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Title:

Soil microbial diversity and related soil functioning in urban parks

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Several ecosystem services are provided by ecosystem functioning and especially soil functions. The main thrust of this work was to improve the knowledge concerning soil biodiversity and related ecosystem services in soils from urban parks in several cities of the Région Centre, Orléans. The biodiversity of urban soils and the drivers that control this biodiversity are in fact poorly known. Moreover information on the functioning soils of urban parks is rare and even poorer concerning the link between these soils and their biodiversity.

In this work, the pedological, geochemical and microbiological characteristics of surface soils were investigated in order to make an inventory of soil fertility in several urban parks of the major cities of the Région Centre, France. The effects of agricultural practices on biomass, community structure and activity of micro-organisms were investigated in these soils in parallel with the determination of various pedo-physical and chemical parameters.

We determined the microbial biomass and community level physiological profiles (CLPP) by using the MicroRespTM system in topsoils. The soil samples were also evaluated for soil physico-chemical characteristics such as the in-situ moisture content, organic carbon and nitrogen concentrations, conductivity and pH together with their structure and texture and other soil physical parameters. Except for one site it appears that the microbial biomass for all samples was high. Metabolic quotients (qCO₂) were in contrast variable for the different parks whether Shannon diversity index were quite similar for all the samples.

Results from this study showed that the soil ecosystem have significantly influenced the functions of soil microbial community and hence probably its composition. More generally, catabolic diversity of soil microbial community is variable under the influence of various cultural practices and geological contexts.