

TECH OFFER

Low-Cost Cultivation of Purple Phototrophic Bacteria (PPB) For Plant Growth Support



KEY INFORMATION

TECHNOLOGY CATEGORY:

Sustainability - Food Security

Waste Management & Recycling - Food & Agriculture

Waste Management

Foods - Quality & Safety

TECHNOLOGY READINESS LEVEL (TRL): **TRL7**

COUNTRY: **SINGAPORE**

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OVERVIEW

Side stream valorisation in sectors such as food and beverage manufacturing has gained substantial interest over the years. The waste streams, in particularly the liquid has high amount of nutrients and organics, in which suitable bioprocesses can be deployed to convert them into value-added products.

One product of interest is the purple phototrophic bacteria (PPB), a metabolically diverse group of proteobacteria that contains pigments bacteriochlorophyll a and b. Attributed to its unique versatile metabolic pathways, PPB can be used as powerful pollutant removal in different types of wastewater treatments, under stressful conditions. Its light utilization process and hormone secreting properties also made PPB a good bio-fertilizer and bio-stimulant for plant growth.

This proposed PPB cultivation technology in photobioreactor (PBR) system has greater treatment efficiency and higher biomass

conversion rate than conventional open pond systems. Biomass generated from this cultivation technology demonstrated its ability to enhance essential nutrients in soil and supply key plant hormones that aid in plant growth. This novel application of PPB can be adopted in the agriculture industry, in the effort to develop more eco-friendly agricultural inputs.

The technology provider is seeking for collaborators to test bed the technology to license the technology.

TECHNOLOGY FEATURES & SPECIFICATIONS

The biomass conversion process boasts high efficiency, achieving up to 0.8 grams of biomass for every gram of chemical oxygen demand (COD) removed. Its versatility allows it to work with various types of feed, adaptable to different loads and conditions. High efficiency and robustness of the technology also contribute to more compact system design and lower operating cost. This sustainable approach in PPB production utilizes waste streams from food manufacturing sectors, transforming waste into valuable products. Additionally, biomass generated from the technology offers a novel application in stimulating and supporting plant growth.

POTENTIAL APPLICATIONS

The PPB technology can be deployed in wastewater treatment processes, to remove organics and pollutants efficiently. PPB can enhance essential nutrients in the soil and support plant growth. It can be used as alternative agricultural inputs such as bio-fertilizer and bio-stimulant, promoting crop yield in a sustainable manner. Value-added product derived from the technology also has high level of protein content, which can be utilised as alternative in animal feed formulation for aquaculture or livestock breeding.

UNIQUE VALUE PROPOSITION

This novel compact PPB cultivation technology offers higher treatment efficiency and wider product applications than the conventional open ponds systems.