

Comparison between Treated and Untreated water so as to study water treatment plant of Ahmadpur dist. Latur,

Sayyed Hussain^a, Vinod Mane^b, Surendra Takde^a, Arif Pathan^c, Mazahar Farooqui^{c,d}.

a- Sir Sayyed College, Aurangabad(MS), India

b- Mahatma Gandhi Mahavidyala, Ahmadpur, Dist Latur

c- Post graduate and research centre, Maulana Azad College, Aurangabad (MS) India.

d- Dr Rafiq Zakaria College for Women, Aurangabad (MS) India.

Abstract:

In the present work we are reported the Physico chemical properties like pH, conductivity, Turbidity, TDS, DO, fluoride, chloride, Sodium, Sulphate , etc. and the values are compared for treated and untreated water samples. The samples were collected from treatment plant of Ahmadpur, Dist Latur. The values changes apparently after the treatment of water.

Keywords: Ahmadpur, Water treatment plant, treated and untreated water, physico chemical properties.

Introduction

Water is the unique component of nature has played the crucial role in the evolution of life from molecules to Water pollution may generally divided into three categories i.e. ground water pollution, surface water pollution, and sea water pollution. Surface water means generally water from rivers lake, ponds etc. Surface water comes in direct contact with the atmosphere, Seasonal streams, rivulets and surface drain so there occurs continues exchange of dissolved and atmospheric gases while the wastes are added through water conveyance. Recently US Department of Health Education and welfare (HEW) has classified surface water pollutants in to different categories i.e. sewage and waste, Industrial effluence, particulate and atmospheric gases, Infectious agents, minerals and chemical compounds, Dissolved toxic pollutants and chemical compounds, dissolved toxic pollutants and surface run off thermal pollutants. , Radioactive nuclides, organic chemical toxic.

In polluted surface water the ions like Na^+ , K^+ , mg^{++} , So_4^{--} , H_2Po_4 interact forming a variety of complexes, there by deteriorating quality of the Precipitation the of surface water. Chemical processes like ion exchange, chelation, precipitation, coagulation, aggregation, oxidation, reduction and dissolution are operating simultaneously making the surface water extremely a complex system. The Physico – Chemical characteristics of water have direct impact on human beings. Hence the work was planed to investigate or assess the existing quality of take water (untreated) and municipal water (treated) which is supplied to urban area. The work is get

distributed in two parts i.e. in 1st part Physico-chemical analysis of take water observed and in 2nd part Physico-chemical parameters of treated water was analyzed which is purified by municipal corporation.

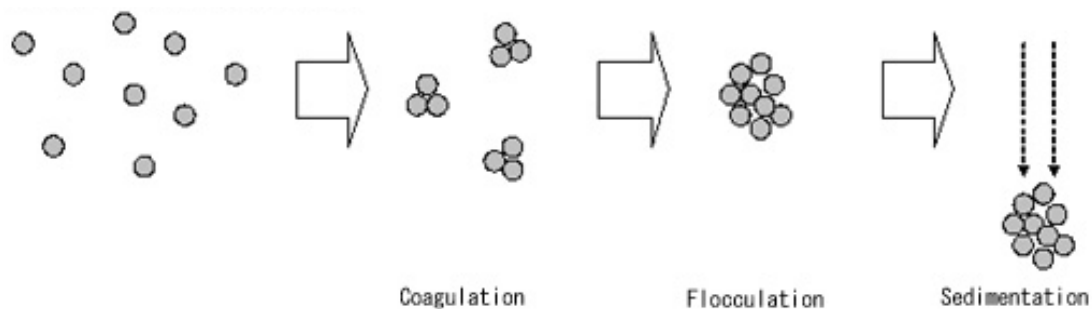
Materials and Methods

Here selection of sites was essential because, in the present investigation we have to analyze such water samples which are from lake and which must be treated by water supply department before supplying to urban population. Hence we select Limboti dam water for present investigation. Form Limboti dam, water is supplied to Ahmedpur city Limboti dam water was treated by Municipal Corporation of Ahmedpur. Municipal Corporation of Ahmedpur has a separate water purification plant, in around two acres of land.

