



ASSESSMENT METHODS USED IN DETERMINING THE BIOREMEDIATION POTENTIAL OF MICRO ALGAE IN TREATMENT OF INDUSTRIAL EFFLUENTS: A REVIEW

¹S. V. Hajare and ²A.A. Kulkarni

^{*1}Mahatma Phule Mahavidyalaya Pimpri, Pune-17.

²BPHE Society's Ahmadnagar College, Ahmadnagar

Email: swapanahajare@gmail.com

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ABSTRACT:

Bioremediation is a process used to treat contaminated media, including water, soil and subsurface material by altering environmental conditions to stimulate growth of microorganisms and degrade the target pollutants. With the growing industrialization and urbanization, organic pollutants are accumulated in the aquatic ecosystem and fresh water bodies through the industrial discharges, untreated domestic effluents, agricultural runoff which includes pesticides, herbicides and fertilizers. These are responsible for adding excess nutrient load and change the quality of water and also causes negative effects on aquatic ecosystem as well as organisms which are depend on it. Similarly heavy metals, radio nucleotides which are released into the land and water reservoirs through nuclear power plants in accidental cases and their long term exposure to humans is detrimental as they are carcinogenic. There are several conventional methods such as coagulation and filtration, chemical precipitation, carbon adsorption, ion exchange, evaporations and membrane processes to minimize these contaminants but they might be including improper handling, disposal problem of sludge and high capital cost. Use of algae to minimize the contaminants or to detoxify the polluted water bodies is a more promising, ecofriendly and cost-effective method also known as phycoremediation. In this current review we will highlight on various methods used to assess the bioremediation potential of some micro algae in treatment of industrial effluents.

Key words :- Industrial effluents, heavy metals, microalgae, bioremediation assessment methods.

INTRODUCTION:

Now a days increasing population, urbanization and industrialization results in to environmental pollution which become a serious problem to the humans, animals and also terrestrial and aquatic life. Major natural resources like soil, water and air are contaminated by various anthropogenic activities. These activities include waste discharge from industrial processing, such as petroleum refinery, mineral mining, and chemical manufacturing, and agricultural activities. Most of these waste materials are released into the water reservoirs like sea, river, lake, pond, etc. These wastes mostly contain organic material in the form of N and P which add nutrient load into water reservoir leads to eutrophication,

uncontrolled spread of certain aquatic macrophytes and oxygen depletion. Eutrophication increases the biological oxygen demand and alters the pH of water and makes it unhealthy for aquatic life (Amin et al., 2008). Many industries like electroplating, tanning, paper, textile etc. are main reasons of discharging effluents causing heavy metal pollution. Heavy metal pollutants like Mercury (Hg), Cadmium (Cd), Chromium (Cr), Lead (Pb), Nickel (Ni) and Zinc (Zn) causes poisoning which can occur through drinking water or intake via food chain. These heavy metals accumulate in the food chain of aquatic and terrestrial ecosystem posing health hazards (S.S. Ahluwalia and D. Goyal, 2007). Similarly, soil contamination and remediation of

