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Endophytic Rhizobacteria for Mineral Nutrients Acquisition in Plants: Possible Functions and Ecological Advantages

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Abstract

Nutrient-deficiency in agricultural soils is a major problem in many parts of the world, it is, therefore, artificial fertilizers are widely used to boost crop production. Unfortunately, these fertilizers are associated with a myriad of environmental problems hence, there is a need for viable alternatives. The realization that the plant microbiome can improve plant health, soil fertility, and crop productivity is one of the most fascinating scientific discoveries in the world. For several decades, rhizobacteria have been studied due to their various plant growth-promoting (PGP) traits. Endophytic rhizobacteria are unique plant microbiome that establish themselves within plant root tissues and exert beneficial functions to their hosts without harming them. A lot of emphases have been put on these bacteria as viable tools for sustainable agriculture and it is advanced that they could be better plant growth promoters than their external counterparts. However, this theory is not yet clearly understood. This chapter provides the current state of understanding of the putative functions of endophytic rhizobacteria and their future prospects for plant mineral nutrients acquisition. Their advantageous traits that largely advanced to facilitate these PGP functions are also discussed. Such informations can provide better opportunities for improved plant mineral nutrients acquisition and enhance the application of these microbes as viable strategies for sustainable agriculture.

Keywords

Endophytes; Rhizobacteria; Sustainable agriculture; Plant growth promotion