Both water samples ware collected in the month of July-2010 and taken in pre cleaned polythene bottles. The collected samples were analyzed for measure physical and chemical water quality parameters like PH, TDS, T. Hardness, CA^{+2} , $So4^{-}$, Cl^{-} and fluorides. The analyses were carried out as per methods described by APHA (1998) and NEERI (2007)

Municipal Water Treatment Plant of Ahmedpur city

Many water treatment plants use a combination of coagulation sedimentation, filtration and disinfection to provide clean, safe drinking Water to the public. Worldwide, a combination of coagulation, sedimentation and filtration is the most widely applied water treatment technology, and has been used since the early 20th century.



Process of Coagulation, Flocculation and Sedimentation

The Municipal Water Treatment Plant of Ahmedpur city is based on the same combination i.e. coagulation, sedimentation, filtration and disinfection. Here Alum and Bleaching powder is used as Coagulant and Disinfectant respectively. A large sedimentation tank {fig. No 1} is made and sand filtration {fig.No.2} is used for filtration process.



Fig: No.1 Sedimentation Tank

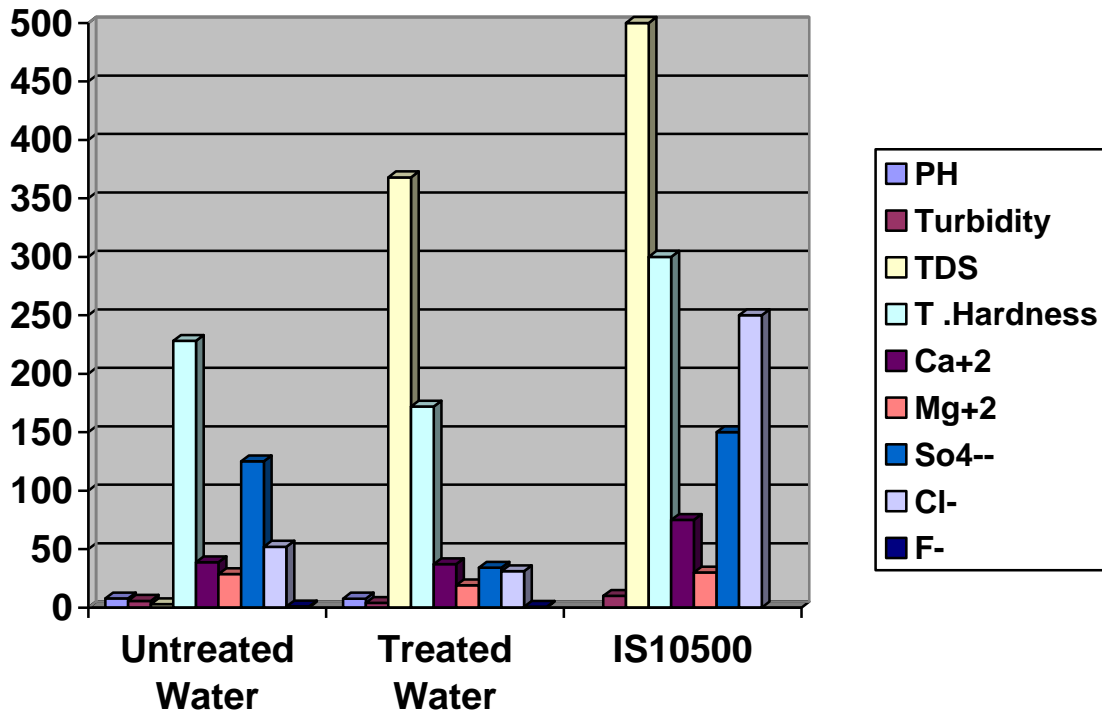


Fig No.2 sand Filtration

Parameters	Limboti Dam (s1) Water	Municipal (s2) Water	IS10500
PH	7.8	7.6	6.5 to 8.5
Turbidity	5.7	4	10
TDS	228	168	500
T.Hardness	228	172	300
Ca ⁺²	38.7	37	75
Mg ⁺²	28.52	19	30

So ₄ ⁻	125	34	150
Cl ⁻	52	31	250
F ⁻	0.85	0.60	0.6 to 1.2

All parameters are in mg/L except pH and Turbidity, Turbidity in NTU.



