RESEARCH PAPER:

Physico-chemical characteristics of leather tannery effluent- current scenario in Dindigul town (Tamil Nadu), India

■D. SARALA THAMBAVANI AND V. PRATHIPA

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SUMMARY

Effluent of tannery samples were collected from leather tannery at dindigul town and analyzed bimonthly for a period of 6 months (October 2010 - March 2011) in order to understand various physical and chemical characteristics of the sample effluents. The parameters measured were temperature (26.95c), pH(6.7), turbidity (434 NTU), electrical conductivity (28935 µs/cm) , BOD (2600mg/l), COD(5083mg/l), DO(1.37mg/l), total hardness(2653mg/l, alkalinity(1330mg/lit), total dissolved solids(19713 mg/l), calcium(561 mg/l), magnesium(294mg/l), sodium(4388mg/l), potassium (901.7mg/l), iron (3.14mg/l), chromium (194mg/l), nitrate (47mg/l), chloride (8360mg/l), fluoride(1.45mg/l), sulphate (966mg/l) and phosphate (2.9mg/l). According to the permissible level suggested by Bureau of Indian standard, all the water quality parameters in the tannery effluents were found to be very high and well above the permissible limits. Ratios like sodium absorption ratio(SAR), Kelley's ratio KR, per cent sodium (PS), magnesium ratio(MR) and Wilcox ratio(WR) were well above the prescribed limits. It is concluded that tannery effluents was highly polluted as it exceeded the prescribed limits for irrigation and public use.

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Key Words :
Physico -chemical analysis, Biological oxygen demand, Chemical oxygen demand, Dissolved oxygen, Water, Tannery effluent

Author for Correspondence -
D. SARALA THAMBAVANI,
Shi Meenakshi Government Arts College For Women (Autonomous), MADURAI (T. N.) INDIA

See end of the paper for **Coopted authors**

The developed countries have used to exploit every bit of natural source to convert them into goods for their comforts to export them to needy developing countries. In doing this, the industrialized countries dump a lot of materials in their environment which become polluted (Dalela, 1985). Due to industrialization and urbanization, the availability and quality of drinking water resources is decreasing day by day. The requirement of water in all forms of lives, from micro-organisms to man, is a serious problem today because all water resources have reached to a point of crisis due to unplanned urbanization and industrialization (Singh *et al.*, 2002). Tanneries, oil refineries and metal industries are causing depletion of surface and water quality (Raj *et al.*, 1996). The discharge of various sub processes of tanneries like bathing, pickling, tanning, dyeing and fat liquoring may cause water pollution severely. The pollution of a particular water body can always be linked to an industry or sewage or agriculture(Subramanyam and Sambamurthy, 2006). The constituents that are present in raw waste water can be classified as physical, chemical, biological (Qasim, 1999) and toxic compounds. The problem of environmental pollution on account of essential industrial growth is the problem of disposal of industrial water, whether solid, liquid or gaseous. All three types of wastes have the potential of ultimately polluting water. Polluted water in addition to other effects, directly affects soil not only in industrial areas but also in agricultural fields, as well as the beds of rivers, creating secondary source of pollution (Kisku *et al.*, 2000 and Barman *et al.*, 2000).

The leather industry is an important foreign exchange earner for India. The states of Tamilnadu, West Bengal and Uttar Pradesh together have 88 per cent of the tannery units of the country. Tanners use a large number of chemicals during the process, discharging toxic wastes into the rivers and degrading agricultural land. All of the 68 tanneries in Dindigul, Tamilnadu are situated within a 5 km distance from the centre of the town. Several of them have been in existence for thirty to forty years. Effluents from the tanneries are discharged into streams which drain into ponds, thereby polluting the ground water sources and cultivable lands.