COMPOUNDS PRODUCED BY *Bacillus subtilis* STRAIN BEB-DN CHANGE THE ROOT ARCHITECTURE.

Estephany Tondopo-Jiménez, Stefany Licona-Velázquez. Silvia Valdés-Rodríguez, Víctor Olalde-Portugal.
Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional (CINVESTAV), Irapuato, 36821;
tj.estepha@gmail.com.

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Introduction. The root is a very important organ which involved in plant development, due to it is responsible for the taking of the nutrients and water. Taking into account the importance of the root in the agricultural production systems, there are many studies directed to improve the abilities of roots (Gewin, 2012). The interaction of roots with PGPR (Promoting Growth Plant Growth) is one of the mechanisms that have much relevance in plant development. Several PGPR species have been described; one is *Bacillus subtilis* has been widely described because its biology and genome are known. One of the important biological processes in *B. subtilis* is cell differentiation. This occurs by two processes: the quorum-sensing and starvation, where there is a set of signals that triggers different cell types: flagellated, cannibals, competent cells, spore cells, extracellular matrix and mining (degradive enzymes producers). These changes are due to activating of specific networks by signals among in the population. These signals are peptides which have had biotechnological applications (Kearns y Losick, 2006; Lopez *et al*., 2009; Lopez y Kolter, 2010). In our laboratory, it was shown that the *B. subtilis* strain Beb-DN modified the *Arabidopsis thaliana* Eco-0 root architecture. The objective of this work is purified and characterized the compounds that promote these changes.

Methods. To perform the purification, a cell-free extract (CFE) from of *B. subtilis* strain Beb-DN in early stationary phase cultures was obtained. This was purified by ion exchange chromatography in tandem, using a 0.05 M KCl gradient for elution for cationic compounds. After this, a reverse phase chromatography was performed on a Sep-pak-C18 column, recovering the most hydrophobic fractions. These fractions were analyzed by RP-HPLC, using acetonitrile gradients.

Results. Some of the partially purified fractions modified the architecture of the root seedlings of *A. thaliana* Eco-0. One fraction called E1-4.1.6 showed significant changes in root length, diameter, number of root hairs and number of branches (Fig. 1). The purification of this fraction is in process to find the active compound which causes these alterations (Fig. 3).

Conclusions. There compounds produced by *B. subtilis* Beb-DN modifying root architecture.

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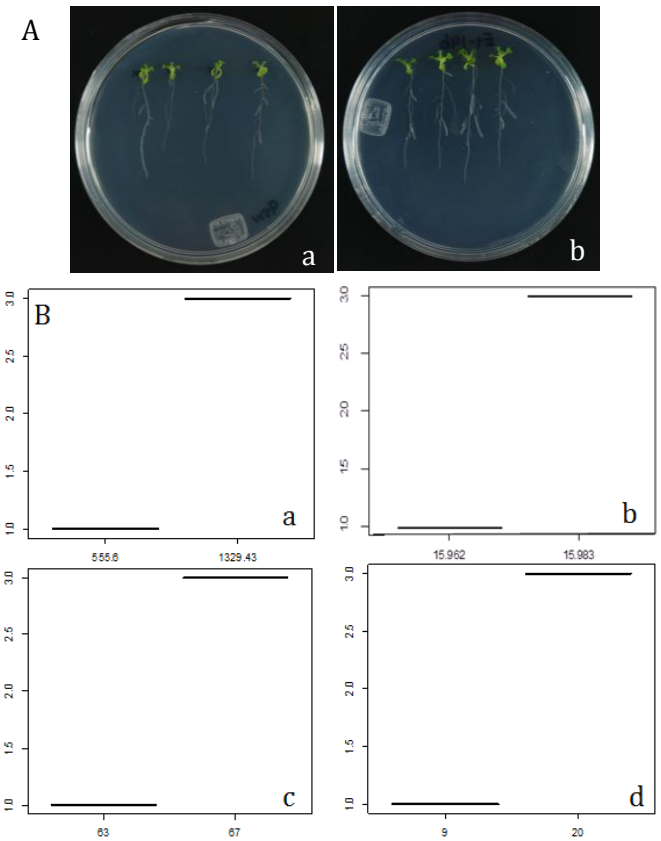

Fig.1 A) Effect of 4.1.6 fraction of the CFE *B.*subtilis strain Beb-DN. a) Control: MS medium. b) Fraction purification process. B) Influence of the 4.1.6 fraction of the *A. thaliana* Eco-0 seedling roots. The bars represent the average value of length (a-mm), diameter (b-mm/10), number of hairs root (c) and number of branches (d) in control (left) and fraction (right).

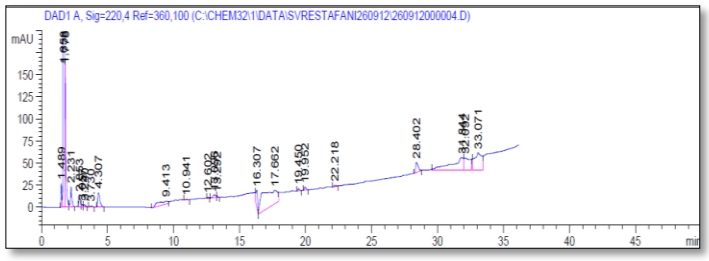

Fig.3 HPLC chromatogram end of 4.1.6 fraction (in acetonitrile gradient at 280 nm).

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