

OBJECTIVES OF THE PRESENT STUDY

Based on the current state of the textile dyes, effluents and their environmental tribulations, the present study aimed to utilize bioremediation approaches to benefit the environment using brown marine macroalga, *Sargassum wightii*. The present study was undertaken to explore the biosorption potential of macroalgal biomass for the removal of BG dye and effluents from aqueous solution and to study the applicability of their commercial use and their significance with the following objectives:

The objectives of the present investigation are

- To investigate the feasibility of *Sargassum wightii* for the removal of BG dye from aqueous solution.
- To determine the different environmental factors on decolourisation with varying dye concentrations, adsorbent dose and pH at different temperatures.
- To determine the variations in the functional groups using FT-IR spectroscopy, the surface characterization by SEM, the elimination of metals before and after biosorption using EDX.
- To determine the equilibrium uptake (q_{eq}) and adsorption yield of *S. wightii* as a function of initial pH, initial dye concentration and temperature for the removal of BG dye.
- To analyze the experimental adsorption data using Langmuir and Freundlich adsorption isotherms and determination of isotherm constants.
- To evaluate the kinetics of the adsorption process using pseudo first and second order rate equations.
- To state thermodynamics to explain the adsorption process.
- To analyse the physico-chemical parameters of dye before and after treatment by *S. wightii*.
- To check the feasibility of *S. wightii* for the removal of real textile effluents from aqueous solution.