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LIMNOLOGY OF ZARPAT RIVER IN CHANDRAPUR WITH REFERENCE TO ITS POLLUTION

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ABSTRACT:
Zarpat river is a tributary river of Erai river in Chandrapur. It flows through Rayatwari coalary, Mahakalidevi temple and lastly meets Erai river near Mana village at Pathanpura gate, Chandrapur. Erai river meets Godavari river in Andhra Pradesh. A survey of Zarpat river was done during the month of February, 2024 to study its limnology with reference to its pollution. For this purpose, water samples were collected from three stations, viz., Rayatwary coalary, Mahakalidevi temple and Mana village near Pathanpuragate, Chandrapur and analyzed them in the laboratory. During the study period, physical and chemical parameters were ranged as, atmospheric temperature – 31 to 36^{o}C, water temperature-26 to 30^{o}C, pH-7.5 to 7.8, Salinity-0.89 to 0.95 ppt, Calcium-3.7 to 4.2 mg/l, Magnesium-2.4 to 2.8 mg/l, Sodium-1.46 to 1.62 mg/l. Potassium-1.12 to 1.45 mg/l, Carbonate-3.2 to 3.8 mg/l, Bicarbonate-2.4 to 2.9 mg/l, Chlorides-3.2 to 4.2 mg/l, and Sulphates-0.75 to 0.95 mg/l. Nitrates was nil in all these three stations. Thus, total 13 water parameters were studied. Out of these, Salinity, Calcium. Magnesium, Carbonates, Bicarbonates and Chlorides were found more than average range. This study shows that Zarpat river is polluted due to the anthropogenic activities. Its water is not potable and may be useful for agriculture purpose by farmers at its bank.

Keywords: - Zarpat river, Limnology, Physico-chemical parameters, Pollution study.

INTRODUCTION :

Water is an important abiotic component on the earth. According to Anani *et al.,* 2020, water quality is important for the healthyness of any river. Rajurkar *et al.,* (2015) states that physical, chemical and biological parameters plays major role for maintaining the quality of water. Tomar *et al.,* (2022) research shows that biotic and abiotic factors are inter related with each other. Matta *et al.* (2018) was concluded from his studies that there is variation in physico-chemical characters and planktonic composition. Beside these, less pollution load was observed at control site in comparison to other site. They also concluded that the Henwal river requires the better treatment before any utilization. Dahegaonkar (2023) was observed the limnological profile of Erai river in Chandrapur and reported that Erai river is polluted due to sewage and industrial effluents. As the limnology is deals with the study of physico-chemical characteristics. It is an important branch of life science. Zarpat river is polluted due to the anthropogenic activities. Therefore, its study was necessary.

MATERIALS AND METHODS

Zarpat river is in Chandrapur and flows through slum area of Rayatwary coalary, Mahakalidevi temple and lastly meet Erai river near Mana village near Pathanpura gate, Chandrapur. Erai river meets to Godawari river in Andhra Pradesh. In order to study the limnology of Zarpat river with reference to its pollution, a survey was done in February, 2024. For this study, three stations were selected, viz., Rayatwary coalary area, Mahakalidevi temple area and Mana village. Water samples were collected from these three stations (Figures 1 to 3) and analyzed them in the laboratory. Figure 4 is shows a view of Erai river where Zarpat river meets to Erai river near Pathanpura gate, Chandrapur.

RESULTS :

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The limnological parameters of Zarpat river in Chandrapur are shown in Table-1.

Thus, total 13 limnological parameters of Zarpat river were analyzed in the laboratory. In Table-1, it was observed that, atmospheric temperature ranged between 31 to 32°C, water temperature-26 to 30 °C, pH-7.5 to 8.0, Salinity-0.89 to 0.95 ppt, Calcium hardness-3.7 to 4.2 mg/l, Magnesium hardness-2.4 to 2.8 ppt, Sodium-1.46 to 1.62 mg/l, Potassium-1.12 to 1.45 mg/l, Calcium carbonate-3.2 to 4.2 mg/l, Calcium bicarbonate-2.4 to 2.9 mg/l, Chlorides-3.2 to 4.2 mg/l, Sulphates-0.75 to 0.95 mg/l and Nitrates was nil in the water of Zarpat river.

DISCUSSION :

Generally rivers get polluted due to industrial effluents, sewage waste, anthropogenic activities, etc. Zarpat river is polluted due to the anthropogenic activities of slum area. Its water is not potable due to pollution, hence, checked its water parameters. They shows variations. Similar results were obtained to Matta *et al.,* 2018; Tomar *et al.,* 2022; Dahegaonkar, 2023. Rajurkar and Dalal, (2015) observed variations in physico-chemical parameters of Vena river at Higanghat. Das *et al.* (2015) was noted the physico-chemical parameters of river Singla in Assam, India with reference to its fish diversity. Their results revealed low and high free carbon dioxide in the river. Rewatkar *et al.* (2015) was observed the hydrobiological profile of Kathani river near Gadchiroli and found that water parameters were in limited range. Islam *et al.* (2019) studied the Kushiyara river in Bangladesh. Overall, this study was found good water quality with rich biodiversity. Anani *et al,* (2020) had made limnological evaluation of water quality of Ossimo river in South Nigeria. The parameters were highly influenced by lithogenic and anthropogenic activities. According to Nogueira *et al.* (2021), the water quality parameters were influenced by anthropogenic activities. Saksena (2022) was observed the limnological research status in India. Thus, the present study, shows variation in physico-chemical parameters and water of the river is polluted due to the anthropogenic activities.

CONCLUSION :

1. Water of the Zarpat river is polluted due to the anthropogenic activities.
2. Its water is not potable and may be useful for agriculture purpose by farmers at its bank.

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Table 1: Limnological parameters of Zarpat river in Chandrapur.

Sr. No.	**Limnological parameters**	**Station-1:** Rayatwary coalary	**Station-2:** Mahakalidevi temple	**Station-3:** Mana village	**Average Range**
1	Atmospheric temperature (°C)	32	36	31	31 - 36
2	Water temperature (°C)	26	30	30	26 - 30
3	pH	8.0	7.6	7.5	7.5 - 8.0
4	Salinity (ppt)	0.95	0.89	0.94	0.89 - 0.95
5	Calcium hardness (mg/l)	3.7	4.2	3.9	3.7 - 4.2
6	Magnesium hardness (mg/l)	2.6	2.4	2.8	2.4 – 2.8
7	Sodium (mg/l)	1.46	1.62	1.55	1.46 – 1.62
8	Potassium (mg/l)	1.23	1.12	1.45	1.12– 1.45
9	Calcium carbonate (mg/l)	3.4	3.8	3.2	3.2 – 3.8
10	Calcium bicarbonate (mg/l)	2.4	2.8	2.9	2.4 – 2.9
11	Chlorides (mg/l)	3.2	4.2	3.8	3.2 – 4.2
12	Sulphates (mg/l)	0.75	0.85	0.95	0.75 - 0.95
13	Nitrates (mg/l)	Nil	Nil	Nil	Nil

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Figure-1: Sampling at Rayatwary coalary.

Figure-3: Sampling at Mana village.

Figure-2: Sampling at Mahakalidevi temple.

Figure-4: View of Erai river where Zarpat river meet near Pathanpuragate, Chandrapur.

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