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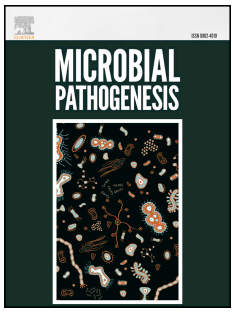

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Strigolactones promote rhizhobial interaction and increase nodulation in soybean (*Glycine max*)

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Abstract:

Strigolactones (SLs) play an important role in controlling root growth, shoot branching, and plant-symbionts interaction. Despite the importance, the components of SL biosynthesis and signaling have not been unequivocally explored in soybean. Here we identified the putative components of SL synthesis enzymes *GmMAX1a and GmMAX4a* with tissue expression patterns and were apparently regulated by rhizobia infection and changed during nodule development. *GmMAX1a and GmMAX4a* were further characterized in soybean nodulation with knockdown transgenic hairy roots. *GmMAX1a and GmMAX4a* knockdown lines exhibit decreased nodule number and expression levels of several nodulation genes required for nodule development. Hormone analysis showed that *GmMAX1a and GmMAX4a* knockdown hairy roots had increased physiological level of ABA and JA but significantly decreased auxin content. This study not only revealed the conservation of SL biosynthesis but also showed close interactions between SL and other hormone signaling in controlling plant development and legume-rhizobia interaction.

Keywords: Strigolactones, rhizobia interaction, hormone biosynthesis, GmMAX1, GmMAX4, soybean nodulation.

Introduction

Strigolactone (SLs) the currently emerging hormones and a novel group of terpeniod lactone derived from carotenoid, were first recognized as a constituent of root secretion for