

RESEARCH PAPER:

Flocculant effect of *Aloe vera* L. in removing pollutants from raw and treated dye industry effluent

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SUMMARY

Effluent from dye industry is the most polluting of all industrial effluents. The biological treatment seems to be the most reliable method for the disposal of pollutants. In the present study an attempt has been made to evaluate the pollutant removal efficiency of *Aloe vera* from different concentrations of raw and treated dye industry effluent. *Aloe vera* remarkably reduced the TDS, COD, BOD and chloride in all effluent concentrations of both raw and treated dye industry effluent.

Key words :

Aloe vera, Dye industry effluent, Flocculant, Biological treatment

Environmental pollution has become a global concern. Increasing pace of industrialization in public and private sectors along with population explosion, urbanization and green revolution are reflected in varying degrees of the purity of water, soil and air. So, the industrial growth has brought along with it new problems too. The current conventional engineering and mechanical methods of industrial waste treatments are quite expensive and thus are uneconomical for industries of low turnover rates. In recent years, there has been an increased interest in alternate and innovative technologies which will prove low-cost, low maintenance and energy efficient. The physical treatment method like flocculation gains significance for the removal of colour which is not amenable to bio-degradation (Calley *et al.*, 1977). *Aloe vera* contains mucilaginous substance rich in albumin. This albumin flocculates on heating and floated on the surface along with the strangled impurities.

Thangamuthu (1991) reported that *Aloe vera* extract can be used as a flocculant in clarifying cane juice. Increased sedimentation and recovery of algal biomass grown on food processing industry effluent using *Aloe vera* as flocculants. Taking these points into account, an investigation was carried out to evaluate the flocculant effect of *Aloe vera* for the treatment of dye industry effluent.

MATERIALS AND METHODS

Fresh *Aloe vera* plants were collected at

Palakkattur, Erode and in the laboratory fleshy mucilaginous tissue was scooped out by removing the epidermis. 100g of tissue was added to each dilution (20 %, 40%, 60%, 80%, and 100%) of raw and treated dye industry effluent at boiling temperature. Initially 100ml sample was withdrawn from each dilution and analyzed for its physico-chemical characteristics like colour, pH, EC, TDS, COD, BOD etc. (APHA, 1995). After the retention period (one day), 100ml of biotreated sample was withdrawn from each dilution for analysis of physico – chemical parameters and the data were recorded and statistically analysed.

RESULTS AND DISCUSSION

Results of physico-chemical characteristics of raw and treated dye industry effluent and biotreated effluent (*Aloe vera* treatment) were recorded (Table 1, 2, 3 and 4). The colour of biotreated effluent changed to light brown to pale brown at 40% and 20% concentrations, respectively. Nasr *et al.* (1975) has suggested pH 5 for maximum colour removal. But in the present study colour removal occurred at neutral pH.

The flocculation process reduced maximum COD in the raw and treated effluent. The same result was obtained by Slavik *et al.* (1999) who stated that contaminants in water are usually removed by flocculation. *Aloe vera* treatment removed colour and BOD efficiently. The findings are conformity with the results of Milstein *et al.* (1987). The reduced BOD in all

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