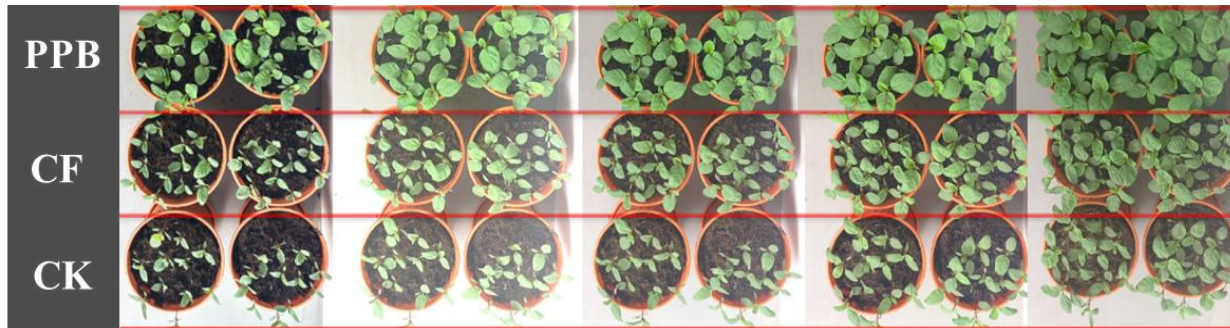


NEWRI INNOVATION

PURPLE PHOTOTROPHIC BACTERIA (PPB): A HIGH-PERFORMANCE PLANT GROWTH-PROMOTING RHIZOBACTERIA

BACKGROUND

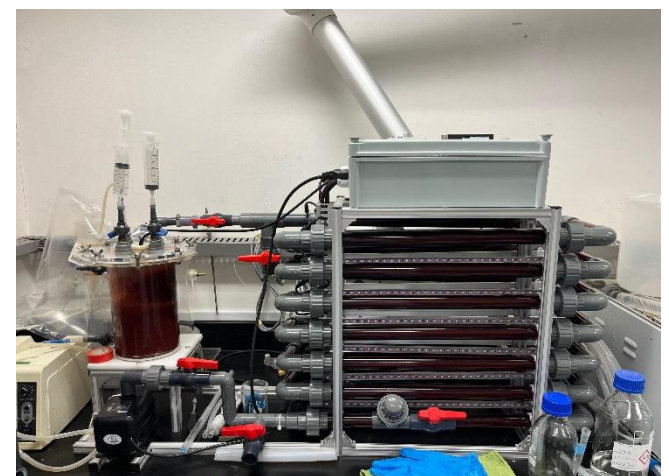
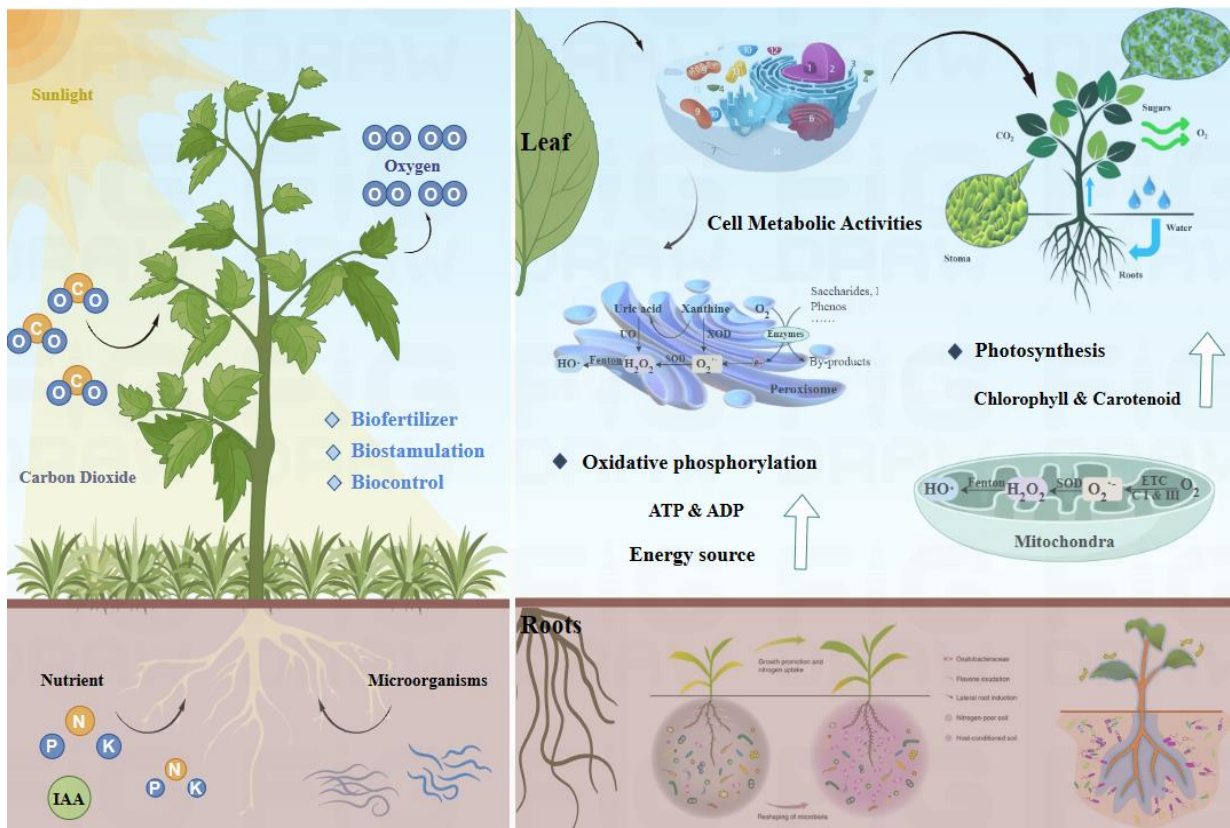
Currently, approximately one billion people (16% of global population) suffer from chronic hunger, and the demand for food becomes increasing urgent with the global population continuing to rise. Before 2050, the food production must be increased by 70% on already over exploited finite infrastructures. However, this goal faces formidable challenges owing to the ever-increasing nutrient requirement in farmland soil, and the up-coming mineral exhaustion in next decades. Therefore, there is an urgent need to develop the cost-effective and eco-friendly fertilizers to increase food production and ensure global food security.



PERFORMANCE AND MECHANISMS

- Purple photosynthetic bacteria (PPB), is a metabolically diverse group of proteobacteria that contains the pigments bacteriochlorophyll *a* and *b*.
- PPB could use either sulfur, hydrogen, iron or organic compounds as electron donors during the light-harvesting reactions.
- PPB could increase the content of organic carbon, nitrogen and phosphorus in soil. Meanwhile, the plant hormones secreted by PPB, such as salicylic acid, indoleacetic acid and gibberellin, could promote plant cell division and photosynthetic pigment synthesis.
- PPB harvest light energy to assimilate a wide variety of small molecular weight organic and/or inorganic carbon compounds, allowing more efficient growth.

The Application of PPB to Support Plant Growth



Presented by

Biotechnology and Bioprocesses
Nanyang Environment and Water Research Institute

