



Mineralogy and geochemistry of andosols from Gurghiu mountains (Part I)

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Have been studied 13 andosol samples from two profiles (Gurghiu Mountains), from chemical and mineralogical point of view. The field surveys and chemical-mineralogical analysis have evidenced that the andic character of studied soils, the andesitic nature of parental material by eruptive type and a different spatial distribution of andosols towards to the underlined in previous studies. The andosols from Gurghiu Mountains have been formed on andesitic material arise from two sources, in two successive steps: (i) in first step on basis of piroclastes materials (ash and volcanic glass), (ii) in second step on basis of andesitic agglomerates. The frequent occurrence form of piroclastes in studied andosols (> 90 %) is the granules associated with other mineral and organic components: (i) macroscopic associations (agglomerates) and (ii) colloidal microscopic associations (macromicelles). Over 80 % from amorphous clay minerals (imogolite, allophane) and from humus are included in allophano-humic associations. The structure and the ratio between the components of allophano-humic complexes varied in function of allophanic or non-allophanic character of andosols. Another characteristic of these andosols is the existence of two types of allophanes and the specific way of association of these with humus and other mineral components of andosols: (i) allophone I (aluminous) characteristic to the non-allophanic andosols and (ii) allophone II (siliceous) characteristic to the allophanic soils. Between these two forms of allophane is a dynamic equilibrium, conditioned by pH, organic matter content and thermodynamic activity of Al, Si and Fe. The transformation of allophane I in allophane II is accompanied by the retention of organic matter in allophanic-humic complexes, this having a protector role for allophane. At pH values lower than 5, the organic matter manifest and an anti-allophanic effect, which is traduced by destabilization of allophanic-humic associations, with the formation of metal (Al, Si) – humus complexes. In case of studied andosols the anti-allophanic effect is relative intense and has a regular character, dependent by the physic-chemical conditions from soil.