



Micromorphological Aspects of Forensic Geopedology II: Ultramicroscopic vs Microscopic Characterization of Phosphatic Impregnations on Soil Particles in Experimental Burials

S.I.E. Ern (1,3), L. Trombino (1,2), and C. Cattaneo (3)

(1) Earth Sciences Department, Università degli Studi di Milano, Milano, Italy, (2) National Council of Research, Dynamic of Environmental Processes Institute, Milano, Italy, (3) Legal Medicine Institute, Università degli Studi di Milano, Milano, Italy

Grows up the importance of the role played by soil scientists in the modern forensic sciences, in particular when buried human remains strongly decomposed or skeletonized are found in different environment situations. Among the different techniques normally used in geopedology, it is usefull to apply in such forensic cases, soil micromorphology (including optical microscopy and ultramicroscopy) that has been underused up today, for various kind of reasons.

An interdisciplinary Italian-team, formed by earth scientists and legal medicine, is working on several sets of experimental burial of pigs and piglets in different soil types and for different times of burial, in order to get new evidences on environmental behaviour related to the burial, focalising on geopedological and micropedological aspects.

The present work is focused on:

- ultramicroscopic (SEM-EDS) characterization of the phosphatic impregnation (by body fluids) on soils sampled under the dead bodies of five couples of pigs, buried respectively for one month, six month, one year, two years and two years and half in two different areas;
- microscopic (petrographic microscope) and ultramicroscopic (SEM-EDS) cross characterization of the phosphatic impregnation (by body fluids) on soils sampled under the dead bodies of several piglets, buried for twenty months.

The first results show trends of persistency of such phosphatic features, mainly related to the grain size of the impregnated soil particles and weather conditions (or seasons) of exhumation, while apparently time since burial is only marginally effective for the investigated burial period.

Further experiments are in progress in order to clarify the pathways of phosphorus precipitation and leaching for longer times of burial and different seasons of exhumation, both from the microscopic and the pedological/chemical point of view.