Roles of *Enterobacter* sp. as plant growth-promoting bacteria: A focus on cereal crops

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Abstract

Plants can establish a symbiotic relationship with plant growth-promoting rhizobacteria (PGPR), through which they thrive in biotic and abiotic stress conditions. The genera *Enterobacter* is one of the PGPRs from the Enterobacteriaceae family reported as a non-pathogenic gram-negative bacteria, a potential candidate suitable for plant growth and development. Numerous *Enterobacter* strains express these positive effects, including nitrogen fixation, phosphorus solubilization, production of antibiotics, ability to secrete siderophores produce, 1-aminocyclopropane-1-carboxylate (ACC) deaminase, and various phytohormones. Furthermore, studied bacterial strains had been demonstrated to have antimicrobial activities (over 50% inhibition) in in vitro conditions. Hence, this review discusses the current findings on the roles of *Enterobacter* spp. to increase its upscaling as a plant growth promoter and as a biocontrol agent biofertilizer. Furthermore, the studies exhibited that the salt and drought-tolerant attributes conducted on inoculated rice seedlings, wheat, and maize demands confirming greenhouse and field studies of these crops and other host plants to develop novel biofertilizers and biopesticides.

Keywords: *Enterobacter*, bio-fertilization, biocontrol agent, salt-stress tolerance, drought-tolerance, microbial inhibition

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