

Purple Non-Sulfur Bacteria (PNSB) and Rotation System as a Sustainable Solution to Rice (*Oryza sativa*) Production Problem in Fiji

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Abstract

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Rice is a major staple food consumed by all ethnic groups in Fiji. However, rice production in Fiji has been declining since the 1980s due to several problems, of which poor management practices top the list. On the other hand, global warming and climate change are ongoing issues in smaller island countries like Fiji. As such, sustainable management practices are the key method that can be employed to increase rice production without contributing much to climate change. Crop rotation is an easy yet effective way to sustainably improve crop growth by suppressing weeds, insects, and plant diseases. It also helps to improve the soil's physical, chemical, and biological properties. Djulis (*Chenopodium formosanum* Koidz.), a traditional food crop of Taiwan, shows the potential to be rotated with rice due to its immense benefit to human and soil health. Another sustainable way to improve rice production can be through the utilization of plant growth-promoting bacteria (PGPB) such as purple non-sulfur bacteria (PNSB) that can help fix the nitrogen and produces plant growth substances such as indole-3-acetic acid (IAA) and 5-aminolevulinic acid (ALA). However, with limited available studies, further research is needed to confirm these hypotheses.

Keywords: Djulis, Photosynthetic Bacteria, Purple Non-sulfur Bacteria, Rice Rotation

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