Genetic diversity and symbiotic effectiveness of *Mesorhizobium* and *Bradyrhizobium* strains nodulating selected annual grain legumes growing in Ethiopia

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*Cicer arietinum L., Vigna unguiculata, Vigna radiata*, and *Arachis hypogaea* growing in Ethiopia are nodulated by a genetically diverse group of rhizobia where chickpea (C. arietinum L.) being nodulated by Mesorhizobium genus while the latter three host legumes are by Bradyrhizobium strains. A collection of 167 test strains originating from the root nodules of respective hosts was investigated using multilocus sequence analyses (MLSA) of core genes including 16S rRNA, *recA, glnII, gyrB, atpD* and *dnaK*. Sequence analysis of *nodA* and *nifH* genes along with tests for symbiotic effectiveness were undertaken. The MLSA grouped most test strains into several well-supported distinct positions. We found similar grouping for the *nodA* and *nifH* gene sequences of strains from Vigna unguiculata, Vigna radiata, and Arachis hypogaea where most of the test strains were clustered on one of a well-supported large branch that comprise Bradyrhizobium species from the tropics. Similarly, the *nodC* and *nifH* gene sequences of strains from C. arietinum showed a monophyletic origin and related to a clade representing three symbiovars. The symbiotic effectiveness of selected test strains revealed the presence of highly effective nitrogen fixers. It was concluded that Ethiopian soils are a hotspot for rhizobial diversity. This calls for further research to unravel as yet unknown rhizobia nodulating legumes growing in the country. In this respect, prospective research should also address the mechanisms of symbiotic specificity that could lead to high nitrogen fixation for legume production that could help to sustainably intensify cropping systems.

***References:***

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[2] Gunnabo A.H. et al, Phylogeography and Symbiotic Effectiveness of Rhizobia Nodulating Chickpea (Cicer arietinum L.) in Ethiopia, Microbial Ecology, 2021.