The geomicrobiology of cobalt in soils from tropical ecosystems in the Santa Elena Península, Costa Rica

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Costa Rica is a country in Central America known as one of the most biologically diverse sites in the world with 4% of the total biodiversity on Earth. The Santa Elena Península is in the north-western part of the country and is a section of the Área de Conservación Guanacaste (Guanacaste Conservation Area, ACG) declared as a World Heritage by UNESCO in 1999, due to its significant relevance in developing ecological and biological processes. The peninsula is mainly conformed by the Santa Elena Ophiolite, composed of serpentinized peridotites (lherzolites, harzburgites and dunites) with mafic dikes of diabase that intrude into the peridotites[1], and principally covered by one type of Entisol and two types of Inceptisols. Over them lies one of the best preserved tropical dry forest ecosystems in the world, divided into two vegetation macrotypes.

The principal aim of this research is to study the biogeochemical cycling of cobalt and other trace elements in the soils of the Peninsula of Santa Elena, and improve our understanding of the geological origin of the soils, and critical controls on the soil microbial community within. More widely, this research will contribute to a better understanding of the presence of cobalt in natural environments, and how microbial processes may affect its solubility.

Geochemical and mineralogical analyses of samples collected along the Peninsula including, XRD and XRF, will be presented. Those results will be discussed in terms of their geographical distribution and their relationship to the underlying geology and key biological factors.

[1] Madrigal, Gazel, Denyer, Smith, Jicha, Flores, Coleman & Snow (2015), *Lithos* 230, 189–205.