Title: Molecular phylogeny of *Bradyrhizobium* bacteria isolated from root nodules of tribe Genisteae plants growing in southeast Poland

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PII: S0723-2020(17)30128-5
DOI: https://doi.org/10.1016/j.syapm.2017.09.001
Reference: SYAPM 25861

To appear in:

Received date: 25-5-2017
Revised date: 24-8-2017
Accepted date: 20-9-2017

Please cite this article as: Michał Kalita, Wanda Małek, Molecular phylogeny of Bradyrhizobium bacteria isolated from root nodules of tribe Genisteae plants growing in southeast Poland, Systematic and Applied Microbiology https://doi.org/10.1016/j.syapm.2017.09.001

Molecular phylogeny of *Bradyrhizobium* bacteria isolated from root nodules of tribe Genisteae plants growing in southeast Poland

Running title: Phylogenetic analysis of tribe Genisteae plants microsymbionts

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Abstract

The phylogeny of 16 isolates from root nodules of *Genista germanica*, *Genista tinctoria*, *Cytisus ratisbonensis*, and *Cytisus scoparius* growing in southeast Poland was estimated by comparative sequence analysis of core (16S rDNA, *atpD*, *glnII*, *recA*) and symbiosis-related (*nodC*, *nodZ*, *nifH*) genes. All the sequences analyzed placed the studied rhizobia in the genus *Bradyrhizobium*. Phylogenetic analysis of individual and concatenated housekeeping genes showed that the Genisteae microsymbionts form a homogeneous group with *B. japonicum* strains. The phylogeny of nodulation and nitrogen fixation genes indicated a close relationship of the examined rhizobia with *B. japonicum*, *B. canariense*, *B. cytisi*, *B rifense* and *B. lupini* strains infecting other plants of the tribe Genisteae. For the first time, the taxonomic position of *G. germanica* and *C. ratisbonensis* rhizobia, inferred from multigenic