



## **A fast and sensitive method to determine the fungal biomass in the agricultural soils.**

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The fungal biomass 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 for estimating the living fungal biomass.

Our aim is to be able to use this biomarker like an indicator of change of the agricultural practices.

We tried to optimize certain techniques of extraction, while basing ourselves on common methods.

We based ourselves on two techniques: without and with saponification [1,2].

The traditional technique shows very few differences in the quantities of ergosterol in the various examined agricultural soils.

We applied a mechanical agitation associated to a treatment of microwave during the extraction phase.

This method is fast and extract up to 10 times more soil ergosterol than the classical method without saponification. Soil ergosterol is quantified rapidly (<10min) by HPLC. All the extracts were examined with DAD and the chromatographic conditions were optimized. This method recovered an average of 92% ( $\pm 9\%$ ) of the ergosterol added to soils prior treatment. The sensitivity of the method can go until 0,5ppm of ergosterol per gram of dry soil.

Moreover, there are significant differences of fungal biomass between soils of the same type, but cultivated differently.

Keywords: Ergosterol, fungal biomass, agricultural soils, biomarker

[1] Gong P., Witter E., A rapid method to extract ergosterol from soil by physical disruption, *Applied Soil Ecology*, 17 (2001) 285-289.

[2] Montgomery H.J., Monreal C.M. et al., Determination of soil fungal biomass from soil ergosterol analyses, *Soil Biology and Biochemistry*, 32 (2000) 1207-1217.