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GR51

ASSESSMENT OF GROWTH-PROMOTING PROPERTIES OF *PSEUDOMONAS* SPP. ON SOYBEANS UNDER FIELD CONDITIONS

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The soybean is recognized worldwide as one of the most important crops due to its protein- and oil-rich seeds. Several beneficial bacterial strains, including those of the genus *Pseudomonas*, are known to increase plant yield and disease tolerance. The aim of this study was to test the potential of 15 strains of *Pseudomonas* spp. to promote soybean growth under field conditions. Strains were identified based on 16S rRNA and gyrB sequences, and strains belonging to risk group 1 were further analyzed. Selected strains were tested for plant growth-promoting (PGP) properties, biofilm formation and *in vitro* antimicrobial activity against various fungal pathogens. PGP activity indicators of the selected strains were evaluated on soybean plants grown in fertilizer-free soil and in soil treated with 70% and 100% fertilizers. Three *Pseudomonas* spp. strains, *P. putida* VB131A, *P. fulva* VB134B and *P. rhodesiae* VB143S, were selected as PGP candidates. All

three strains showed the ability to produce IAA and solubilize phosphorus, while only *P. rhodesiae* VB143S showed strong lipase and protease activity. Only *P. fulva* VB134B showed the ability to produce biofilm and hydrogen cyanide. All three strains showed *in vitro* antifungal activity against *Alternaria infectoria*. *P. fulva* VB134B and *P. rhodesiae* VB143S showed antifungal activity against *Alternaria alternata* and *P. putida* VB131A and *P. rhodesiae* VB143S against *Epicoccum nigrum*. Only *P. fulva* VB134B showed activity against *Monilinia laxa*. Statistically significant differences in plant height were not observed regardless of the strain or soil treatment used. In terms of first pod height, the *P. fulva* VB134B treatment was most effective when applied to soybeans grown in 100% fertilized soil. In contrast, plants treated with *P. rhodesiae* VB143S and grown in 100% fertilized soil had the highest number of branches and pods per plant.

KEYWORDS: *Pseudomonas* spp.; soybean; plant growth-promoting properties.

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