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## Impact Of Physicochemical Parameters From Sewage Effluents On The Quality Of Fresh Water From Sina During Monsoon Season

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### **Abstract:**

Environmental related problems are created or originated due to the industrial development and different anthropogenic activities. Due to industrial waste and sewage effluent natural resources of water get polluted. Textile industries are principal sector of Solapur city, as it requires large quantity of water for different uses like dyeing, bleaching, washing, printing etc. Hence these industries produce large amount of waste water that is effluent. present study assess the physical parameters and chemical parameters of sewage effluent because this sewage water is drained in to Sina river without proper treatment and also used for the agriculture purpose physical and chemical parameters like pH, temperature, dissolved oxygen, biological oxygen demand, chemical oxygen demand, total dissolved solids etc. were analyzed during monsoon season. Present study revealed that, the levels of various physico-chemical parameter were above the permissible limits of WHO. .

**Key words:** Water Pollution, COD, BOD, Solapur, Effluent, Physico-chemical parameter

### **Introduction**

Life was first arise in water that means water is basic need of every organism. Major consideration for industrial and technological development, Drinking water is also used for aquaculture irrigation, fish culture, hydropower generation but water elixir of life becoming more unfit due to mismanagement, Magardey, et.al. (2009). In India mostly industries are situated along river bank for availability of water and disposal of waste water Lokhande, et. al (2011) and Kumar A. (1996). For the industrial waste water disposal main source is surface water, these untreated waste water may increase the pollution level of surface water 20 times than safe level almost all rivers are get polluted by industrial waste, sewage water. Modak, et al. (1990) and Lokhande, et al., (2011). Indian industries function under the guidelines of CPCB (Central Pollution Control Board) different norms and guidelines are given for all industries depending

upon their pollutants most industries have treatment plants but small scale industries do not have treatment facilities for their effluents because they cannot afford investment in pollution control equipment .As result in India there are sufficient evidence present related with mismanagement of industrial waste Rajaram and Das (2008) and Singare, et. al.(2010).Sewage water is containing more than 80% of industrial waste run off through rainfall, agricultural runoff etc. And it is poured or drained in to Sina river. Major problem of Sina river is pollution from industries situated near bank of river like sugar factories and textile industries from Solapur city which are not well established sewage treatment plants due to this the waste effluents from these industries are carried through sewage system and inflow of sewage from all city and adjoining areas from where the new colonies are developed without proper network of sewage system and sewage generated from these areas are directly discharged into Sina river it results in to the depletion of oxygen concentration and biological oxygen demand and chemical oxygen demand is resulted very high. siltation of the agricultural activities is also responsible for the pollution

### **Material and Methods**

#### **Study region**

The present study was conducted in sewage nala (Sewage Chanel) of Solapur city. This nala runs throughout city with different name like Sheligi nala ,Lendaki nala, Chwoda Kaman nala etc. City nala is passes Akkalkot road MIDC where most of textile industries are situated and their waste water drained into sewage. In many places sewage water is used for cattle washing, for agricultural purposes.for the analysis of physical parameters and chemical parameters four sampling stations (S1,S2, S3 and S4) were selected. Samples were collected in 2 lit Plastic containers between 9am to 10.30 am in monsoon season different physical and chemical parameters were analyzed like Temperature, pH, Conductivity, Dissolved Oxygen, Chemical Oxygen Demand, Biological Oxygen Demand, Total Dissolved Solids. temperature of sewage water measured by mercury thermometer at site, pH also measured at site with help of portable pH meter. With the help of conductivity meter sewage water conductivity is measured. Turbidity of water is occur due to the suspended materials, silt, water runoff from nearby areas etc. Dissolved oxygen is measured by Winkler's method Golterman, et al. (1978). Total dissolved solids measured by Gravimetric method, it expressed in mg/lit. Trivedy & Goel (1984).biological oxygen demand was analysed by subtracting the value of final concentration of dissolved oxygen from initial concentration of dissolved oxygen Vandana Magarde, et., al.(2009). Chemical oxygen demand was analyzed by Dichromate reflux method.

