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Abstract

A Different Point of View of Plant-Bacterial Interactions: RNA-Seq Analysis of a PGP Bacterial Endophyte Colonizing Rapeseed Plants †

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Some microbes are important players in plant fitness, contributing to their nutrient acquisition and protection against diverse biotic and abiotic stresses [1]. Despite the vast knowledge acquired during recent decades about the effects in plants of plant growth-promoting (PGP) bacteria [2], apart from those of the legume–rhizobial interactions [3], not much is known about the response of bacteria to the interaction with the plant. With the aim to decipher the transcription profile of a non-rhizobial strain in its interaction with the plant, a PGP *Pseudomonas* strain isolated from *Brassica napus* roots and capable of protecting the plant from biotic and abiotic stresses was inoculated onto rapeseed seedlings. Eleven days post-inoculation, we obtained the RNA-Seq profile of bacterial cells colonizing the seedlings' roots. RNA from free living cells was used as a control. Our analyses allowed us to identify 1378 differentially expressed bacterial genes (log2 fold change >2; adjusted p value < 0.05). The most overexpressed genes in the interaction are related to biofilm formation, bacterial immunity and infection and bacterial resistance to antimicrobial compounds, likely excreted by the plant. However, genes implicated in PGP traits which had been previously demonstrated in vitro for this strain appeared to be not significantly overexpressed, suggesting a latter PGP action in the interaction. Based on this RNA-Seq experiment, our results shed light on bacterial mechanisms to effectively colonize plant roots, to survive plant defense mechanisms, and to promote plant immunity.

Supplementary Materials: The poster presentation is available online at https://www.mdpi.com/article/10.3390/IECPS2020-08726/s1.

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