversity is a great challenge and the ability to evaluate the effect of habitat change and other impact on the fish population. During the decades number of workers has investigated on Indian reservoir and fish fauna, but there is no record of fish fauna of Pharsabahar pond. Hence I decided to study on the fish diversity in Pharsabahar pond. It is therefore important to know about the water quality parameters of Pharsabahar pond.

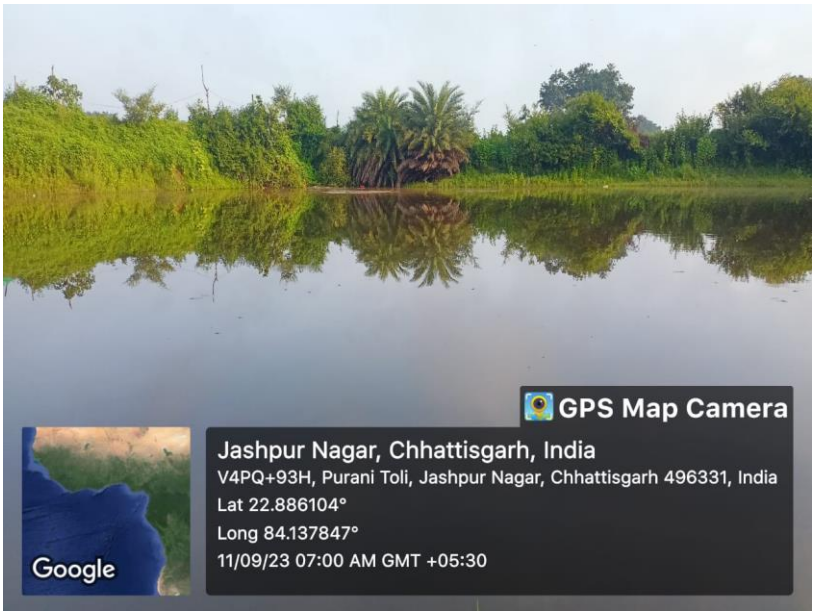
Temperature is controlling the rate of biochemical reaction and metabolism. Turbidity desirable in fish life because its provide food for microscopic animals and filter-feeding fish. Water Ph affects physiological process and metabolism of fish. Water quality is related to aquatic ecology there is important role of physicochemical condition of water for growing of fish and other aquatic animals. Fish diversity studied with reference to the fluctuations and environmental changes that according to physicochemical parameters of the environment. Water quality of fish must carry dissolved gases like Co_2, O_2, Ph, Conductivity minerals, TDS, alkalinity. This study was carried out to fish diversity status with relation to major biochemical parameters. The physical condition of water is greatly influenced with depth, Turbidity, Temperature, light & colour. In this study identified to Turbidity, Temperature, Ph, Dissolve oxygen, Dissolve Co2, Transparency, Hardness, Nitrate, Conductivity, Chloride, Alkalinity and TDS of Pharsabahar pond.

MAP OF CHHATTISGARH **JASHPUR DISTRICT MAP**

Source: - Google image

1. https://images.app.goo.gl/Jcy7rwbC5bU7w8EU6
2. https://images.app.goo.gl/wtJAw4surmxd8CbUA

MATERIAL & METHODS:



Jambahar Pond (Pharsabahar)

Jashpur district is a district of the Central Indian state of Chhattisgarh bordering Jharkhand and Odessa. The North-South length of this district is about 150 k.m. and its east-west breadth is about 85 k.m. Its total area is 6205 km^2. It's locates between 22°17' and 23°15' North latitude and 83°30' and 84°24 east longitude. Geographical area was 6701 km^2.

Pharsabahar is a town in Pharsabahar tahsil in Jashpur district of Chhattisgarh state, India. Pharsabahar is situated 58 km towards south from the district Jashpur nagar. The total geographical area of village is 2116.26 hectares. Pharsabahar has a total population of 4339 peoples. The block area lies between 22.286 & 22.627 N latitudes and 83.771 and 84.055E longitude. Pharsabahar is a basically tribal place.

It is governed by Pharsabahar gram panchayat. Pharsabahar panchayat samiti is a rural local body in Jashpur district parishad. The nearest town is Tapkara. The distance of Pharsabahar from Tapkara is 9.8 km.

