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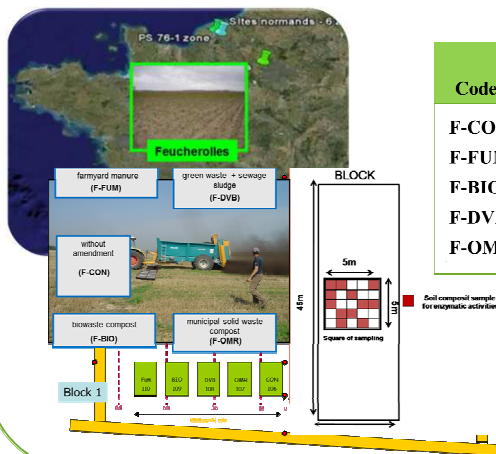
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INTRODUCTION

- ✓ The available indicators to evaluate the soil state are essentially based on physico-chemical parameters, however these parameters are not always representative of soil biological functioning.
- ✓ The aim of this work is to evaluate the potential of soil enzyme activities as suitable indicators of soil state according to organic amendment inputs ?

MATERIELS AND METHODS

1. Site selection: QualiAgro-Feucherolles site is located in north-western of France (oceanic climate) including 5 plots with different organic inputs in soil. At the date of sampling, soils were cultivated with wheat. The last inputs have been made 18 months ago the sampling date.



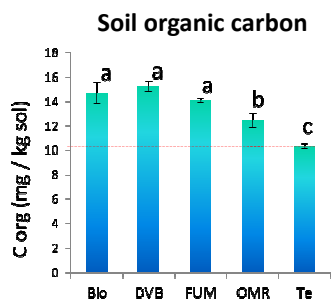
Code	Description
F-CON	Crop without amendment (control)
F-FUM	Crop with residual organic products
F-BIO	Crop with biowaste compost
F-DVB	Crop with residual organic products
F-OMR	Crop with municipal solid waste compost

2. Enzymes activities assays : 13 enzymes activities were determined on fresh sieved (<2 mm) soil

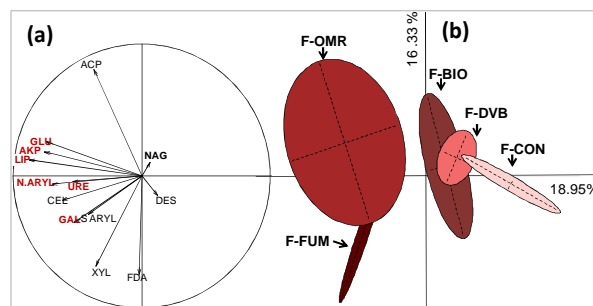
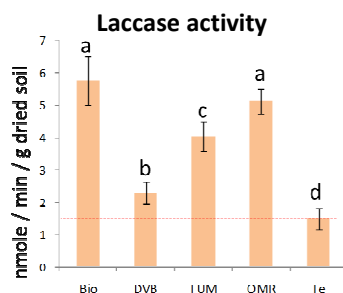
Enzymes	Codes	References
Dehydrogenase	DEH	Schaefer et al, 1963
Fluorescein diacetate	FDA	Adam & Duncan, 2001
Lipase	LIP	Gupta et al, 2002
Cellulase	CEL	Trap et al, 2012
Galactosidase	GAL	Eivazi & Tabatabai, 1988
N-acetyl glucosaminidase	NAG	Trap et al, 2012
Xylanase	XYL	Schinner & von Mersi, 1990
Arylsulfatase	ARYLS	Tabatabai & Bremner, 1970
β-glucosidase	GLU	Eivazi & Tabatabai, 1988
Urease	URE	Sinsabaugh et al, 2000
Arylamidase	ARYLN	Martinez & Tabatabai, 2000
Acid phosphatase	ACP	Trap et al, 2012
Alkaline phosphatase	AKP	Trap et al, 2012

RESULTS & DISCUSSION

Do enzyme activities revealed changes in the biological functioning of soils caused by organic amendments inputs?



Different superscripts [a, b, c] indicate significant differences ($p < 0.05$ or less) between inputs



Principal component analysis (PCA) of enzyme activities from non-amended and amended soils. (a) Correlation circle of enzymatic activities, (b) Factorial projection of axis 1-2 of plots

- ✓ The addition of organic amendments for 10 years induced the increase of soil organic carbon content plots enriched with organic amendment regarding the control.
- ✓ The variation pattern of laccase activity is different from those observed for soil organic carbon content.

- ✓ AKP, URE, ARYL, GAL, NAG, β-GLU and LIP enzymes activities revealed significant differences for plots enriched with organic amendment regarding the control.

These results suggested that enzyme activities in soil could be related to the biochemical quality of organic amendments inputs

CONCLUSIONS

- ✓ These results suggest also that soil organic carbon content affect soil biodiversity and function and consequently ecosystem services.
- ✓ Several enzyme activities were sensitive to soil organic carbon content, and they are probably indicators of carbon quality in soil