

Bacterial community diversity in the rhizosphere of nickel hyperaccumulator plant species from Borneo Island (Malaysia)

ABSTRACT

The Island of Borneo is a major biodiversity hotspot, and in the Malaysian state of Sabah, ultramafic soils are extensive and home to more than 31 endemic nickel hyperaccumulator plants. The aim of this study was to characterize the structure and the diversity of the rhizosphere bacterial communities of several of these nickel hyperaccumulator plants and factors that affect these bacterial communities in Sabah. The most abundant phyla were *Proteobacteria*, *Acidobacteria* and *Actinobacteria*. At family level, *Burkholderiaceae* and *Xanthobacteraceae* (*Proteobacteria* phylum) were the most abundant families in the hyperaccumulator rhizospheres. Redundancy analysis based on soil chemical analyses and relative abundances of the major bacterial phyla showed that abiotic factors of the studied sites drove the bacterial diversity. For all *R. aff. bengalensis* rhizosphere soil samples, irrespective of studied site, the bacterial diversity was similar. Moreover, the *Saprospiraceae* family showed a high representativeness in the *R. aff. bengalensis* rhizosphere soils and was linked with the nickel availability in soils. The ability of *R. aff. bengalensis* to concentrate nickel in its rhizosphere appears to be the major factor driving the rhizobacterial community diversity unlike for other hyperaccumulator species.