

## **A recent overview of palm oil mill effluent management via bioreactor configurations**

*Supriyanka Rana; Lakhveer Singh; Zularisam Wahid; Hong Liu*

Faculty of Engineering Technology, Universiti Malaysia Pahang, Kuantan, Malaysia  
Department of Biological and Ecological Engineering, Oregon State University, Corvallis, USA

### **ABSTRACT**

Worldwide, crude palm oil industries generate an overwhelming amount of palm oil mill effluent (POME). Since the past few decades, environmental issues associated with POME disposal have challenged the palm oil-producing nations which led them to reevaluate and develop their waste management strategies by using advanced biotreatment technologies. With the help of these technological advances, POME has emerged as a valuable biomass resource with great potential to produce sustainable renewable resources like biogas. This review entails various POME treatment methods in vogue and offers an insight into their improved applicability potential and pollution mitigation strategies by using proposed improved configurations like ponding system, open digesting tanks, anaerobic digestion based-bioreactors, aerobic anaerobic hybrid bioreactors, and membrane bioreactors. This review paper also gives an overview about the recent advancements in POME treatment bioreactor configurations and emphasizing their scope in large-scale applications on an industrial level. This review also critically analyzes their performance level to achieve the standard POME discharge limit by efficiently removing high COD (chemical oxygen demand), BOD (biological oxygen demand), and TSS (total suspended solid).

### **KEYWORDS:**

Palm oil mill effluents; POME; Advanced bioreactor configurations; Biofuel