

DIVERSITY AND PLANT GROWTH PROMOTING POTENTIAL OF RHIZOBIA ISOLATED FROM ROOT NODULES OF *LOTUS CORNICULATUS* L.

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Background

- *Lotus corniculatus* L. is a valuable forage crop of high nutritional value that thrives on less fertile and/or degraded soils.
- The analysis of bacterial diversity within the root nodules of *Lotus corniculatus* is indispensable, as nitrogen fixing bacteria could be used to promote the growth of this valuable plant.

Objective

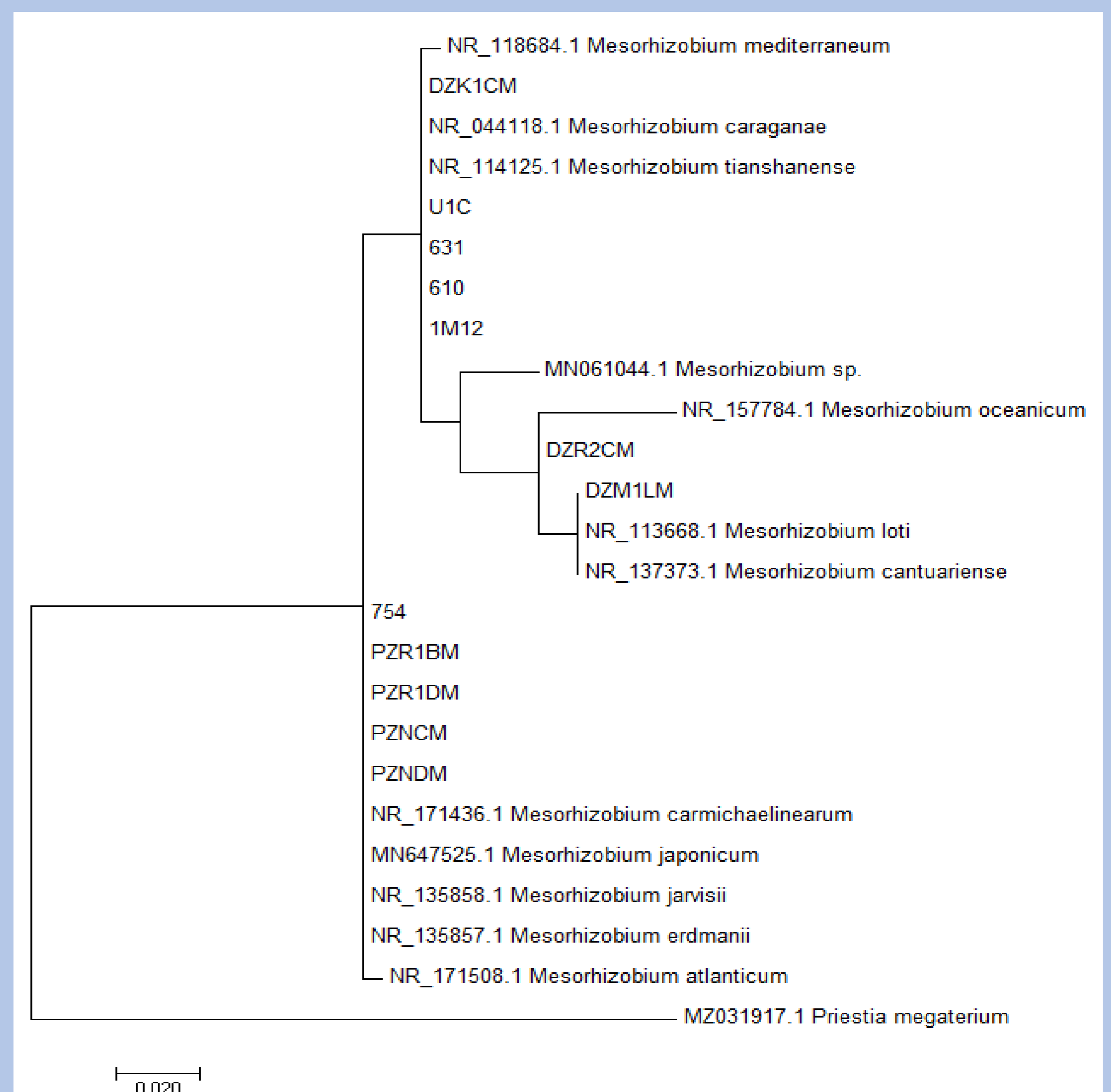
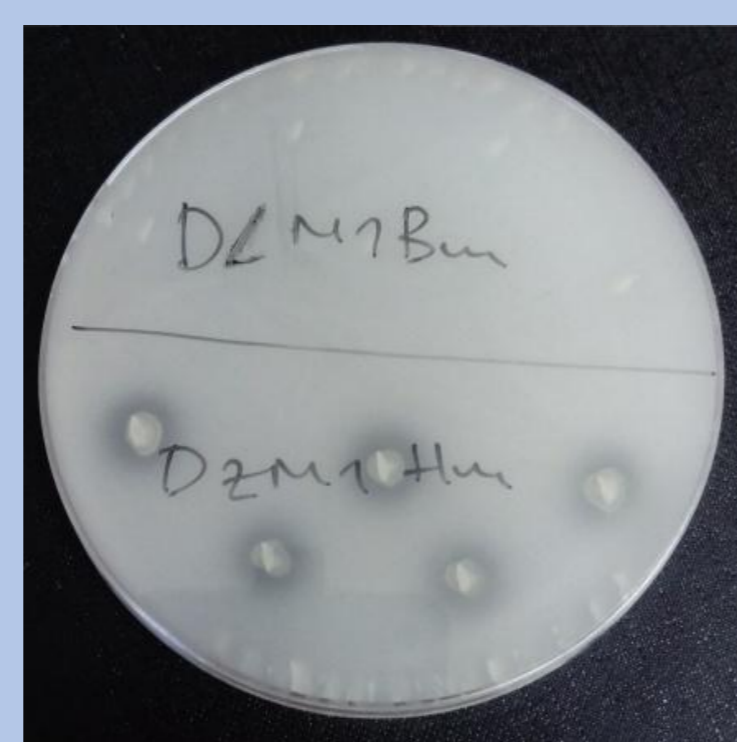
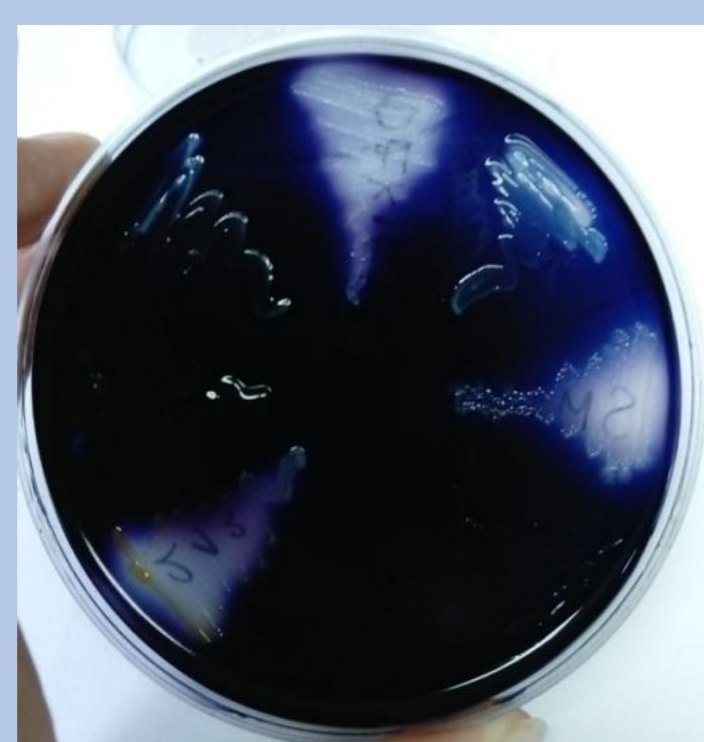
The aim of this research was to isolate and determine endophytic rhizobial bacteria from root nodules of *Lotus corniculatus* L. and to evaluate their plant growth promoting (PGP) characteristics.

Methodology

- Nitrogen fixation efficiency and the ability of isolates to produce PGP substances (indole-3-acetic acid (IAA), siderophores and to solubilise inorganic phosphates) was evaluated.
- Antifungal activity of isolates against fungi belonging to *Fusarium* genus and ability to produce hydrolytic enzymes (amylase, cellulase, protease and pectinase) was tested *in vitro*.
- The most effective isolates were subjected to further molecular characterisation, based on 16S rDNA sequence.

Results

- 72 bacterial isolates were isolated from the root nodules of *Lotus corniculatus* L.
- 58 isolates could infect the plant and form nodules on *Lotus corniculatus* L. roots.
- 50 isolates produced IAA in a wide range of concentrations, 29 isolates could solubilise inorganic phosphates, while siderophores production was not recorded.
- Few isolates had the ability to produce hydrolytic enzymes, while antifungal activity was not recorded.
- Sequencing results showed that all selected isolates belong to *Mesorhizobium* genus.



Conclusion

The results of this research indicated that there is wide rhizobial diversity present in the root nodules of *Lotus corniculatus* L. Further research should be aimed towards exploring the potential application of identified effective root nodule rhizobia in contemporary agriculture and organic farming.