



# I-INTERNATIONAL MEETING OF ANIMAL SCIENCE IN SEMI-ARID REGIONS

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Field of Study: Forage Science

## Do endophytic bacterium *Bacillus aryabhatai* stimulates the formation of shoots in *Nopalea cochenillifera* (L.) Salm-Dyck var. *miúda*?

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Plant growth-promoting bacteria (BPCVs) can promote plant growth in several ways, including regulating phytohormone production, absorbing mineral nutrients, and inducing plant resistance to biotic and abiotic stresses. Among the BPCV is *Bacillus aryabhatai*, a gram-positive rod-shaped bacterium that was isolated and identified for the first time in 2007. Since then, several strains have been isolated from the rhizosphere of various plants around the world, including Brazil. Since its discovery, it has shown promise in promoting plant growth and increasing the yield of agricultural crops. In this sense, it is of relevant interest to verify whether *B. aryabhatai* can promote growth in *Nopalea cochenillifera* (L.) Salm-Dyck var. *Miúda*, a variety of forage cactus widely cultivated and used to feed domestic ruminants in the Brazilian semiarid and other arid areas and semiarid regions of the world. Therefore, the present study assessed whether the endophytic bacterium *B. aryabhatai* (CBMAI 1120) stimulates the formation of shoots in plants of *N. cochenillifera* (L.) Salm-Dyck var. *Miúda*. For this purpose, a greenhouse pot experiment was set up. Divided into two groups: a control group - consisting of non-inoculated plants; and an inoculated group containing plants inoculated with *B. aryabhatai*. The plants in the inoculated group were inoculated with  $1 \times 10^8$  CFU at 20 days after planting and re-inoculated after 15 days. The pots with a capacity of (10 L) contained local indigenous soil (sandy clay loam texture) fertilized with sheep manure at a dosage of 20 g/kg of soil. The seedlings were kindly provided by the Agronomic Institute of Pernambuco (IPA). The groups were randomly distributed and kept under the same cultivation conditions. At 30 days after inoculation, the number of shoots of succulent stems (cladodes) emitted after planting was counted. The number of shoots in the inoculated group (5.5 cladodes/plant) was slightly higher compared to the control group (4.7 cladodes/plant). This increase in the total quantity of cladodes in the inoculated plants can be attributed to the production of the phytohormone AIA and improvement of the nutritional status promoted by *B. aryabhatai*, as it acts in the root system, aiding in the availability of macronutrients such as phosphorus through the production of organic acids and the enzyme phosphatase. In addition to phosphorus, some studies indicate that *B. aryabhatai* is also capable of making nitrogen and potassium available, essential nutrients that are required in large quantities, which helps in plant growth. It is concluded that inoculation with *B. aryabhatai* promotes a 15% increase in the number of shoots in *N. cochenillifera* under greenhouse conditions. The confirmation of the growth-promoting mechanisms of *B. aryabhatai* is currently under investigation.

**Keywords: Physiology; Cactaceae; Agriculture; Semiarid; Microorganisms.**

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