

Physico-Chemical Parameters Applied for Monitoring to Water of Sapna Reservoir District Betul, Madhya Pradesh



*^{1,2}Sandeep Rane, ²Anil Kumar, ¹Rajendra Chauhan, ²S. R. Gayakwad, ²K. Khasdeo

¹Govt. Motilal Vigyan Mahavidyala, Jahangirabad, Bhopal, Madhya Pradesh 462004, India.

²Vivekanand Vigyan Mahavidyala, Sadar Bazar, Betul, Madhya Pradesh 460001, India.

Abstract

Numerous living organisms sustaining in natural stable water reservoir water substrates have various physical properties are compulsory to where maintained ecosystem. In this research study physic-chemicals parameters such as Taste, Odour, Colour, Temperature, Turbidity, pH, Conductivity, TDS, Total Hardness, Alkalinity, Calcium, Magnesium, Chloride, Nitrate, DO, COD, BOD, Sodium, Potassium, free CO₂ realistic for analysis of water likely for supportable of life like zooplanktons.

Keywords: Ecosystem, Magnesium, Nitrate, Potassium

INTRODUCTION

In this presented research investigation to physico-chemical parameters applied for knowing status of sustainable zooplanktons in stable water of Sapna reservoir of Betul District. The reservoir has much diversity, it surrounding local zone of Tapti hills of Betul. Water is one of the most important and abundant compounds essential for all living organisms on the earth need water for their survival and growth [1-3]. As of now only earth is the planet having about 70% of water [4]. Natural water contaminates due to weathering of rocks and leaching of soils, dissolution of aerosol particles from the atmosphere and from several human activities, including mining, processing and the use of metal based fertilizer in rainy session [5,6]. Increasing population and its necessities have led to the deterioration of surface and sub-surface water [7,8]. It is difficult to understand the biological phenomenon fully because the chemistry of water reveals much about the metabolism of the ecosystem and explain the general hydro-biological relationship. Water quality can be defined on the basis of two criteria such as abiotic and biotic, consequently the water quality standards are also formulated based on this classification of water quality through estimation of various parameters under each criterion necessary that the quality of water to know details about different [9,10]. physico-chemical parameters such as Taste, Odour, Colour, Temperature, Turbidity, pH, Conductivity, TDS, Total Hardness, Alkalinity, Calcium, Magnesium, Chloride, Nitrate, DO, COD, BOD,

Sodium, Potassium, free CO₂ applied for testing of water potential for sustainable to life [11].

MATERIALS AND METHODS

The three sites selected of area according research program of Sapna reservoir of Betul District of Madhya Pradesh show in Photograph 1, where collected water samples in well sterilized bottles, from various resources water it determined sites as S1, S2 and S3 of Sapna reservoir. We have applied pre-planned analytical physico-chemical parameter for analysis of water qualities improvement. Some physical test are performed for testing of its physical appearance such as Taste, Colour, Odour, Temperature, pH, Turbidity, TDS while chemical tests are perform for its as Alkalinity, Total Hardness, Calcium, Magnesium, Chloride, Nitrate, DO, COD, BOD, Sodium, Potassium, free CO₂ and other characters.

Researcher Based

In this method research can observing phenomena on spot of research sites such as taste, colour and odour of water samples.

Instruments Based

Physical experiments temperature measured of water samples are direct by thermometer in °C,

To whom correspondence should be addressed:

Sandeep Rane

Email: biobetul84@gmail.com

conductivity are measured of water samples by electrical conductivity meter in $\mu\text{S}/\text{m}$. TDS of water samples determined through filtration and dry of sample in a petri dish at above 100°C . Turbidity of water samples measured by spectrophotometer is based on the concentration of the intensity of light scattered, fined with reference solvents. Potassium and sodium are measured by flame photometer.

Chemical based

In this methods water samples react with some specific reagents in optimum condition and titrate with special reference solutions such as total hardness, alkalinity, calcium, magnesium, chloride, DO, COD, BOD, CO_2 and in case nitrogen in measured in water samples with complex of reagents at 425nm by spectrophotometer.

