



Isolation and characterization PGPB of endophytic bacteria from spontaneous plants of Algerian Sahara.

DIF Guendouz^{1, 2}, BELAOUNI Hadj Ahmed², REGHIOUI Hocine², GOUDJAL Yacine², YEKKOUR Amine², TOUMATIA Omrane², SABAOU Nasseridine², ZITOUNI Abdelghani²

¹Université de Ghardaïa.

²Laboratoire de Biologie des Systèmes Microbiens (LBSM), Ecole Normale Supérieure de Kouba, Alger, Algeria.

Kdgb2007@yahoo.fr

ABSTRACT

50 endophytic bacteria from spontaneous plants of saline regions in Algeria have been studied for their potential to promote tomato growth under salt stress. The screening for salinity resistance on TSA agar medium using various concentrations of NaCl (0.5, 1, 2.5, 3.5 and 5%), showed the valuable resistance of isolates BH01, BH40, BH39, BH49 and BH50 to salinity, characterized by a good growth at the different salt concentrations. These five isolates were subsequently subjected to a polyphasic taxonomic study and a 16S rDNA sequencing to determine their phylogenetic position. Most of the strains were related to the *Bacillaceae* family, a family already known to contain several effective members as biotechnological inoculum for improving crops yield. Furthermore, this study also aimed to characterize the direct PGPR mechanisms, namely, the production of plant hormones like IAA, and indirect PGPR mechanisms such as the antagonistic activity to ward different plant pathogens and the production of lytic enzymes antifungal. The HPLC analysis of the IAA production ability showed that the five selected isolates were able to produce this plant hormone, where BH40 were the highest producer. In addition, the five isolates limit the growth of plant pathogens or toxigenic fungi such as *Penicillium expansum*, *Aspergillus carbonarius*, *Fusarium culmorum* and *Mucor ramannianus* (in crossed streak method), with greater abilities for BH39 and BH50. The selected strains effectively degrade the constituent compounds normally found in fungi, including chitin, cellulose, and pectin, as well as a good proteolytic activity, characteristics which could be related to the biocontrol potential.

Keywords: endophytic, spontaneous plants, biocontrol, salt stress.