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NICKEL DRIVES THE BACTERIAL COMMUNITY DIVERSITY IN THE RHIZOSPHERE OF THE HYPERACCUMULATOR *ALYSSUM MURALE*

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Serpentine (ultramafic) soils display high concentrations of nickel (Ni). Nickel hyperaccumulators have evolved on such environments, developed physiological adaptations to metals (concentrations of Ni sometimes above 1% in plant aerial biomass) and can be used for phytomining. Rhizosphere bacterial communities associated with Ni-hyperaccumulator plants differ from those of non-accumulating plants growing at the same site, and are also characterised by a higher number of Ni-tolerant bacteria. *Alyssum murale*, a Ni-hyperaccumulator, is commonly found on ultramafic soils around the Mediterranean. For a more efficient phytomining, we should characterize rhizosphere microorganisms of these plants, to find good indicators for the success of Ni extraction and to select interesting PGPR.

However, most studies have focused on analyzing soils with techniques that provide little detail about the phylogenetic structure of the bacterial communities. *Alyssum murale* can grow on non-ultramafic soils as well, with an altitudinal extension ranging from sea level to 2000 m.a.s.l. Among edaphic factors that could influence the phylogenetic structure of the bacterial communities, altitude and Ni bioavailability could be significant. Our objectives were to understand the specific changes in the structure of *A. murale* rhizosphere bacterial community that occur across two gradients: 1) elevation and 2) bioavailable Ni. We used pyrosequencing technique (454-pyrosequencing of 16S rRNA gene) to characterize bacterial communities in soils from *A. murale* rhizosphere.

On one hand we found a high proportion of *Chloroflexi* (greater than 50%). Moreover, the higher the soil Ni contents, the more the relative abundance of *Proteobacteria* and *Actinobacteria*. On the contrary, the abundance of TM7 decreased with increasing levels of bioavailable Ni. On the other hand, we screened Ni-resistant bacteria having 1-aminocyclopropane-1-carboxylate deaminase (ACCd) activity for developing primers targeting the *acdS* gene. Quantification of ACCd activity- which is known to stimulate the growth of *A murale*- directly from soil DNA extracted could be an appropriate tool to predict phytomining efficiency.

KEYWORDS
Nickel, Hyperaccumulator, bacterial diversity, rhizosphere, pyrosequencing