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Screening of fresh, dried, activated and non-activated macro alga *Ulva* (Ulvaes Chlorophyta) for their ability to remove methylene blue dye from aqueous solution

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The main objective of the present study is to effectively compare the potential of different chemically and pyrolytic modified fresh and dried biomass of *Ulva* sp. by using it as an adsorbent. Methylene blue (MB) was used as a model molecule in aqueous solution for evaluating the potential of modified biomass as a bio-sorbent. The modified biomass was characterized by SEM, TEM, EDX and FTIR to understand the biosorption mechanism. The equilibrium studies were carried out by variation in different parameters, i.e., pH (2-10), bio-sorbent dosage ($1\text{--}10\text{ g L}^{-1}$), contact time (0-120 min). MB removal was greater than 90% in neutral pH at low dosage of chemically modified bio-sorbent compared to pyrolysis treatment and non-activated biomass at acidic pH. The optimum result of MB removal was found at 4 g L^{-1} activated and non-activated biomass dosage. Biomass removes 87% dye in 15 min under static conditions and nearly 95% in 75 min when agitated at 150 rpm. MB biosorption by all chemically modified follows pseudo-second order kinetics except pyrolysis treatment. Correlation coefficient values of most modified biomass were close to unity which suggested that adsorption data were in favor of Langmuir. The highest adsorption capacity was found 625.00 mg g^{-1} at 16.00 mg L^{-1} initial MB concentration. The process attained equilibrium in 75 min. The results revealed that *Ulva* is an ecofriendly proxy for wastewater treatment.

Biography

Taghreed Alsufyani is an Assistance Professor of Bio-organic Chemistry, Taif University, Saudi Arabia and received her Bachelor's and Master's degrees from King Abdulaziz University, Jeddah, KSA in 2006. Further, she joined Chemistry Department at Taif University where she got a Scholarship to join PhD program at Friedrich Schiller University Jena, Germany under the supervision of Dr. Thomas Wichard. Later, she went back to Taif University and started working as an Assistance Professor. Since 2015, she has established The Algal Research Laboratory and began her investigation of algal chemical ecology as well as the applications of algae in biotechnology processes such as water treatment and bioenergy production.

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