The pond which was selected from Pharsabahar is named as Purainbandh pond. The shape of the pond is irregular. The length and width of the pond is 1550 meter and 630 meter and the depth is 2-10 meter. Pond fills up with rain water. The water of this pond is also used for irrigation purpose. No outlet source available in this pond for cleaning the pond. It required ten the ram of the pond is cut and the water is taken out from the pond. The age of this pond is unknown this pond is very old.

Till now no study has been done on fish fauna in Pharsabahar pond.

Fishes in Pharsabahar pond were collected with the help of local fishermen's. Many types of nets were used for the collection of fishes i.e. gill nets, cast nets, drag net etc. Then fishes were preserved in 8-10% formalin solution. Study was done from January 2021 to December 2021. Identification of fishes will be done on the bases of descriptive

character, morphoteric character & fin formula. Morphoteric character includes standard length of the body total length of the body position & diameter of eye, length and depth of the head, length of snout, maximum & minimum width & girth. Length of pre pectoral fin, pre dorsal fin, pre anal fin and pre caudal fin, descriptive character includes skin texture, profile & shape of the body, position and shape of the mouth, colorations, shape of lips & jaws and snout, scale and lateral line system, size shape and types of median, fin rays and fin formula, paired & caudal fins, tail and special marking. A field kit measuring tap, preservative, rope, digital camera etc. will be prepared for regular use. Fishes will be classified and arranged based on standard key of Jhingran (1983) with slight modification as followed by Day's fauna 1958 and Shrivastava 1998. Water samples are collected month from the sampling points during the study period January 2021 to December 2021. The water quality Parameters such as water temperature was measured with the help of mercury thermometer. Ph level studied with the help of Ph meter. With the help of water analyzer and photo spectrometer, conductivity, DO, TDS, Transparency, Alkalinity and Dissolved oxygen was tested.

RESULT AND DISCUSSION

Jashpur district is non polluted area in Chhattisgarh. During the study period total 28 fish species belonging to 11 families and 19 genera were recorded. Cyprinidae was the largest dominant family among them which contributed 18 species family Cyprinidae was represented by Cyprinidae was represented by the Catla-catla, Cirrhinus-mrigla, Labeo-rohita, Labeo-potail, Puntius sarana, Puntius sophore, Puntius ticto, Hypothalmicthys molitrix, Cyprinus Carpio, Ctenopharungodon idella, Oxygaster gara, Cobitidae by Lepidocephalichthys guntea, Siluridae by Wallago attu, Bagridae by Mystus cavasius, Mystus vittatus, Mystus oar, Saccobranchidae by Heteropneustus fossilis and Clarridae by Clarius batrachus.

Through observation we came to know that the valuable changes have occurred due to the environmental condition in the locality, Turbidity, depth temperature etc. temperature of water observed and studied monthly and also measured at the time of sample collection. The samples were collected between 10 to 12 am on every month.

Temperature – It is one of the most factor temperature varies during different seasons of the year and also varies at different times of the day. Variations in temperature of H2O body have great impact upon its productivity. Fish metabolic & physiological activities of life process are influenced to by water temperature. Average temperature of H_2O is between 15.5ºC to 37.5ºC. In other word, we can be said the lowest value of temperature during winter month and highest value during summer season.

Turbidity – It is important factor in natural water productivity. It controls photosynthetic activities and is responsible for penetration of sunlight. The average turbidity of water Pharsabahar pond fluctuates between 5.5 to 12.5 cm. Maximum turbidity noted in month of July and minimum in month of May 2021. Turbidity values are higher during rains, but decreasing in the winter and summer season.

Ph – It is hydrogen ion concentration of liquid. It is important factor of natural water in environment. It is important factor which is contributing to the productivity influencing the species composition and affects nutrients availability and relative toxicity of many trace elements. Ph value of 7 is natural water. In present study Ph range was recorded 6.5 to 7.5 Ph value is highest in month of August and lowest in the month of May.

Dissolved oxygen – Carbon dioxide and Oxygen are important gas dissolve in water. Oxygen is required for metabolic process of living organism. In the study site the concentration of dissolved oxygen was notes in each site. It ranges an average of from 6.5 to 9.7 mg/l. Then maximum dissolved oxygen concentration recorded 9.7 mg/l the month of January while minimum of 6.5 mg/l in the month of June.

The value of dissolved oxygen shows seasonal trend it shows high value in the season of winter, while low values in the summer.