RESULTS AND DISCUSSIONS

In this investigation was obtained results of various experimental data determined quality of stable water of sapna reservoir best for sustainable water for zooplanktons such as temperature was very essential of survive to living organisms in the water, controls the rate of all chemical reactions and maintained physical properties of water according of results maximum temperature 28°C of in session summer from sites S1 and S3 while in winter session 24°C from sites S1 and S2 details showed in figure 1. The turbidity of drinking water in standard form at 5-10NTU (Nephelometric Turbidity Units) is based on the concentration of the intensity of light scattered by the water sample defined by a reference suspension, showed results maximum 36NTU from site S3 of summer session while minimum 4.83NTU from site S2 of winter session details showed in figure 2.

In case properties of water have pH between 6.5-8.5 determined by WHO, it is most important in determining the corrosive nature of water. Lower the pH value higher is the corrosive nature of water. Various factors bring about changes the pH of water equilibrium is affected more due to change in physicochemical condition in this research investigation results maximum pH 7.7 from site S2 of winter session and minimum 7.3 from site S2 of summer session details showed in figure 3.

Carbon dioxide is the end product of organic carbon degradation in almost all aquatic environments and its variation is often a measure of net ecosystem metabolism in aquatic biogeochemical reaction of CO_2 is also the most

important greenhouse gas on Earth according obtained results maximum 0.6ppm from site S2 of summer session and minimum 0.05ppm from site S3 of summer session, details showed in figure 4.

In a correlation between Total hardness and TDS containing in drinking water at 500-2000ppm determined in standard form it measured as the water samples filtered through glass fibre filter in a petri dish again filter with what man filter paper and the residue retained on the filter is dried at $103-105^\circ\text{C}$. In this condition increase in dish weight represents the total dissolved solids maximum 287.67ppm from site S2 of winter session minimum 145ppm from site S3 of summer session. While Total hardness of drinking water at 300-500ppm in standard form it was determined magnesium and calcium ions complex with titrant EDTA, various mineral are content in high volume as perform hardness of water contained such as bicarbonate, chlorides and sulphites of calcium and magnesium. While calcium and magnesium with bicarbonate presence in water samples it called temporary hardness it essay removed by boiling of water. When magnesium and calcium with chloride and sulphite presence in water samples it called permanent hardness it not possible removes by boiling of water according to investigation maximum 333.33ppm from site S2 of winter session and minimum 96.67ppm from site S3 of summer session details showed in figure 5.

The alkalinity is most parameter of water standard alkalinity 20-100mg/L it determination through composed primarily in water essential from the presence of hydroxyl and carbonate ions. It is necessary to protect against corrosion of water, investigated results maximum 116.67mg/L from site S2 in summer session and minimum 23.35mg/L from site S1 in winter session details showed in figure 6.

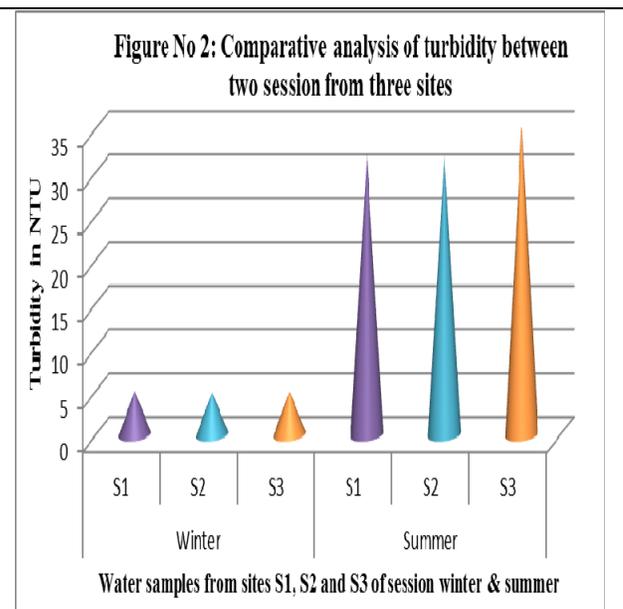
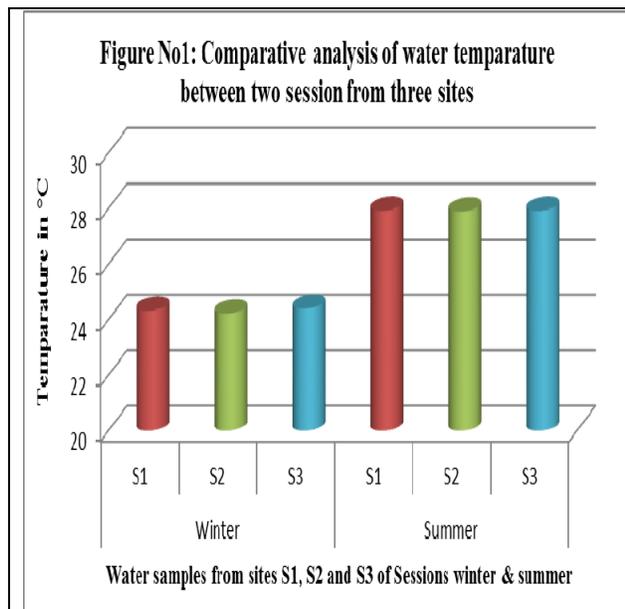
The electrical conductivity are most factor of water properties its measured in unit $\mu\text{S}/\text{m}$ with the help of EC meter which measures the resistance offered by the water between two platinized electrodes because water contain various ionic and metallic substrate in trace elements according research results maximum EC $407\mu\text{S}/\text{m}$ from site S2 of winter session while minimum EC $221\mu\text{S}/\text{m}$ from site S3 of summer session details showed in figure 7.

