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DYNAMICS OF SOIL BACTERIAL POPULATIONS INVOLVED IN DEGRADATION OF ^{13}C-LABELLED WHEAT, RAPE AND ALFALFA RESIDUE AS ESTIMATED BY DNA-SIP TECHNIQUE

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In regard to the importance of Soil Organic Matters (SOM) for many of the soil properties plant productivity depends upon, the preservation and the improvement of SOM content is of central importance for the maintenance of agrosystems productivity. In this context, soil amendment with plant residues is a common agricultural practice to compensate the mineralization of SOM consecutive to arable farming. However, a mismanagement of those organic inputs can also induce negative effects for environment quality in terms of eutrophisation and/or greenhouse gaz emission.

Accumulation of SOM depends greatly from the activity of soil heterotrophic microorganisms responsible for the transformation of crop residues to complex and stabilized organic compounds. In spite of its major role in organic matter degradation processes, the microbial component involved is still poorly documented, particularly in terms of populations and functions. In this context, progresses have to be made to elucidate the interactions between the diversity of soil microorganisms and the dynamics of SOM, which should constitute a decisive step forward the improvement of organic inputs management.

We performed a microcosms experiment in order to, (i) characterize the diversity and the dynamics of the bacterial communities actively involved in the degradation of crop residues, (ii) evaluate the influence of the biochemical quality of the crop residues on the diversity of the degrading microorganisms, and (iii) evaluate the link between the dynamics of the diversity of microbial communities and the fate of crop residues added to soil in terms of mineralisation *versus* storage.

Wheat, rape and alfalfa residues labelled at more than 90% ^{13}C were incorporated into soil microcosms and incubation was conducted over a 120-day period. The dynamics and the diversity of bacterial populations actively assimilating C derived from each crop residues were assessed over the time course of the experiment using the DNA-SIP (Stable isotope Probing) approaches. In parallel, $^{12}CO_2$ and $^{13}CO_2$ fluxes were monitored in each condition to assess the mineralization of each residue added to soil and to evaluate the impact of crop residues incorporation on SOM content through the calculation of the "priming effect" process induced.