O4-05 – S4 *Termites, earthworms and tropical soils: their diversity and conservation*
Monday 20 June 20 / 11:00-15:30 – Sully1

Phylogenetic assessment within a complex of tropical peregrine species, Pontoscolex corethrurus

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Background: Earthworms are among the most important soil animals in terms of biomass and activity. However, despite their importance, they suffer from a strong taxonomic deficit. It exists more tropical than temperate earthworm species, but it is interesting that the proportion of peregrines is much higher among temperate species (Hendrix et al., 2008). Moreover, recent use of molecular approaches has shown that already described species comprise several different genetic lineages, which may represent cryptic species. These cryptic lineages could differ in their biological and ecological features. One of the most distributed earthworm species in tropical region is Pontoscolex corethrurus. Although this species is one of the most studied earthworm species in soil science, little is known about its genetics except that a cryptic lineage has been found on Azores Island (Cunha et al., 2014). The aims of this study were (i) to describe the genetic variation within P.corethrurus, (ii) to investigate the relationship between different genetic lineages, and (iii) to characterize morphological differences among these lineages.
Method: Samples were collected by soil macrofauna specialists from all over the world and were analyzed using mitochondrial (16s and COI) and nuclear (ITS2 and 28s) molecular markers. Phylogenetic trees were produced by Bayesian and maximum likelihood methods. From each divergent lineage at least 2 individuals were morphologically analyzed, looking at (i) the regularity, shape and arrangement of the setae on tail, (ii) the number of clitellum segments and the tubercula pubertatis position and (iii) the presence or absence of seminal vesicles.
Results: Genetic divergence between lineages and observed morphological differences, showed that this dataset gather 9 divergent lineages. Among them, 5 lineages present morphological differences and are likely different species while no morphological difference was observed for the 4 other lineages which could represent cryptic species.
Discussion/Conclusion: Based on these results, it is possible that till now, other species have been mistaken for P.corethrurus, and we highlight the necessity to check the taxonomic status of Pontoscolex sp. specimens using molecular markers before including them in a scientific study. In the future, a meta-analysis of the literature could emphasize the possibility that different species or cryptic lineages have been erroneously identified as Pontoscolex corethrurus.

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Origin and dynamic of cathedral and lenticular mounds in Southern Indian forests

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Termite mounds are not only conspicuous features of African landscapes. In southern India, two types of above-ground termite mounds are commonly observed in forests. The first category corresponds to cathedral mounds (Ob) and the second to lenticular mounds (DOM). If Ob mounds are built by the fungus-growing termite species Odontotermes obesus, the origin and evolution of DOM mounds remains unknown. This presentation investigates the functional impact, origin and dynamic of these two types of termite mounds in two different soil environment (vertisol vs. ferralsol). Ob and DOM mound densities reach approximately 3.5 and 13 mounds ha-1, respectively, which corresponds to an average volume of soil of about 40 m3 ha-1. Using soil physical, chemical and mineralogical properties, we show that the two types of termite mounds are made of soil collected at approximately 20 and 30 cm deep and we highlight gradient in soil properties from Ob to DOM, suggesting three possible scenarios: (1) a progressive erosion of Ob that leads to the recovery of soil properties similar than those observed in the surrounding environment (CTRL); (2) utilization of Ob mounds by other termite species, thus forming DOM mounds, which acquire very different soil properties than CTRL in increasing in size; and/or (3) the formation of DOM mounds from CTRL, independently from Ob. In conclusion, the soil type (ferralsol vs. vertisol) has no influence on the origin and dynamic of Ob and DOM mounds. This study also highlights that the fate of Ob and DOM mounds can be complex, and that more data and especially long term databases are needed for determining the origin and evolution of termite mounds.