



Ecology of Amba Nala, Amravati, Maharashtra, India

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ABSTRACT

Water is an elixir for life on the earth but due to population explosion, urbanization and industrialization causes heavy and varied pollution, which directly or indirectly affects the living components. The contaminated water induces many health hazards causing many diseases. An estimated 80% children from villages suffer from waterborne diseases, which is due to contamination of river water. In this context, the present investigation on Physico-chemical parameters of Amba Nala was carried out to observe the pollution and its effects on the water of Amba Nala is fed by open Amba Nullah sewerage of a metro city, Amravati.

Key words: Ecology, Amba Nala.

INTRODUCTION

In recent years due to the population explosion and heavy urbanization rapid degradation of lakes and rivers has occurred (Kodarkar, 1995, Bhave and Borse, 2001 and Bobdey et. al., 2007). Amba Nala receives the sewage through its sewerage of metro city Amravati, which is highly polluted by faecal matters, Homemade detergent wash out and some industrial waste. Interestingly the water from Amba Nala is mostly used for cultivation of vegetables. If properly managed the water can be used for irrigation as well as for fisheries as reported by several earlier workers (Ali, 2000 and Piska, 2000).

Therefore, present study was carried out to determine the Physico-chemical parameters of Amba Nala, Amravati, Maharashtra.

Four sampling stations were selected for investigation.

- Station-A- Wadali
- Station-B- Gopal Nagar
- Station-C- Amba Devi.
- Station- D- Lasanapur.

MATERIAL AND METHOD

Sewage water samples were collected from four stations in Plastic bottles, analysed within 24 hrs. Physico-chemical characteristics were analyzed on. Physical and chemical parameters like water temperature pH, turbidity and dissolved oxygen were analyzed using water analysis kit "Systronic Make" at the sampling site, while total alkalinity, total hardness, chloride and nitrates were examined in the laboratory using standard methods prescribed by APHA(2000) and Trivedi and Goel(1988).

RESULTS AND CONCLUSION

It was found that the water temperature of all the station remain unfluctuated and was in the range from 21.1°C minimum to 25.1°C maximum. Water pH showed acidic nature to slightly alkaline. At Station-A & Station-C turbidity was higher. The D.O was in the range from 6.48 mg/L to 8.29mg/L. The river water is alkaline in nature Chlorine content of water found below the permissible limit similarly nitrate content of river was identical at all the stations with little fluctuation. (Table 1).

Table 1: Mean \pm se and seasonal range of various physico-chemical parameters from different stations of Amba Nala

Sr. No	Parameters	Station			
		A	B	C	D
1	Water Temperature	(21.4-25.1) 23.22 \pm 0.373	(21.3-24.1) 23.06 +0.373	(21.4-24.1) 22.83 10.318	(21.1-24.6) 22.93 10.369
2	pH	(6.1-7.4) 6.46 \pm 0.13	(6.02-7.2) 6.46 \pm 0.107	(6.29-7.31) 7.03 \pm 0.1	(6.14-7.58) 6.96 \pm 0.159
3	Turbidity(NTU)	(44.11-53.72) 49.09 \pm 1.084	(46.22-52.55) 48.82 \pm 0.746	(43.89-54.78) 49.22 \pm 1.304	(42.67-53.17) 49.28 \pm 1.11
4	Dissolved Oxygen(mg/l)	(6.78-8.27) 7.42 \pm 0.144	(6.59-8.21) 7.32 \pm 0.164	(6.46-8.21) 7.63 \pm 0.226	(6.69-8.29) 7.69 \pm 0.172
5	Total Alkalinity (mg/l)	(140-338) 191.11 \pm 22.33	(132-268) 183.11 \pm 13.58	(142-304) 187.11 \pm 17.67	(136-263) 183.11 \pm 15.17
6	Total Hardness (mg/l)	(60-140) 91.11 \pm 9.2	(62-132) 94.00 \pm 8.192	(60-144) 94.67 \pm 9.27	(62-136) 87.33 \pm 8.02
7	Calcium Hardness (mg/l)	(28.6-58.9) 37.56 \pm 3.16	(31.1-8) 39.23 \pm 2.97	(26.9-47.9) 35.29 \pm 2.25	(26-136) 33.8 \pm 2
8	Magnesium Hardness (mg/l)	(5.4-19.7) 13.01 \pm 1.77	(5.9-22.2) 13.60 \pm 1.8	(6.2-23.4) 14.44 \pm 1.95	(6.5-26.2) 14.11 \pm 2.06
9	Chloride (mg/l)	(13.01-145.1) 78.96 \pm 16.29	(18.01-119.1) 78.63 \pm 14.2	(020.02-115.1) 67.06 \pm 12.76	(21.02-111.1) 59.95 \pm 10.3
10	Nitrate (mg/l)	(0.61-0.78) 0.7 \pm 0.018	(0.66-0.80) 0.71 \pm 0.019	(0.64-0.80) 72+ 0.021	(0.62-0.79) 0.70 \pm 0.021

In the present investigation examined water temperature from all the four stations were not much fluctuated, however minimum water temperature recorded during winter months it might be due to the shorter photo period. Kannan and Jog (1980) also observed decline in water temperature during winter and an increase in temperature during summer months.

The acidic pH observed mostly at all sampling sites could be correlated with finding of Bobdey et al. (2007) they observed neutral pH even to suspended Inorganic, Organic decay matter which is hazardous to fish death. Sustainable life of water organisms highly depends upon oxygen present in water in dissolved

state, alteration may cause respiration of animals, plants and bacteria, photosynthesis by green vegetation and also causing depletion habitation of flora and fauna (Piska, 2000)

In the present study no definite trend was noted, however D.O was found more during winter months which can be attributed to some pattern as observed by Singhai et al. (1990), Bhavne and Borse (2001). Total alkalinity was found to be mainly contributed by carbonates in the water.

Alkaline water is significant for biological activities and water of Amba Nala is hard which may be due to continuous accumulation of salts. The higher values

can be attributed to influx of domestic waste through adjoining Amba nullah sub channels. Sakhare and Survase (2001) reported higher values in Papnas wetland in Tuljapur town. Chloride content in water might be the effect of accumulation of organic matter of animal origin. In the present study random variation in nitrates was observed and no definite pattern was seen; however, higher values of nitrate were recorded during wintermonths which agrees with values observed by Singhal et al. (1990).

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Looking towards the state of water quality of Amba Nala which receives domestic sewerage from corporate Amravati city the water can be used for irrigation but will be unhygienic for human health.

Conflicts of Interest: The authors declare no conflict of interest.

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