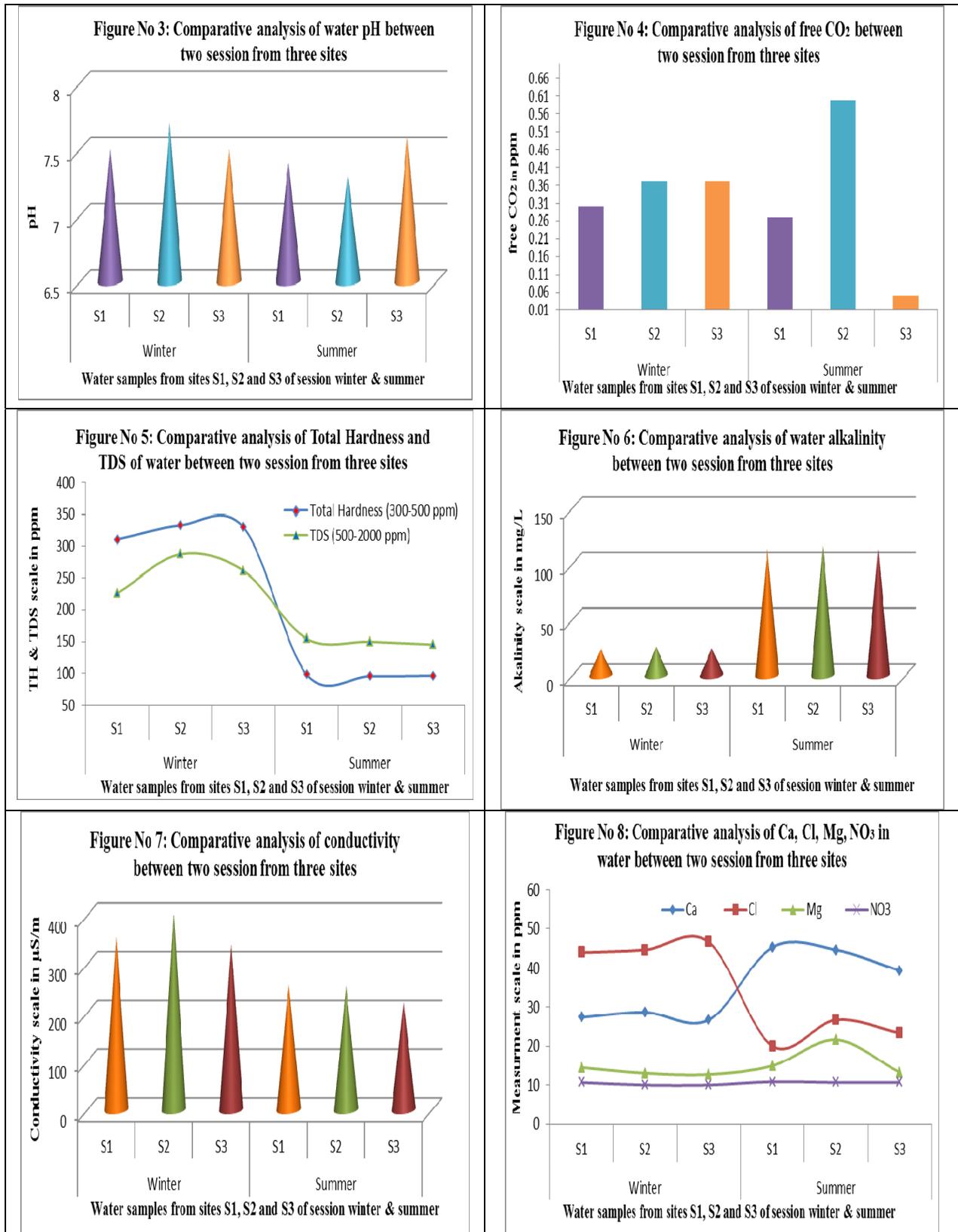
Some essential mineral elements present in water samples such as Calcium, Chloride, Magnesium and Nitrite etc. In the drinking water have standard calcium at 40-80ppm. It is measured by complex