Dissolved Co_2 – The value of **Co_2** fluctuated from 2.5 to 5.3 mg/l in present study, which was the maximum in September and least in April.

Total Hardness – It depends upon the magnesium & calcium salts dissolve in water. The average maximum concentration of 47.00 mg/l of hardness was recorded in pond water in the month of September and minimum 38.00 mg/l in the month of April.

Transparency - The transparency of water range from 33.0 to 40.0 during investigation time lowest transparency was recorded during November and highest values were recorded during August.

Nitrate – During the study highest Nitrate 24.2 mg/l in the month of August and lowest 20.0 mg/l in the month of January 2021.

Chloride – Chloride value of pond varied from 53.8 to 150 mg/l. This was observed minimum in winter and maximum in summer.

Conductivity – It is a measure of the ability of water to pass electric current. The specific conductivity of water range between 241 to 420 micro mho/cm.
TDS – It is salinity indicator for classification of water. It is present in water due to presence of calcium, Magnesium, Sodium, Potassium, Bicarbonate, Chloride and Sulphate ions. In the study area TDS varied from 120.0 to 234.0.
Alkalinity – It increases during December month and decreases during July. In this way we can say that the pond of Pharsabahar has better biological production for the fishes. The maximum average values were observed n the month of December 57.5 mg/l. While its minimum values were 15.5 mg/l in the month of July.

TABLE-1 List of Fishes Identified In Jambahar (Pharsabahar) Pond January 2021 to December 2021

Order	Family	Genus and Species	Local Name
Clupeiformes	Clupeidae	Notopterus-Notopterus	Patra
Cypriniformes	Cyprinidae	Catla-catla	Bhakhur
		Cirrhinus-mrigla	Mrigal
		Labeo-rohita	Rohu
		Labeo-potail	Potli
		Puntius sarana	Kotra
		Puntius sophore	Jarhi Kotri
		Puntius ticto	Jarhi kotri
		Hypothalmicthys molitrix	Silver carp
		Cyprinus carpio	Common carp
		Ctenopharungodon idella	Grass carp
		Oxygaster gara	Dhan
	Siluridae	Wallago attu	Baliya
	Bagridae	Mystus covasius	Tengna
		Mystus vittatus	Tengna
		Mystus oar	Singhi
	Saccobranchidae	Heteropneustus fossilis	Singhi
	Clarridae	Clarius batrachus	Mangur, Mongri
Ophiocephaliformes	Ophiocephalidae	Channa gachuga	Chanaga
		Channa marulius	Sanwal
		Channa punctatus	Khoksi
Perciformes	Centropomidae	Chanda nama	Chandeni
		Chanda ranga	Chandari
	Cichlidae	Oreochromicus mossombicus	Tilepia, Perwa
Mastacembeliformes	Mastacembelidae	Mastacembalus armatus	Bami
		Macrognathus acculeatus	Jat bami

TABLE – 2 Species Diversity of Fishes in Jambahar (Pharsabahar) Pond January 2021- December 2021

S. No.	Order	Family	No. of Fish Species
1.	Clupeiformes	Clupeidae	1
2.	Cypriniformes	Cyprinidae	11
		Cobitidae	1
		Siluridae	1
		Bagridae	3
		Saccobranchidae	1
		Clarridae	1
2.	Ophiocephaliformes	Ophiocephalidae	3
3.	Perciformes	Centropomidae	2
		Cichlidae	1
4.	Mastacembeliformes	Mastacembelidae	3

