

MINERALOGY OF FINE-GRAINED QUATERNARY SEDIMENTS OF HUNGARY COVERING SURFACES IN MOUNTAINOUS AND HILLY REGIONS

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In this review data on clay mineralogy of clay- and silt-size sediments are collected from scattered publications and unpublished laboratory reports of the Hungarian Geological Institute. Mineralogical data were compared with geological results relating age, palaeoclimatic and palaeoenvironmental conditions of deposition. In this review mainly the northern and Transdanubian areas of the country were considered.

There are two typical compositions of **red clays** covering **karst surfaces** of North Hungarian and south Transdanubian mountains. Older (Pliocene to Lower Pleistocene) clays contain *disordered kaolinite* indicating warm and humid climatic conditions while younger (Lower Pleistocene) sediments contain dominantly *illite* and *smectite* indicating warm and arid conditions. Multiple redeposition of older (Cretaceous and Tertiary) continental sediments is possible, which may confuse age relations and palaeoclimatic interpretation.

In north Hungarian **volcanic** mountains **red clays** and "**nyirok**" (**loam**) contain dominantly *smectite* derived by weathering or inherited from the alteration products of the underlying volcanic rocks (in the Mátra Mts. *smectite* is of *low-charge beidellite* type). In the foothill areas (e.g. at Visonta) red clays were transported by soil creep from the mountains. They contain *high-charged beidellite* and admixture of other clay minerals of aeolian origin.

"**Reddish**" coloured Lower Pleistocene **clays** on hilly regions of SW Transdanubia and on the W margin of the Great Plain (**Tengelic Fm.**) are characterised by *high smectite* and *low carbonate* contents. In the Mórág Hills area *vermiculite* and *palygorskite* in the underlying granitic rubble indicate special Mg-rich solutions. *Mixed-layer biotite/vermiculite* derives from weathering of the biotite of granite. Intercalations of basalt tuff may contain *smectite* and *vermiculite* (at Bár, Tengelic, Görgeteg?).

In the silt-size bulk composition of **loess** the dominant clay minerals are fresh or slightly weathered detrital phases like *illite*, *chlorite* and *vermiculite*, while in the fine clay fraction *smectites* are enriched. Kaolinite is practically absent. Intercalated **palaeosol horizons** correspond most frequently to brown forest soils and forest steppe soils. During soil formation fine-grained *smectite* and to a lesser extent *kaolinite* and *vermiculite* are formed while most *dolomite* and *calcite* contents of loess are *leached out*. No weathering and *muscovite* was observed in a podzolic palaeosol from a cold interstadial period of Würm (at Tokaj). The **tuffite horizon** of "Bag Tephra" in Middle Pleistocene (Riss) loess contains fresh volcanic glass particles.