EFFECT OF PHYSICO-CHEMICAL CHARACTERISTICS OF AGRICULTURAL SOILS ON FUNGAL BIOMASS – CASE OF MEADOW AND CROP

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The fungal biomass, FB, is used as a biomarker to assess the soil fertility and to supervise the effects of an environmental pollution. The principal membrane sterol of most fungi is the ergosterol. It is generally used to estimate the living FB. Our aim is to be able to use this biomarker like an indicator of change of the agricultural practices.
We have optimized certain techniques of extraction (Montgomery, 2000 & Gong, 2001) based on two approaches: 1 mechanical perturbation, 2: saponification with Micro-waves Assisted Extraction. The first technique shows weak concentrations in biomass which correspond to the free ergosterol and the MAE technique shows the most important quantities in FB which represent the total ergosterol (free and esterified).

We tried to emphazise the influence of physico-chemical characteristics on the FB content and its evolution. We are working on two types of agricultural soils: a permanent meadow and a field crop located in the same place in Normandy.

Nevertheless, the interpretation of the results obtained using these comparisons is often difficult in the case of soil micro-organisms (the main actors of soil functioning) and can be in many cases non-conclusive. It is especially true regarding cultivated soil ecosystems because of numerous pedoclimatic and environmental situations, agricultural practices… However, we can propose some trends: FB is well correlated with the carbon, apparent density and clay fraction. pH and nitrogen are two parameters important for the FB.