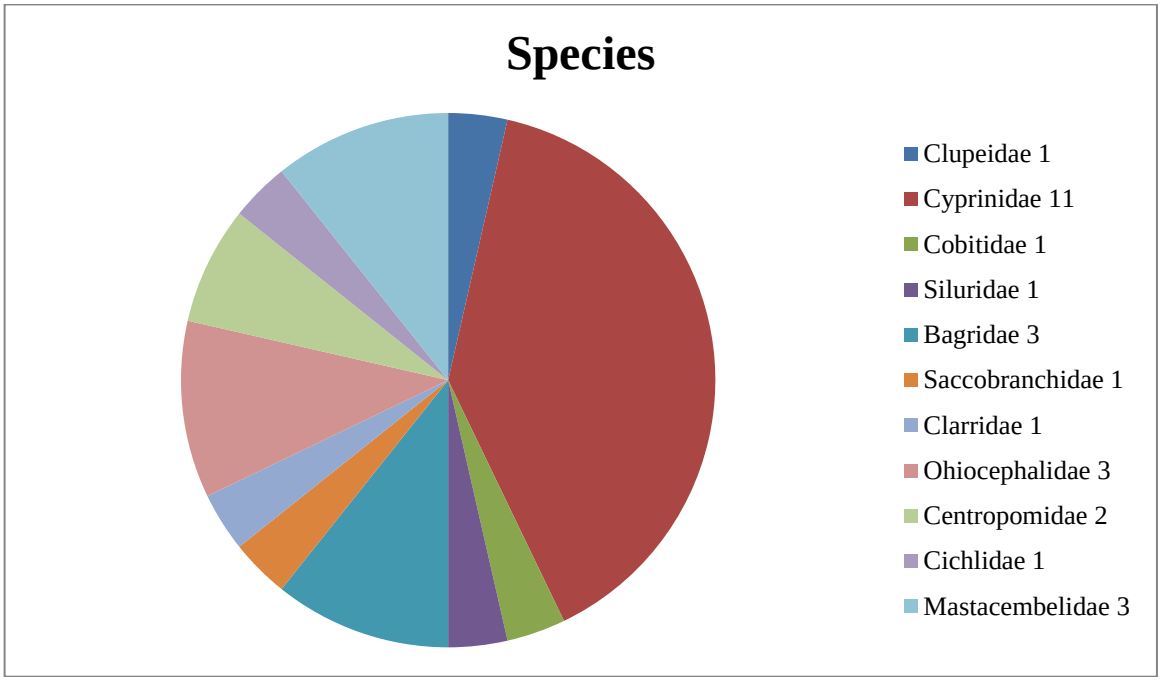


Fig. 1. Presentation of family wise fishes in Jambahar (Pharsabahar) Pond

TABLE – 3 Physicochemical characteristics of Jambahar (Pharsabahar) Pond During January 2021 to December 2021

Month	Temp.	Turb.	Ph.	DO	DCo_2	Har	Trans.	Nitrate	Cloride	Cond.	TDS	Alka.
	^oC	NTU		Mg/l	Mg/l	Mg/l	Cm	Mg/l	Mg/l	Micro mho/cm	Mg/l	Mg/l
January	15.5	9.8	7.2	9.7	4.0	37.5	33.82	20.0	53.8	360	194	50.5
February	18.3	9.5	6.7	9.1	3.5	37.3	33.5	20.4	50	373	197	54.5
March	23.5	8.5	6.6	7.3	3.2	36.5	33.22	20.5	54	385	205	15.6
April	28.3	6.5	6.6	7.2	2.5	38.0	33.11	21.3	56	405	221	19.5
May	36.4	5.5	6.5	6.7	3.1	36.3	34.22	23.1	57.0	420	234	34.7
June	37.5	7.5	7.0	6.5	3.4	35.5	34.0	23.5	130	418	211	37.7
July	22.2	12.5	7.1	6.1	3.6	34.6	39.5	24.0	150	373	171	15.5
August	25.7	11.5	7.5	6.3	4.3	44.5	40.0	24.2	117.4	327	120	16.5
September	24.5	11.0	6.9	8.7	5.3	47.0	39.17	23.7	9.5	241	154	56.7
October	23.4	10.5	6.5	9.4	5.1	45.5	38.15	22.4	75.	238	161	54.3
November	21.8	10.3	7.3	9.3	4.4	43.5	33.0	22.0	57.5	325	170	52.5
December	17.2	10.0	6.8	9.2	4.1	42.2	33.9	21.7	54.3	339	181	57.5

