

Formulation of biofertilizers from oil palm empty fruit bunches and plant growth-promoting microbes: A comprehensive and novel approach towards plant health

ABSTRACT

Our heavy reliance on chemical fertilizers for agricultural practices has fostered the development of a vast industry that is producing chemicals that are toxic not only for humans but also for the environment. Biofertilizers are microbial formulations containing native plant growth-promoting microorganisms (PGPM) which have the potential to enhance plant growth either directly or indirectly by producing different types of phytohormones, iron-binding metabolites (siderophores), and solubilizing soil nutrients and minerals. The positive impacts on crop growth and development were documented by many researchers while using biofertilizers. Thus, biofertilizers offer enormous promise for sustainable agriculture, particularly in the face of climate change. Despite the growing interest in this technology, its entire potential remains untapped. This review collectively describes the potential use of empty fruit bunches (EFB) biomass as a biofertilizer for sustainable agricultural practices and the roles of plant growth-promoting microbes (PGPM) in plant growth and development. Attempts were also made to give insights into the oil palm industry in Malaysia and the nutrient profile of EFB biomass. We concluded that more research, fund and development activities are needed to improve traits of beneficial microbes that will potentially enhance the biological pathway of different biocompounds production and find solutions for the current issues related to converting EFB biomass into biofertilizers.