



Soil mineralogy in two apple-orchards, Fălticeni and Sârca (Moldavian Platform)

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Abstract

The present paper is focused on the mineralogical analysis of soils from two apple orchards (Fălticeni and Sârca) from the North-Eastern region of Romania, geologically located on the Moldavian Platform. 20 samples have been analysed from both areas (11 from Fălticeni and 9 from Sârca), through SEM-EDS and XRD (powder method). The main minerals which were identified are quartz, feldspar, illite and partially calcite. As secondary minerals and trace minerals, chlorite, smectite, glauconite, kaolinite, pyrite, apatite and oligoclase were also identified. Generally, the most abundant mineral is quartz and while for the Sârca area illite is present in notable quantities, in the samples taken from Fălticeni, calcite was identified as a main mineral alongside quartz.

The main factor which controls the distribution of minerals within the soils from the two orchards is the geological substratum. The results, correlated with the geochemistry of the soils reveal differences between the soils from the two areas, in matters of their ability to bond certain microelements, especially those with a notable toxic potential, as a function of their mineralogical composition. The principal components' analysis suggests that the distribution of microelements is controlled by the presence of clay minerals, oxides and amorphous material, while Cu points towards an anthropic origin due to agricultural practices.

Keywords: soil mineralogy, SEM-EDS, XRD, apple-orchard, Fălticeni, Sârca.