

## **SELECTION AND CHARACTERIZATION OF RHIZOBIA STRAINS WITH HIGHEST NITROGEN-FIXING EFFICIENCY ON *LUPINUS ALBUS L.***

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Leguminous plants establish symbiosis with soil bacteria, named rhizobia, that permit the fixation of atmospheric nitrogen. Therefore, leguminous plants are self-sufficient for nitrogen nutrition and their cultivation is an advantage for other non-leguminous crops cultivated in succession. The increase of nitrogen fixation is possible selecting rhizobia strains with highest fitness. In this work, the selection and characterization of *Ochrobactrum lupini* (ex *Bradyrhizobium lupini*) strains with highest nitrogen-fixing efficiency on *Lupinus albus L.*, is described. From 108 isolations, performed from root-tubercles of three different lupin varieties, 46 strains of rhizobia were obtained. By molecular characterization (M13-PCR) of these strains, 21 different apotypes were observed. Seeds of Luteur pms 332 variety were inoculated with all the apotypes, singularly used, and sowed in open field. At flowering, plants inoculated with two strains showed a significative increase in growth. Respect to no-artificially inoculated plants (control), the plants inoculated with one of the two best strains were highest (plus 29 %), had the highest number of flowers (plus 37 %) and leaves (plus 56 %), highest dry matter of stem, leaves, flowers, roots and tubercles (plus 148 %, 91 %, 104 %, 153 % and 168 %, respectively). Moreover, leaves were most green coloured (SPAD value plus 16 %).

Investigations about leaf pigment composition, percentage of nitrogen fixation and sequence analyses of rhizobia genes involved in nitrogen fixation, such as *nif* and *hydrogenase hup* genes, are in progress.