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TITLE:

INVESTIGATION OF BIOSTIMULANT FOR ORGANIC FOOD PRODUCTION

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ABSTRACT

There is a lot of type of algae in this world who has many species and function example of types of algae which is green algae, red algae and golden algae. Based on this there are a lot of use of algae that have been research and turn into product for example food, cosmetics, bioplastic and biodiesel industry. However, for bio-stimulant that been use for help plant growth is from green microalgae (Chlorophyta). Green algae or Chlorophyta have been studied to develop a better replacement for the current fertilizer that been use in agriculture right now. From the studied its show a positive impact that bio-stimulant is indeed is better than biofertilizer because algae naturally produce a wide range of bioactive compounds, including phytohormones, vitamins, antioxidants, which can promote plant growth, enhance nutrient uptake, and making it a valuable natural alternative to synthetic chemicals in agriculture. However, has a new study that prove bio-stimulant is better alternatives compare to biofertilizer in two differences medium and which is more effective bio-stimulant collected microalgae or microalgae that been culture to see which help the plant growth better. This chapter was a summarised of several research and lab work that was conducted around 14 weeks on bio-stimulant culture algae compared to biofertilizer and bio-stimulant collected microalgae where the observation plant height and the root length. Furthermore, this research is aiming for agriculture industry that use a lot of biofertilizer where produce a lot of harmful chemicals waste to drain when watering their plants and eventually the waste will flow into the river stream and harm the aquatic environment.

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CHAPTER 1
BACKGROUND

1.1 Introduction

The current year that we are living today have a high level of population where it leading to increasing high water consumption every year. This will cause water pollution since a lot of people using water every day in their daily lives. Wastewater came from many sources for example domestic, agricultural and industrial sources all combine together. (Mustaffa et al., 2019) Wastewater generally contains organic masses like proteins, carbohydrates, lipids, volatile acids and inorganic content (macronutrients and micronutrients) containing nitrate ions, phosphate ions, sodium, calcium, potassium, magnesium chloride, sulphur, bicarbonate, ammonium salts, and heavy metals. (Wang et al., 2015) These nutrients will lead to algae to grow due to anthropogenic waste production.

Conventional methods been use for the treatment of wastewater are highly operational, with high use of chemicals, and maintenance costs which make them undesirable. These methods can reduce the pollutants for a limited time and at the same time increase the load of these micropollutants in soil and groundwater. (Verma et al., 2021). Recently, algal technology, which is renewable and sustainable, has been suggest as the cheapest method for the treatment of wastewater over conventional methods (Ali et al., 2022). There are several species of microalgae that are able to adapt and grow efficiently in wastewater environments such as Chlorophyta through their capability to treat and uptake the abundant natural inorganic compounds such as nitrate, phosphate, magnesium, sodium, calcium, potassium and heavy metals in the wastewater (Rawat et al., 2024). Micro algae are suitable agents for bioremediation of wastewater because it has additional advantages for example sources of biofuel, carbon dioxide mitigation, food sources etc.

Microalgae are potential source that can transform solar energy into chemical energy, improving food supply, reducing greenhouse gas emissions, and providing the prospect of developing a unique wastewater treatment approach with sustainability.(Gaurav et al., 2024). When executed for wastewater treatment, it has many advantages for