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# **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

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