**Results and Discussion:****Table No. 1: Station wise level of different physico-chemical parameters during monsoon**

Physical & Chemical parameters	S1	S 2	S3	S4
Temperature (° c)	24.3	25.0	24.0	25.3
pH	7.1	7.4	7.0	7.1
Conductivity(µmhos/cm)	262.4	253.2	256.4	269.2
Turbidity (Hz)	282.3	282.8	280.8	284.9
Dissolved Oxygen ( ml/lit)	2.5	2.9	2.7	2.9
Total Dissolved Solids (mg/lit)	1788	1814	1680	1979
BOD (mg/lit)	93	89	98	152
COD(mg/lit)	365	523	560	653

Temperature may affect the aquatic ecosystem or aquatic environment. Increase and decrease of water temperature is depending on the atmospheric temperature. Evaporation is high in high temperature it also affects on the density of water it may also affect on the amount of dissolved oxygen in water. Temperature ranged between 24°C to 25.5 °C during monsoon season temperature of sewage water is recorded at site 1 is 24.3°C, at site 2 25.0°C, at site 3 24.0°C and at site 4 25.3°C. Maximum temperature was recorded at site 4. Concentration of hydrogen ion may indicate the alkalinity of water as well as acidity of water. High pH is related with photosynthetic activity and high rate of photosynthesis can be related to the higher concentration of plant nutrients and it indicates the pollution of aquatic system Bajpai, et.al. (2001).in present study pH ranged between 7.0 to 7.4. Organisms of aquatic ecosystem may be affected due to pH of water because metabolic activities of aquatic organisms are depend on pH of water. Salinity of water can be indicated by pH high pH or low pH 166 l aquatic organism and human being.

Electrical conductivity is important parameter it is depend on the weight of waste water, polluted water is good conductor due to presence of acids, salts etc. In present study electrical conductivity is ranged between 253.2µmhos/cm to 269.2µmhos/cm. High conductivity was recorded at site 4 it may be due to addition of detergents, salts in sewage water. Electrical conductivity can indicate the dissolved solids in water because concentration of ionic species determines the conduction of electrolyte current. Due to different types of suspended material, industrial waste, runoff from nearby areas water became turbid mostly in monsoon season particularly silt, clay and sewage affect. Production of plankton is mainly affected due to turbidity.

Productivity of fish and phytoplanktonic growth is affected due to level of dissolved oxygen. Dissolved oxygen is very important and most essential in water. Low concentration of dissolved oxygen may be due to the high load of organic material. Continuous introduction of effluents in water may support the growth of aquatic weeds and floes formed on water surface and due to this reduction of dissolved oxygen take place. Morrison et al. (2001).in present study dissolved oxygen is ranged between 2.5ml/lit to 2.9ml/lit.

Biological oxygen demand is ranged between 89 mg/lit to 152 mg/lit in present study. High biological oxygen demand means domestic waste is added in water. Textile effluents discharged in water and it affects the aquatic ecosystem. Biological oxygen demand indicates the organic matter decomposed in water. Dead plants, dead animals, debris, animal manure etc. is the source of biological oxygen demand in water. High biological oxygen means water is polluted. The low biological oxygen demand during monsoon attributed to dilution of water Upathdya and Rana (1991).organic matter is high in water it increase the biological oxygen demand and dissolved oxygen is reduced and relatively it affect on fitness of natural population of fish and quality of water, Adewoye,et al., (2005).Load of organic and inorganic waste from sewage and textile industries measured by chemical oxygen demand. Value of chemical oxygen demand in present study was ranged between 365mg/lit to 653mg/lit. Chemical oxygen demand and biological oxygen demand act related purpose that to measure oxygen consumption capacity of water during decomposition of organic matter and oxidation of inorganic chemicals. Permissible limit of chemical oxygen demand for agriculture and irrigation and discharged in to river is 250mg/lit ISI (1995).

Problem of water pollution is present in all over. Water pollution problem is occur in developed countries as well as developing countries. Sewage disposal is major concern in most urban areas of Zimbabwe, waste water from industries and sewage released into streams and rivers which finally discharged in to dams. Dube Trevor, et.al. (2010).

Due to mismanagement and lack of awareness towards water conservation, environmental pollution produced many disorders related to human being. Physical parameters and chemical parameters of sewage water from Solapur city are above permissible limit and hence their must be treatment plant before this water is drained in to Sina river is essential.

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