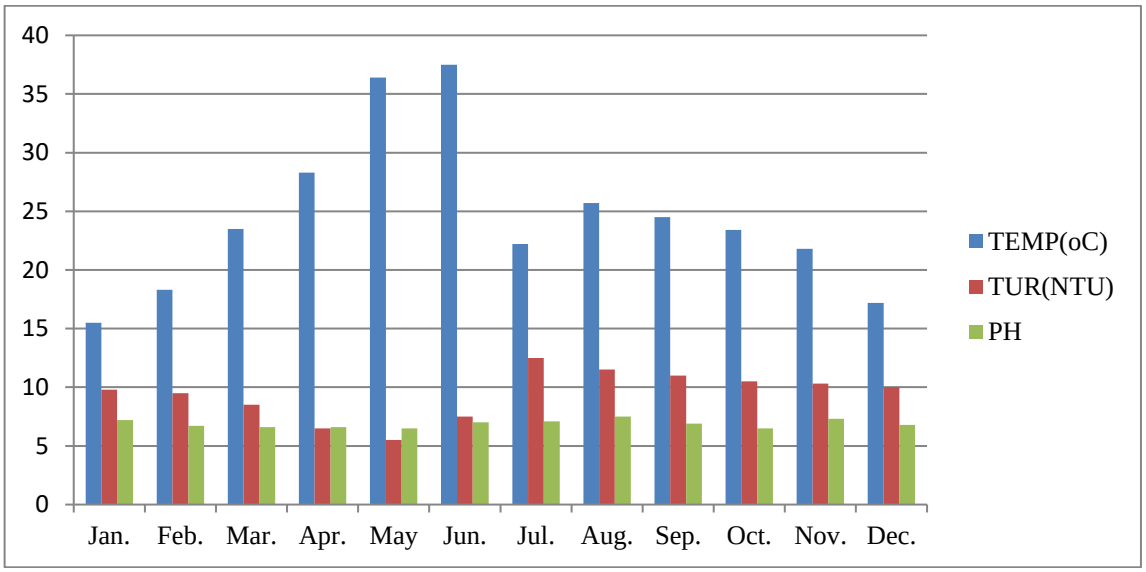


Fig. 2. Physicochemical characteristics (TEMP., TUR., PH.) 2021

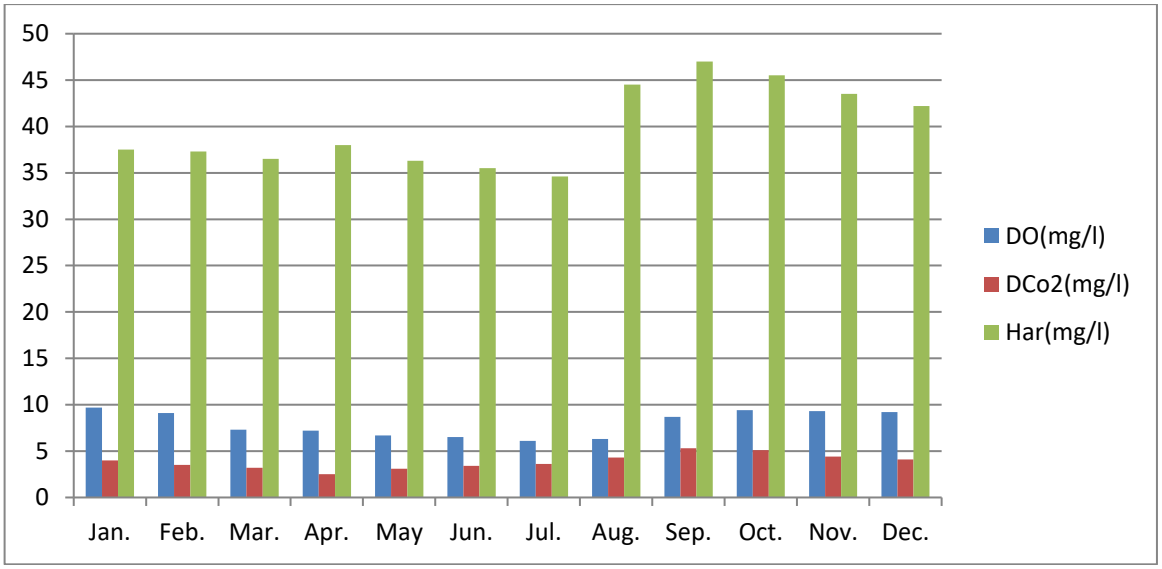


Fig. 3. Physicochemical characteristics (DO., DCo_2., Har.) 2021

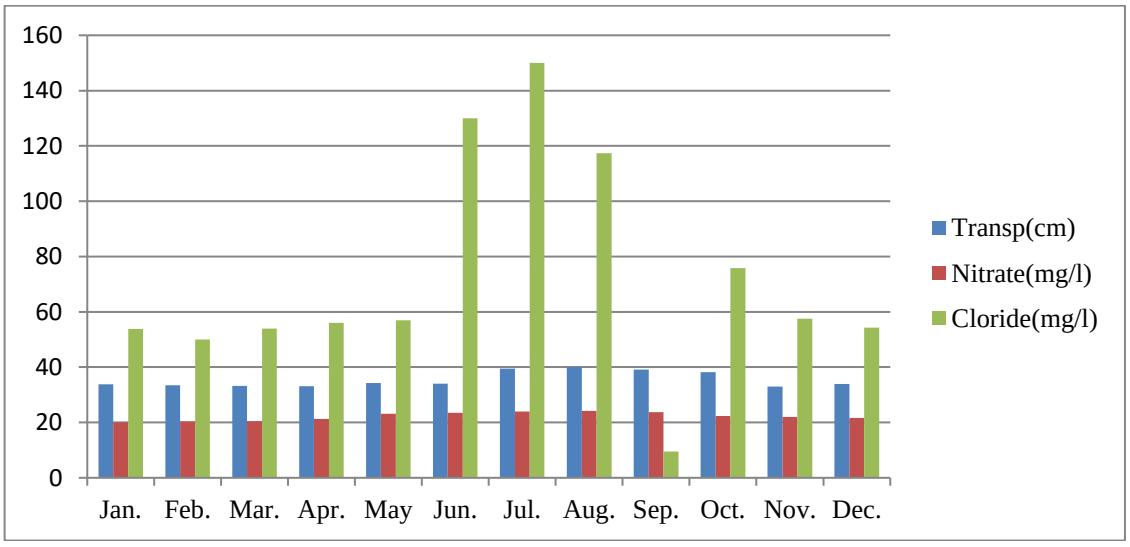


Fig. 4. Physicochemical characteristics (Transp., Nitrate., Cloride.) 2021

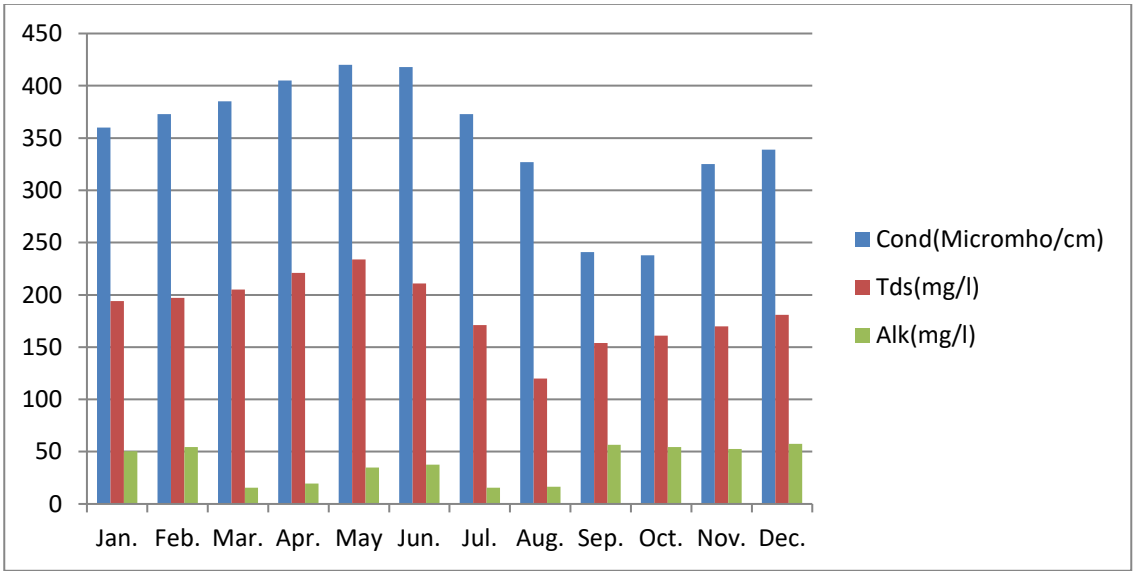


Fig. 5. Physicochemical characteristics (Cond., Tds., Alk.) 2021

CONCLUSION

Fish biodiversity is an important aspect to know and understand different ecosystem and influence on them. The result of this study shows that the Pharsabahar pond is a biodiversity of fishes. During this study period has show a good indication of rich biodiversity. Pond management as well as public awareness is essential to save the fish fauna of this pond.

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