

## **Characterization of wastewater generated by a textile industries**

The cost of treatment for the textile wastewater treatment facility has been escalating fairly rapidly in recent years. Hence, search for more efficient & effective treatment techniques as well as the maintenance of existing wastewater treatment plants to an efficient level are the major. The objective of this study was to characterize the wastewater treatment facility in a selected textile industry with a view of monitoring the effectiveness & efficiency of wastewater treatment plant. Studies were also carried out to isolate & identify the microbial consortium in the aerobic system of the wastewater treatment facility.

The analysis was carried out through the periodical collection & evaluation of the samples for the combination of different physico-chemical & biological parameters including color, temperature, pH, DO, TSS, BOD, COD, MLSS, SV30, SVI & F/M ratio. The studies of the bacterial consortium was based on its isolation & identification and its growth on various media, containing textile dyestuff. The enumeration of bacterial population was carried out by using the plate count agar as the medium. Biodegradability of isolated bacterial consortium was measured according to method given by Ogawa et. al, 1978.

The samples, collected from the oxidation ditch of the wastewater treatment facility has a microbial consortium, consisting of *Bacillus* spp., *Pseudomonas* spp., *Enterobacter* spp., & *Actinomyces* spp. The predominant species was *Bacillus* spp. In the oxidation ditch, the BOD values ranged from 74 mg/L to 264 mg/L & the COD values ranged from 182 mg/L to 496 mg/L. The DO content, MLSS and F/M were in the range of 1.8 mg/L - 4.7 mg/L, 920 - 3784 mg/L & 0.03 - 0.27 (mg BOD per day/mg MLSS) respectively. Aerobic bacterial population in these samples varied from  $5 \times 10^3$  -  $86 \times 10^3$  CFU/mL. The efficiency of the oxidation ditch in terms of BOD reduction was ranged from 75% - 91% & COD reduction was 53% - 82%. The reactive red dye commonly used by the textile industry was not effectively adsorbed & degraded by the microbial consortium in the aerobic system. This dyestuff remains as a residual color in discharged effluent. However, pigmented (direct) dye (blue color) was well adsorbed to the bio-sludge. The laboratory experiments carried out with standstill cultures indicated that some microorganisms present in the facility could degrade the reactive red dye under given conditions.