

## Isolation and Characterization of Endophytic Bacteria Associated with Root-Nodules of *Medicago sativa* in Al-Ahsaa Region

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**Abstract :** *Medicago sativa* (Alfalfa) is an important forage crop legume worldwide including Saudia Arabia due to its high nutritive value. Soil bacteria exist in root or root-nodules of *Medicago sativa* in either symbiotic relationships or in associations. The aim of the present study was to isolate and characterize endophytic bacteria that live in association with non-nodulated roots of *Medicago sativa* growing in Al-Ahsaa region, Saudia Arabia. Several bacterial strains were isolated from sterilized roots of *Medicago sativa*. Strains were characterized using 16S rRNA gene sequences, phylogenetic relationships analysis, morphological and biochemical characteristics. The strains utilized 50% (10 out of 20) of the different chemical substrates contained in the API20E strip. In general, many strains had the ability to ferment/oxidise all the carbohydrate tested except for rhamnose and the polyol carbohydrate, inositol. Comparative sequence analysis of the 16S rDNA gene indicated that the strains were closely related to the genus *Bacillus*. Furthermore, the growth parameters of *Vigna sinensis* were enhanced upon single-inoculation of the isolated strains, compared to the uninoculated control plants. The results highlighted that the root-nodules of *Medicago sativa* harbor non-nodulating bacterial strains that could have significant agricultural applications.

**Keywords :** *Medicago sativa*, endophytic bacteria, *Pisum sativum*, *Vigna sinensis*

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