

## EFFICIENCY OF PLANT GROWTH-PROMOTING RHIZOBACTERIA FOR THE ENHANCEMENT OF RED RICE GROWTH

## EFICIÊNCIA DE RIZOBACTERIAS PROMOTORAS DE CRESCIMENTO VEGETAL PARA O AUMENTO DO CRESCIMENTO DO ARROZ VERMELHO

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Plant growth-promoting rhizobacteria (PGPR) are beneficial bacteria that colonize plant roots and enhance plant growth by a wide variety of mechanisms. The use of PGPR is steadily increasing in agriculture and offers an attractive way to replace chemical fertilizers, pesticides, and supplements. Here, we have isolated and characterized the PGPR from the rhizosphere soil of red rice field for the enhancement of growth of red rice. Rhizosphere soils were collected from different areas of Paraíba in Brazil. Ten isolates of bacteria, designated as PGB1, PGB2, PGB3, PGB4, PGB5, PGT1, PGT2, PGT3, PGG1 and PGG2, were successfully isolated and characterized. Subsequently, to investigate the effects of PGPR isolates on the growth of red rice, a pot culture experiment was conducted. Prior to seeds grown in plastic pots, seeds were treated with PGPR isolates and seedlings were harvested after 21 days of inoculation. Isolates PGB4, PGT1, PGT2, PGT3, PGG1 and PGG2 induced the production of indole acetic acid (IAA), whereas only PGT3 isolate was able to solubilize phosphorus. Most of isolates resulted in a significant increase in plant height, root length, and dry matter production of shoot and root of red rice seedlings. Furthermore, PGPR isolates remarkably increased seed germination of red rice. Among the ten isolates, PGB4 and PGG2 were found almost equally better in all aspects such as dry matter production, plant height and root length of red rice, and IAA production. Isolate PGT3 was also found to be promising in IAA production having an additional property of phosphate solubilization. The present study, therefore, suggests that the use of PGPR isolates PGB4, PGG2 and PGT3 as inoculants biofertilizers might be beneficial for red rice cultivation as they enhanced growth of red rice, and induced IAA production and phosphorus solubilization.

**Palavras-chave:** PGPR, indole acetic acid, phosphorus solubilization, seed germination.

