Chapter 7
Algae-Based Treatment Systems for Nutrients Removal From Industrial Effluents

Ravi Berwal
Guru Jambheshwar University of Science and Technology, Hisar, India

Himanshi Tanwar
Guru Jambheshwar University of Science and Technology, Hisar, India

ABSTRACT

Industrial wastewater, whether treated or untreated, that exits a sewage treatment plant or is released from industrial facilities is generally referred to as industrial effluent. There are many types of industrial effluent like pharmaceutical wastewater, chemical wastewater, wastewater from textile, electronic industries. Based upon the type of industries, effluent may contain different types of nutrients like sulphur, phosphorous, nitrates. The nutrients can be recovered by various techniques like physical, mechanical chemical, biological. The biological methods have its own advantage like use of microorganism and it is most effective at low cost. Algae based treatment utilizes algae to remove excess nutrients from industrial effluent. It exhibits its application in the field of wastewater treatment plants, biofuels, nutritional supplement industries, agriculture, pharmaceutical and cosmetic manufacturing units. This chapter is aimed on industrial effluent and its treatment using various methods.

DOI: 10.4018/979-8-3693-8487-9.ch007

INTRODUCTION

Industrial wastewater, whether treated or untreated, that exits a sewage treatment plant or is released from industrial facilities is generally referred to as industrial effluent. Raw industrial effluents can be either organic or mineral-based, and they can be distinguished by a high concentration of organic (and/or mineral) compounds. This can happen because of a large number of molecules with a very low concentration, such as those from the food or pulp and paper industries, or because of a few major pollutants, like chemical industry effluents. In the event of an incident, raw industrial wastewater may also contain other liquid wastes, such as washing residues and occasionally process water (Anjaneyulu et al., 2005). Raw industrial wastewater is often created continually during the industrial process. These factors lead to variations in the quality and, naturally, the associated pollutant load of all industrial effluents. Rapid industrialisation has resulted from rising demand for commodities brought on by the growing population. Consequently, as industrial setups have grown, so too has the amount of industrial waste produced. Due to their pollution of the soil, water, and air, these industrial wastes seriously harm the environment (Saravankumar et al., 2022). Depending on these sectors, wastewater can have a variety of contents, including biodegradable materials like paper, leather, and wool as well as non-biodegradable waste such as heavy metals, pesticides, and plastic. Wastewater from industries may be combustible, reactive, poisonous, or carcinogenic. Therefore, the discharge of garbage into water bodies can have disastrous repercussions on the environment and human health if adequate treatment and management procedures are not followed (Gaur et al., 2020).

TYPES OF INDUSTRIAL WASTEWATER

Industrial effluents are wastewater or liquid waste generated from various industrial processes. They can vary widely in composition depending on the type of industry and the processes involved. Here are some common types of industrial effluents:

Chemical Wastewater

This includes effluents from chemical manufacturing, which may contain a range of chemicals, including acids, bases, solvents, and various organic compounds.