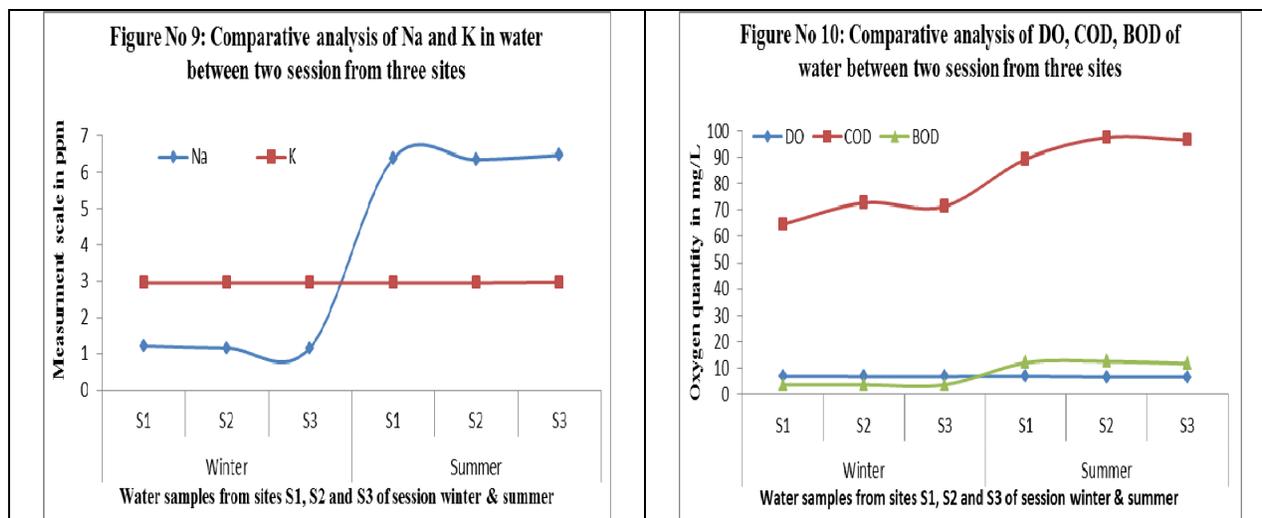
titration methods at optimum pH >12, according to results maximum 45.33ppm from site S1 of summer session and minimum 26.67ppm from site S3 of winter session. Chloride present in standard water at upto-250ppm is measured by titrate a known volume of sample with silver as soon as the chlorides are precipitated from solution, according results maximum 46.67ppm from site S3 of winter session and minimum 20ppm from site S1 of summer session. Generally magnesium contain in standard water at 20-30ppm are measured titration methods, water samples consider at pH ≈10, according obtained results maximum 21.63ppm from site S2 of summer session and minimum 12.63ppm from site S3 of winter session. Nitrate are an essential elements in mineral water at upto-18ppm in standard form obtained results maximum 10.87ppm from site S1 of summer session and minimum 10ppm from both sites S2 and S3 of winter session, details showed in figure 8.

The another trace elements such as Potassium (K) and Sodium (Na) are also measured with the help of flame photometer of distilled water and the dilution factor is applied to the observed values as maximum potassium obtained 2.97ppm from site S3 of summer session while sodium contained maximum 6.46ppm from site S3 of summer session and minimum observed 1.15ppm from site S2 of winter session details showed in figure 9.

