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
The Determination of Symbiotic Effectiveness of Rhizobium Strains Isolated from Wild Chickpeas Collected from High Altitudes in Erzurum

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Abstract: This study was conducted in order to evaluate the symbiotic effectiveness of *Rhizobium leguminosarum* subsp. *ciceri* strains isolated from perennial wild chickpeas (*Cicer anatolicum*) collected from high altitudes (2000-2500 m) in mountains in Erzurum, Eastern Anatolia, Turkey. For this purpose, 21 isolates were obtained from wild chickpeas. Chickpea seeds were inoculated with these isolates and grown in pots containing sterile sand under both low (15 °C day/9 °C night) and normal (25 °C day/22 °C night) temperature conditions in a controlled plant growth cabinet. All strains investigated formed nodules under the normal temperature, but only 8 strains were able to produce nodules at the low temperature. In both normal and low temperature experiments, generally, all strains producing nodules provided N to the plant, as indicated by shoot dry weight, total N content, and N fixed. However, strains showed significant differences for almost all parameters measured. Among the strains tested, 7 strains at 25 °C day/22 °C night and 4 strains at 15 °C day/9 °C night demonstrated a good performance on chickpea in terms of their high shoot dry matter yields, total N content, N fixed, and symbiotic effectiveness. These results indicated that effective strains isolated from wild chickpeas had potential for use as inoculants on chickpea.

Key Words: Nitrogen fixation, *Cicer arietinum*, low temperature, *Rhizobium leguminosarum* subsp. *ciceri*, wild chickpea

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