



Short Review Paper

Hydro biological studies of surface and ground water of the Indore city; a Comprehensive Review

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Abstract

Water is a precious commodity. Hydrobiology deals with the details of various forms of aquatic life such as algae, Phytoplankton, zooplanktons, fishes and other groups of living organisms. Water resource is an essential ingredient for human survival. The availability of safe drinking water is important for proper growth of human being. The consumption and utilization of water resources raise some environmental issues. The major one is how far the quality of water used for domestic purpose is safe. Secondly, how the country's water resources will meet the demand of rapidly growing population. The first issue is a major environmental problem causing serious human suffering, as maximum percentage of water used for drinking and domestic purpose is unsafe for human consumption. The study of surface and ground water of the Indore city is integral to the present research, a comprehensive review of research works on such components in different parts of the world was essential.

Keywords: Hydro biological, Phytoplankton, Physicochemical, Domestic, surface and ground water.

Introduction

Hydrobiological studies give humans a deep insight into the principles of life; its forms and levels of existence and immortality on crust. Ecology reveals to us the truth that there is only "one life" on earth. Life exists infinitely in interrelations of diverse species in space and time. Ecology provides us with the wisdom that the supremacy and freedom, which humans enjoy over the diverse forms of life, are subject to the limits of nature's constitutions¹. Fresh drinking water sources are most important to crust earth: they are the common ingredient to life. Increased demands on the resources have impacted highly on natural aquatic ecosystems. Fresh and clean water is limited in quantity indicates the need for comprehensive water management².

The very early information on aquatic environment in literature had little scientific value. With the advanced of time, knowledge about the aquatic environment increased and simple fresh water phenomenon was explored. Later the invention of microscope greatly influenced the scientific study of microorganism. The aquatic environment attracted the attention of researchers and environmentalist to study the relationship of living and non living environments, thus the science of ecology came into existence. The analysis of fundamental features of nature water is therefore an essential approach to understand the interrelationship. Most of the physical and chemical features invariably have significant influences on the aquatic life. The natural water has become a matter of great public concern not only because of the treat to public water supplies but also

because of the drainage caused to natural ecosystem. The nature water tends to get degraded to get human activities. Present study is concerned with fresh water biology, including physico-chemical studies.

Hydro biological studies

Physico-chemical properties of natural water body (like river, lake, pond etc), their spatial distribution and variation in time provide a lot of information about the ecosystem. Evaluated physicochemical characteristics of Ami river water³. Assessed the overall water quality of Tirupati⁴. Water quality had studied of Ganga river at Kannauj and Fatehgarh U.P., India⁵. Determined pollution load of Kerwan Dam water at Bhopal during pre monsoon season⁶. The effect of seasonal variations on physical and chemical characteristics of The Indus river water⁷. Acidification of surface water in central of India⁸. The physicochemical characteristics of ground water of Korba city, Chhattisgarh, India⁹.

Comparative study of drinking water quality of residential sources in Municipal Corporation. Performed by Tiwari et al.¹⁰ great variation in water quality was observed. Total Hardness as CaCO₃ was found to be more in bore well and deep tub well water than samples from Rukha Dam supplying tap water and PHED supply water in SAIL Satellite Township was investigate for the evaluation of fluoride contamination in Sambher block of Jaipur district. Results were compared with standards as prescribed by ISI and WHO¹¹.

Limnological study on pond of Natnagra (Dhar) to physical and chemical characters, was done by Dhakad N.K. and Chaudhary P.¹². In study observe the pond water is ready for drinking purpose after filtration process due to the huge availability of coli forms. Studied physical and chemical parameter of an ancient but popular fresh water lake 'Ana Sagar' Ajmer, Rajasthan¹³. The result shows in the study of that pond is contaminated and its water is Alkaline, Nitrate and phosphates are high in comparison to standard limits.

Physico-chemical parameters indicate the pollution of Narmada river in Hoshangabad city, ecosystem due to domestic dug waste, municipal sewage waste, industrial effluent from Security Paper Mill (SPM) and agricultural run-off that influence the water quality directly or indirectly¹⁴. Analysis determination of fresh water on city of Kolhapur was analyzed two years from different weather by Lomate V. et al.¹⁵ results show in the analysis period were used to correlating the fresh water filtration technique in the filter homes.

The pH of water was alkaline throughout the lake and both pH and salinity varied widely. Higher pH with low salinity zones reflected disintegration of submerged weeds, such studied done by Nayak et al.¹⁶ and Nageswara Rao V.V. and Prapurna N.¹⁷.

Turbidity has found in a range of 2.0 to 102.0 N.T.U. in tube well water of Bhopal city¹⁸. The seasonal variation in underground water quality had analyzed at Gwalior and observed that various parameters exceeded the permissible limit prescribed by WHO¹⁹. Analyzed the presence of metals in fresh drinking water from different main sources like Mohanadi river, Taladanda water, tap water, bore well and open well water in port city of Paradeep and found the seasonal fluctuation²⁰.

The pH, conductivity, temperature and nitrates appear to be closely related to Diatom development²¹. Investigated physical and chemical characteristics of Lake *Atnsjoen*, Norway²². According to Ojha P. and Mandloi A.K.²³ pH increases in water bodies from morning onwards and decline during evening as temperature decreases. They also noticed that turbidity; suspended matters, clay, silt, colloidal organic particles, plankton and other microbes are an expression of light scattering and absorbing properties of water. Radhika et al.²⁴ reported that water temperature is enormous significance as it regulates various abiotic as well as biotic activities of an aqua system. This perusal of literature on ecological investigations of water bodies showed that long-term monitoring and comprehensive analysis of the physico-chemical parameters is crucial to a holistic approach in solving environmental problems of such systems.

Monitored the groundwater quality from shallow aquifers of Hisar city²⁵. The results showed that water was moderately to highly saline at most of the studied locations. Evaluated the groundwater quality in and around Deogarh, results of Physico-chemical parameters indicated that the water of that area was

found to be suitable for both domestic and irrigational purposes²⁶. Observation from study on quality of groundwater in Jind city of Haryana TDS, total hardness, total alkalinity and fluoride of most of samples was higher than permissible limit. Nitrate content was also observed to be higher than maximum permissible limit in some freshwater samples, according to Mor et al.²⁷ and Garg et al.²⁸.

Studied groundwater quality variation in Bhilwara district²⁹. From the study it is clear that overall quality of groundwater in the district was deteriorated. TDS total hardness and chloride concentration in all sources were increased while the concentration of fluoride and nitrate was fluctuating in the district^{30,31}.

Conclusion

The degree of pollution is assessed generally by studying physical and chemical characteristics of the freshwater body. Any undesirable change in the physical chemical characteristics of water brings about water pollution. This change is mainly due to human activity such as rapid urbanization and industrialization coupled with injudicious exploration of natural resources. The discharge of domestic waste and industrial effluents into natural water resources such as rivers, streams as well as lakes and reservoirs results in alteration of their physical and chemical properties leading to objectionable condition. The assessment of ground water by physical and chemical analysis could help in understanding the extent of ground water pollution by surrounding human activities. Thus the physico-chemical parameters changed in surface and ground water samples due to above discussed many reasons their seasonal fluctuation and variation depends open availability of water.

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