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INDOLE 3-ACETIC ACID PRODUCING BACTERIA FROM ONION RHIZOSPHERE

G.R. Fernando[1,2], S. Abeysinghe[2], S.M.K. Widana Gamage[2*] and R.G.S.C. Rajapakse[1]

[1]Department of Molecular Biology and Biotechnology, Faculty of Science, University of Peradeniya, Sri Lanka
[2]Department of Botany, Faculty of Science, University of Ruhuna, Sri Lanka
[*]shirani@bot.ruh.ac.lk

Onion (*Allium cepa* L.) is an important crop in Sri Lanka. It is important as a condiment, a leafy vegetable, and an ingredient in indigenous medicine. A recent study showed that the growth and quality of onion bulbs can be improved by exogenous application of Indole 3-acetic acid (IAA). Some phytohormones are known to improve human health. The current study aimed at isolating and identifying IAA-producing bacteria from the onion rhizosphere and incorporating them into plant-growth-promoting-rhizobacterial (PGPR) consortia. Rhizobacteria were isolated from the roots of onions grown in three main onion-growing areas in Sri Lanka, *viz*., Jaffna, Dambulla, and Angunakolapelessa. Both free-living and endophytic bacteria were isolated in nutrient agar. Hundred and twenty-six morphologically distinct strains were isolated and screened for their ability to synthesize IAA, with and without induction, by the externally added tryptophan (0.2% [w/v]), which is a precursor of IAA. Accumulated IAA in the culture broth was estimated spectrophotometrically at 535 nm following Salkowski's method. Twenty-one strains, including two endophytic bacterial strains, were found to be IAA producers. More efficient IAA production was obtained in tryptophan-induced cultures. Two strains, i.e., R1OJ2 and OD20 produced > 200 mg/L of IAA while ROJ10, ROJ7, ROD12, ROJ5, ROJ50, ROD16, ROD15, ROA10, and ROJ8 produced >100 mg/L when induced. None of these strains could produce > 100 mg/L without tryptophan but ROJ7, ROJ11, ROJ2, ROJ50, ROJ38, and ROD16 produced IAA around 50 mg/L. The endophytic strains, EOA7 and EOJ1, also showed high IAA production, 73.4 mg/L and 83.6 mg/L, respectively. According to a previous study, IAA at 50 mg/L promotes onion growth, while IAA at 200 mg/L increases phenol content, thus increasing its medicinal value. Hence, ROJ7, ROJ11, ROJ2, ROJ50, ROJ38, and ROD16 strains are good candidates for PGPR-consortium development, while ROJ2, ROD20, and ROA10 are good candidates for enhancing the medicinal value of onion.

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