Result and Discussion:

Results of Physico-chemical Characteristics of untreated and treated water were recorded and tabulated in table No. 1.

pH:

pH is the measurement of potential activity of hydrogen ions in the sample. pH was positively correlated with electrical conductance and total conductivity [7]. In the present study pH founds 7.8 in lake water sample and 7.6 in treated water sample.

Turbidity:

Turbidity of water observed was 5.7 NTU in Lake Water and 4 NTU in treated water. The difference in turbidities of untreated water and treated water shows the municipal water treatment plant works better in case of lowering turbidity

Total Dissolved solids:

TDS test measures the amount or particles that are dissolved in water [jay1]. The Indian standard (IS10500) is 500 mg /L. In the present investigation, we found 228 mg/L of TDS in lake water where as

168mg/L in treated water sample. S.A. Manjare et al [5] observed a range of 100 to 455 mg /L of TDS in Laxmiwadi water sample of Kolhapur.

Total Hardness:-

Prescribed limitation for Hardness and drinking water is 300 mg /L. In our investigation we observed 228 mg /L and 172 mg/ L of Hardness. T Nirmala [8] recommends to not to use water of station S₂ and S₃ of Theni district of Tamilnadu because they Found High concentration than permissible limit i. e. 700 and 1000 mg/L respectively.

Calcium and Magnetism

We found 38.7 and 37 mg/ L of calcium where as 28.52 and 19 mg/ L magnesium in lake and treated water respectively. R. Thangdurai [7] records a range of 11.80 to 20.15 mg/L of calcium in Lake Water sample of Samutharam Lake of Tiruvannamalai district Tamilnadu.

Sulfates:-

In the present investigation, it is observed that the sulfate concentration is much lower as compared to IS 10500. We noted 128 mg/ L in lake water and 34 Mg/ L in treated water. Raval and Malik also [6] also noted sulfate values within the range prescribed by are: 10500 in total 32 located water Samples around Surat city.

Chlorides:-

52 mg/L of chlorides found in untreated water sample where as 31 mg/L of chlorides found in treated water sample. M.Sangeeta et al reported 13.4 mg/L, 59.9 and 16.6 mg/L chloride in Vallur Village water sample.

Fluorides:

Intake of excess fluorides causes dental, skeletal and non skeletal fluorosis. Fluorosis has been considered as one of the incurable disease. Hence for prevention is the only solution for the disease [3]. In the present Study the fluoride Concentration was found 0.85 mg/L in untreated water and 0.60 mg/L in treated water Sample which is within the permissible limit.

Conclusion:-

The values of Physico chemical parameter of Dam Water are ranges some what parallel to the standards recommended by ISI. Hence it needs primary or some treatment before supplying to urban Area. The values municipal water Samples shows that the plant or the treatment given to the Dam water is proper and the treated water is fit for drinking.

References

1. **APHA (1998)** - Standard methods of examination of water and waste water treatment 20th Edn. N.W. Washington D.C.
2. **D.P.Gupta, Sunita, and J.P.Sharma**- Phy-Chem. Ana. Of Grd. Water Of selected area of Kaithal city. Researcher 1 (2), 2009.
3. **Hem T.K.-Marine pollution in India, an engineering Problem Current Science (1992)**
4. **NEERI (2007)** - Guidance Manual for Drinking water Quality Monitoring and assessment (first Ed.) Pub. By: National Environmental, Engineering Research Institute, Nehru Marg, and Nagpur – 440020
5. **S.A.Manjare, S.A. Vahalankar and D.V. Muley (2010)** - Analysis of water quality using Physico – chemical parameters of Tamdalge Tank in Kolhapur District, Maharashtra Int. J. Adv. Biot. and Res. Vol. 1(2): pp 115 – 119.
6. **Raval and Malik (2010)** - Physico – chemical Characteristic of Ground water (drinking) in and around Surat city (India). J. Environ. Sci and Engg. 52 (4): 343 – 348.
7. **R. Thangdurai, K. Sivkumar and T.Ravimycin**- Monthly Var.in Samutharam Lake of Tiruvannamalai district Tamilnadu, .Asian J of Envir. Science June (2010) vol.5 No. `:19-22
8. **T. Nirmala (2010)** - Water quality assessment in Theni district Tamil Nadu, India J. Aqua. Biol. 25(1): 66 – 68.
9. **WHO (1988)** - International standards for drinking water quality vol. I, “Recommendations” World Health organization, Geneva, 130 P.