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► To cite this version:

Alain Brauman, Laurent Philippot, Ezékiel Baudoin, Djibril Djigal, M. Gueye, et al.. Is soil fauna an important driver of key soil function? the case of denitrifier communities in tropical soils. ISME 12. International Symposium on Microbial Ecology, Aug 2008, Cairns, Australia. 1 p., 2008. hal-01190316

HAL Id: hal-01190316

<https://hal.science/hal-01190316>

Submitted on 6 Jun 2020

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Poster Presentation

Session Title: The Living Soil

Presentation Date: Monday, August 18, 2008

Poster Board Number: 0228

IS SOIL FAUNA AN IMPORTANT DRIVER OF KEY SOIL FUNCTION ? THE CASE OF DENITRIFIER COMMUNITIES IN TROPICAL SOILS

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According to recent estimations, soil animals represent as much as 23% of the total diversity of living organisms. If the importance of soil fauna on soil global microbial processes like mineralization is widely recognized, their impact on composition of soil microbial guilds, like denitrifiers, remains questionable. This study will resume several works undertaken on the influence of keystone tropical soil species (nematodes, termites, earthworms) on different parameters (activity- density and genetic structure or diversity) of the denitrifying bacterial communities. In order to take into account the main different interactions between fauna and microorganisms, the exposed studies focus on bacterial-feeding nematodes (grazing effect) earthworms and termites (engineering effect ; modification of soil structure and/or physico-chemical properties). Their respective impact was measured on the activity (potential denitrification activity), genetic structure (fingerprinting and cloning sequencing) and density (real time PCR) of the targeted functional communities. The soil feeding termite mound is characterized by an increase in the denitrification potential activity and shift in the diversity of the nitrate reducers performing the first step of the denitrification process with enrichment of actinomycetes. Contrarily, earthworms reduced the soil potential denitrification activity but do not modify composition nor density of the denitrifier community. The inoculation of the nematodes led to a decrease in the potential denitrifying activity and a slight modification of the genetic structure of the denitrifier community. These results underline that besides the plants, soil fauna represent also a key factor of regulation of the functional soil microbial activities.