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Performance analysis of different textile effluent treatment processes involving marine diatom *Odontella aurita* 

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## ACCEPTED MANUSCRIPT

## Performance analysis of different textile effluent treatment processes involving marine diatom *Odontella aurita*

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9 ABSTRACT:

This study investigated the efficiency of different treatment processes in the removal of 10 pollutants from Raw textile Effluent (RE) collected from Common Effluent Treatment Plant 11 (CETP), Perundurai, Tamil Nadu, India. The maximum decolourization was achieved in 12 chemical process (90% with H<sub>2</sub>O<sub>2</sub>), followed by physical (85% in electrocoagulation), and 13 Lysinibacillus sphaericus SK bacterial (84%) involving 13) treatment 14 processes. Phycoremediation involving marine diatom Odontella aurita demonstrated least decolourization 15 (65%). Physical treatment showed better reduction in turbidity (93%), bacterial treatment could 16 significantly reduce BOD (84%) and COD (88%), while phycoremediation could effectively 17 remove metal ions. Individual treatment process was unable to reduce effluent parameters 18 complying with the water discharge limits. So combination of different treatment processes has 19 been investigated for remediation of RE with higher efficiency. The integration of chemical -20 21 phycoremediation demonstrated maximum removal of colour (95%), turbidity (99%), BOD (86%) and COD (90%). Further it was estimated that the recovery of water after a treatment 22 process (treated wastewater) was 93 % and sludge production was 0.2 g/ L, when compared to 23 the current CETP process which recovers 85% treated wastewater and produces 1.4g/L of 24 sludge. This combined chemical and phycoremediation processes showed greater promise when 25 compared to the treatment methodology followed at CETP, in obtaining treated effluents that 26 meet the discharge limits further reducing the production of sludge as secondary pollutant. 27

Keywords: Textile effluent, Bioremediation, Advanced Oxidation Processes,
Electrocoagulation, Lysinibacillus sphaericus SK 13, Odontella aurita

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