

**IFLRC N Fixation and Plant Nutrition**

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11:00-11:30 Presenter: Endalkachew Wolde-meskel (Hawassa University, Ethiopia)

**Exploiting indigenous rhizobial biodiversity resources and symbiotic N<sub>2</sub>-fixation to benefit small-holder farmers: the case of Ethiopia**

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Rhizobia are key resources as they strongly contribute to the nitrogen budget in many agricultural systems due to their nitrogen fixing capacity. Through North-South collaborative projects during last decade, we have isolated a large number of rhizobia (>500 strains) from different legume species growing in diverse agroecological zones in Ethiopia. Phylogenetic analyses revealed that the bulk of the Ethiopian strains are distinct from the hitherto known taxa of the family Rhizobiaceae. Recently, several new genospecies within this collection have been reported, including seven novel lineages within *Ensifer*, four within *Rhizobium* and three new species within *Mesorhizobium* (*M. hawassense*, *M. shonense*, *M. abyssinicae*). Cross inoculation experiments in the greenhouse and farmers' fields, involving inoculation treatments on shrub and crop legumes indicated that some of the indigenous isolates excel (over +N control, elite national and imported inoculum strains) in their symbiotic performances. Also, "need for inoculation" studies indicated that legume crops markedly differ in their nodulation at various locations, demonstrating differences in the occurrence of compatible rhizobia at various locations and benefits from inoculation. These results, while suggesting the enormous untapped rhizobial resources resident in Ethiopian soils, indicate ample opportunities for selecting elite strains to enhance effective *Rhizobium*-legume symbiosis in agro-ecosystems. This work has formed the basis for expansion of N2Africa ([www.n2africa.org](http://www.n2africa.org)) and intensification of efforts to enhance symbiotic nitrogen fixation in the farming systems of Ethiopia.