Geophysical Research Abstracts,
Vol. 11, EGU2009-5260, 2009
EGU General Assembly 2009

Aggregates dynamic in contrasting soils with different fertilizations and role of humic carbon as binding agent

e lugato (1), g simonetti (1), s nardi (2), a berti (1), l giardini (1), and f morari (1)

(1) Dipartimento di Agronomia Ambientale e Produzioni Vegetali, Agripolis, Università di Padova, viale dell'Università 16, 35020, Legnaro (Padova), Italy (francesco.morari@unipd.it), (2) Dipartimento di Biotecnologie Agrarie, Agripolis, Università di Padova, viale dell'Università 16, 35020, Legnaro (Padova), Italy

In the last years aggregates fractionation has become a very common approach to study the close linkage between aggregate formation and SOM turnover. According to the hierarchical theory microaggregates are assumed to be stabilized by persisting binding agents whereas macroaggregates by transient or temporary organic materials. Humic substances, considered to be recalcitrant, should likely act as persistent binding agents but their role, also because of their heterogeneity and discussed origin, is still unclear. In a long-term experiment established in the early 1960s in north-eastern Italy, we wet-sieved large macroaggregates to separate three aggregate sizes (2000-250 mm, 250-53 mm and <53 mm) in contrasting soil (clay, sandy and peaty), fertilized with manure and mineral fertilizers. We analysed organic (OC) and humic (HC) carbon of each aggregate fraction, also investigating the molecular weight of the humic substances extracted (>60 KDa,60-30 KDa, <30 KDa). The aim were to evaluate the effect of the different fertilisations type in the aggregate and organic matter distribution and investigate the composition and role of HC as binding agent. The results evidenced that the addition of manure significantly increased the proportion of macroaggregates respect to the mineral fertilization but only in the clay soil. Aggregate hierarchy, according to which SOC concentration increase with increasing aggregates size, was generally supported by our data. The HC values followed the same pattern of the OC, with a very high correlation between these parameters (r >0.95). The HC/OC ratio, ranging narrowly among the aggregates fractions, indicated no hierarchical role of HC as persisting binding agents. However HC extracted in the silt-clay fraction showed higher proportion of low molecular weight fraction in peaty and clay soil, respect to HC of larger aggregates.