Oxygen is very most constituent of water samples it determines such as known DO, COD, BOD methods measured dissolved oxygen in water samples, demand oxygen of standard water sample at 18mg/L, and it is one of the most important parameter and correlation with water body gives direct and indirect information of dissolved O₂ decreased due to increase in temperature, obtained experimental results maximum 7.07mg/L from site S1 of winter session and minimum 6.77mg/L from site S2 of summer session. Chemical oxygen demand of standard water at 15-105mg/L, it is ensure measure of organic material presence in water the amount of dissolved oxygen required to cause chemical oxidation of the organic material in water, obtained experimental results maximum 97.33mg/L from site S2 of summer session and minimum 64.67mg/L from site S1 of winter session. The biological oxygen demand is a measure of organic material impurity in water for the biochemical decomposition of organic complexes and the oxidation of convinced inorganic materials; it is play an important role as indicators of the environmental health of surface water according obtained results maximum 12.5mg/L from site S2 of summer session and minimum 3.73mg/L from site S1 of winter session, details showed in figure 10.







CONCLUSION

The water qualities are often considered comes at a significant for fresh water for living organisms such as zooplanktons. The various wastage residues flashing in surface water have contaminated it may be very harmful effect on water sustainable lives and may be changes ecosystem life which are native in natural stay water source, for monitoring to

qualities of water with physic- chemical properties of water.

ACKNOWLEDGEMENT

None.

CONFLICT OF INTEREST

No Conflict of Interest.

REFERENCES

- Nwali BU, Okaka ANC, Ogbanshi ME and Idenyi JN. Physic-chemical Water Analysis of Ikwo-Ihie River in Ivo Local Government Area and Ope-Ekwe River in Izzi Local Government Area in Ebonyi State, Nigeria. *Advances in Biological Research*, 2016, 10(2), 82-85.
- Sunitha M, Abhijit K, Venkataramana E. Impact of Effluents of Agro-based Industries on Groundwater Quality of Nizamabad District. *International Journal of Modern Chemistry and Applied Science*, 2016, 3(2), 341-343.
- Patil PN, Sawant DV, Deshmukh RN. Physico-chemical parameters for testing of water – A review. *International Journal of Environmental Sciences*, 2012, 3(3), 1194-1207.
- Lefort R. Down to the last drop, *UNESCO Sources*, 1996, 7, 84.
- Vivian BC, Karen F, Gerald GJE, Matthieu K, Marlina M, Eric VR, Cheo ES. Evaluating the degree of weathering in landslide-prone soils in the humid tropics: The case of Limbe, SW Cameroon. *Geoderma*, 2012, 170, 378-389.
- Geoffrey MG. Geomycology: biogeochemical transformations of rocks, minerals, metals and radio nuclides by fungi, bio weathering and bioremediation. *Mycological Research*, 2007, 111, 3-49.
- Ramesh M, Valuthi KE. Water quality parameters of ground water samples in Tamilnadu, Kerela and Pondicherry. *Der Chemica Sinica*, 2012, 3(5), 1272-1275.
- Mohan KC, Suresh J, Venkateswarlu P. Physico-chemical analysis of bore-well water of Kurnool environs, Andhra Pradesh. *Journal of Chemical and Pharmaceutical Research*, 2014, 6(9), 77-80.
- Melissa AK, Ariana ESG, Robert FS, Susan EG. Benthic macro-invertebrates as indicators of water quality: The intersection of science and policy. *Terrestrial Arthropod Reviews*, 2009, 2, 99-128.
- Agrawal A, Pandey RS, Sharma B. Water Pollution with Special Reference to Pesticide Contamination in India. *J. Water Resource and Protection*, 2010, 2, 432-448.
- Kumar A, Bhawsar NG, Khandelwal S, Sakir SS, Ahuja S, Pathak M, Hanote RK, Gayakwad SR, Khasdeo K. Physico-Chemical Parameters Apply to Analysis of Drinking Water From Some

Sandeep Rane et al., Physico-Chemical Parameters Applied for Monitoring to Water of Sapna Reservoir District Betul, Madhya Pradesh

Selected Area of Betul District, Madhya Pradesh. *International Journal of*

Pharmaceutical, Chemical and Biological Sciences, 2013, 3(4), 1109-1114.