

Identification of symbiotic nitrogen-fixing bacteria from three African leguminous trees in Gorongosa National Park

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Abstract

The [symbiosis](#) between [leguminous plants](#) and symbiotic [nitrogen-fixing bacteria](#) is a key component of [terrestrial ecosystems](#). Woody [legumes](#) are well represented in tropical African forests but despite their ecological and [socio-economic](#) importance, they have been little studied for this symbiosis. In this study, we examined the identity and diversity of symbiotic-nitrogen fixing bacteria associated with [Acacia](#) xanthophloea, *Faidherbia albida* and [Albizia](#) versicolor in the Gorongosa National Park (GNP) in Mozambique. To the best of our knowledge, this is the first report on the identity of symbiotic-nitrogen fixing bacteria in this region. 166 isolates were obtained and subjected to molecular identification. BOX-A1R PCR was used to discriminate different bacterial isolates and PCR-sequencing of 16S [rDNA](#), and two [housekeeping genes](#), *glnII* and *recA*, was used to identify the obtained bacteria. The gene *nifH* was also analyzed to assess the symbiotic capacity of the obtained bacteria. All isolates from *F. albida* and *Al. versicolor* belonged to the [Bradyrhizobium](#) genus whereas isolates from *Ac. xanthophloea* clustered with [Mesorhizobium](#), [Rhizobium](#) or *Ensifer* strains. Soil chemical analysis revealed significant differences between the soils occupied by the three studied species. Thus, we found a clear delimitation in the rhizobial communities and soils associated with *Ac. xanthophloea*, *F. albida* and *Al. versicolor*, and higher rhizobial diversity for *Ac. xanthophloea* than previously reported.