



Priming effect of pyrogenic carbon on soil organic matter and soil litter: facts, paradoxes and gaps in knowledge.

Samuel Abiven, Nimisha Singh, and Bernardo Maestrini

Soil Science and Biogeography, Department of Geography, University of Zurich, Winterthurerstrasse 190, CH 8057 Zurich, Switzerland (nimisha.singh@geo.uzh.ch)

The interest in Pyrogenic Carbon (PyC - residue of an incomplete pyrolysis of the vegetal biomass) stability in the soil has been rising lately, particularly in relation with carbon (C) budget estimation in the soil and with the behaviour of PyC application into agricultural soils (biochar). However, recent literatures have questioned the concept of its stability as evidenced by its significant losses due to degradation from terrestrial system. Moreover, certain authors described a priming effect of PyC on soil organic matter [1] or litter [2], i.e. an increase of the native organic matter mineralization affected by PyC treatment in the soil. This would lead to the reconsideration of PyC potential to act as C sink.

On the other hand other incubation studies report no priming effect in litter+PyC mixture [3] or on soil organic matter [4]. The quantitative importance of this priming effect on the total C fluxes is not really established yet, but its magnitude might be such that it can offset the quantity of PyC added to the soil in field experiments [5].

This communication will review what is known about priming effect of PyC on soil organic matter and litter through a literature review and experimental data (incubations and field set up). The mechanisms underlying priming effect proposed in literature will be reported to the case of PyC as primer substrate. Particular emphasis will be given to the microbial nutrient limitation theory as proposed by Blagodatskaya [6, 7] and to possible counter-measure to reduce priming effect as the concurrent addition of N and PyC to the soil.

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