

Biodiversity of Mycorrhizosphere Bacteria Associated to Endemic *Tristaniopsis* Species in New Caledonian Serpentine Soils

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Abstract :

New Caledonian serpentine (ultramafic) outcrops are metal-rich soils, containing high levels of toxic heavy metals particularly the nickel (20 g.kg⁻¹). These are deficient in essential elements like carbon, nitrogen, phosphorous, and have high Mg-Ca ratio, resulting in altered structure of soil microbial communities. The effect of ultramafic soils on ectomycorrhiza and mycorrhizosphere bacterial diversities as well as on their genetic determinants of adaptation to Ni associated to widespread *Tristaniopsis* spp. has been investigated for first time. About 200 ectomycorrhizas were sampled from four different ultramafic sites (3 in Koniambo and 1 in Desmazures forest) vs two non-ultramafic ones from volcano-sedimentary soils (Arama). Molecular characterization of fungi (through partial sequencing of the ITS rRNA gene) and related bacteria (through 16S rRNA sequencing) revealed the presence of different dominant fungi (*Pisolithus albus*, *Russula* spp., *Boletellus* spp.) and bacteria (*Burkholderia* spp., *Bacillus* spp., *Pseudomonas* spp.). However, bacteria isolated from ultramafic soils could grow in the presence of Ni up to 20 mmol L⁻¹, exhibited P-solubilizing, contained *cnrT* and *nreB* genes, known to confer heavy metal tolerance, contrary to bacteria isolated from non-ultramafic soils, likely indicating their adaptation to ultramafic soils and would help in the understanding of plant functioning on these mine sites.

In : International Mycological Congress IMC9, The Biology of fungi, 2010/08/01-06, Edinburgh, United Kingdom.