Evaluation of the potential of epiphytic bacterial isolates associated with invasive exotic plants in promoting growth cultivated plants species.

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The successful evolution of species is intricately linked to the genetic variability of populations and the selective pressures of their established environments, where some excel in various aspects, particularly in the invasion of new habitats. Some introduced plants fail to fully adapt to the new conditions and, consequently, may be eliminated or establish themselves as invasive species. Invasive exotic species often exhibit phenotypic traits that facilitate their reproduction and dispersal, granting them competitive advantages over native species and potentially causing ecological imbalances. To enhance the performance of these plants, certain associated microorganisms can provide various additional atributes. The plant-microorganism interaction, viewed through the lens of mutualistic symbiosis, can promote plant growth through nutrient mobilization and transport, nitrogen fixation, phosphate solubilization/mineralization, phytohormone production, among other mechanisms. In this context, this study aimed to identify and evaluate the biotechnological potential for promoting the growth of cultivated plant species using epiphytic bacterial isolates derived from invasive exotic plants. To achieve the proposed objectives, healthy leaf and root samples from invasive exotic plant species were collected near water bodies in the states of ES and RJ, and microorganisms present were isolated. Among the isolates obtained, some were randomly selected for *in vitro* growth promotion testing through seed microbiolization of *Raphanus sativus*, and the most promising isolates were subsequently subjected to the same *in vivo* test using *R. sativus* and *Zea mays* seeds. Isolates with the highest potential, as determined through statistical analyses, were further subjected to phosphate solubilization and siderophore production assays, in addition to molecular identification. A total of 120 cultivable epiphytic microorganisms were obtained, of which 108 were bacteria. Among the 10 initially selected bacterial isolates for growth promotion tests, isolates A1F.3 and A1R.14 statistically stood out in terms of variables analyzed, such as aerial and root part length, fresh aerial mass and germination rate. Isolate A1F.3 demonstrated phosphate solubilization capability, while isolate A1R.14 exhibited siderophore production, both of which are direct mechanisms aiding growth promotion. Interestingly, isolated A1R.14 was identified as *Stenotrophomonas maltophilia*, a species previously recognized as an effective promoter of plant growth, significantly enhancing growth, ionic balance and biochemical parameters in some cultivars. The results obtained open avenues for further investigations into other direct growth promotion mechanisms and field tests to assess biosafety and potential biotechnological applications of these microorganisms, offering an alternative for sustainable and productive agricultural development.

Key words: *Agricultural biotechnology; Bioinsumus; Ecological adaptations; Plant growth promotion.*

Avaliação do potencial de isolados bacterianos epifíticos associados a plantas exóticas invasoras na promoção do crescimento de espécies de plantas cultivadas.

A variabilidade e seleção natural impactam o sucesso das espécies. Algumas espécies vegetais invasoras competem com nativas devido a características vantajosas, sendo auxiliadas por microrganismos durante o crescimento. Este trabalho isolou bactérias epifíticas de plantas exoticas invasoras, testando seu potencial de promoção de crescimento em cultivares. Testou-se inicialmente 10 isolados, sendo A1F.3 e A1R.14 destaques promovendo o crescimento em rabanete e milho, além de solubilizar fosfato e produzir sideroforos. Identificou-se A1R.14 como *Stenotrophomonas maltophilia,* previamente conhecida como promotor de crescimento. Os resultados iniciais sugerem potencial biotecnológico agrícola, sendo necessários estudos subsequentes avaliando outros mecanismos promotores de crescimento e a biossegurança em campo.

Palavras-chave: *Adaptações ecológicas; Bioinsumos; Biotecnologia agrícola; Promoção de crescimento vegetal*

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