



## **Kaolin group minerals in buried paleosols of Nevado de Toluca, Central Mexico.**

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Volcanic paleosols could contribute to the paleoenvironmental reconstructions at different time scales, although their interpretation meets with some difficulties, related to their pedogenetic specialty and their specific evolutionary pathways. The Nevado de Toluca tephra-paleosol series provides a valuable paleopedological record of Late Quaternary environmental history of Central Mexico. According to an evolutionary sequence the studied soils represent the following row: modern Andosol → buried Cambisol → Intergrade Andosol → Luvisol. This research is devoted to studying the mineral composition of the clay-size fraction and features of the clay minerals particles by XRD and TEM with local chemical analyses methods in these sola.

The kaolinite particles are platy, halloysite are tubular as well as spheroidal. The mineral composition of sola changes from (i) allophane dominance in modern Andosol → (ii) poor crystallized spheroidal halloysite (aggregates and unit particles) in buried Cambisol → (iii) mostly spheroidal halloysite and tubular one with a small content of kaolinite are present in Intergrade Andosol → (iv) in Luvisol halloysite (spheroidal and tubular particles) and platy kaolinite are approximately in the same content.

We believe that in the studied soils changing of the mineral composition of clay size fraction from allophane to kaolinite takes place through the halloysite stage. On the first step of halloysite formation the particles of this mineral have spheroidal form and then the value of tubular ones increase. This imagination is in accordance with the literature data. It was suggested that the form of particles is a result more from conditions of weathering than the nature of origin material. So the presence of spheroidal halloysite in the all sola, except modern Andosol, could be the illustration of the same environment during the weathering and mineral formation. Kaolinite appearance in

the solum takes place as a result of time and soil development and evolution.