

THE MINERAL COMPOSITION OF RED CLAYS IN HUNGARY

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Red clays in Hungary are the products of soil forming processes of Tertiary period and so were not covered by marine sediments.

Basic soil investigations and mechanical analysis (Fekete et al., 1997) were carried out on the red clay samples (Fekete and Stefanovits, 2002; Fekete, 2002). X-ray diffraction and (derivatographic) thermal analysis were applied to determine the mineral composition of the samples by G. Bidló and P. Kovács-Pálffy.

On the basis of soil and mineral analysis these red clays can be rank in various groups:

Red clays in Transdanubia are:

1. The red soils of western periphery of Hungary:

a) Red soils of Kőszeg Hill. Most of the red clays are in situ old ferralitic formations.

b) Red soils of Őrség. We can find decomposed siallitic and rather old ferralitic residuum.

2. Red soils formed on Permian sandstone. It doesn't contain kaolinite and hematite, but contains goethite.

3. Bauxitic formations of Transdanubian medium high mountains:

a) Red clays in which the allite association is dominant. These soils contain high amount of boehmite, gibbsite and kaolinite.

b) Bauxitic red clays which show allitic characteristics. The amount of kaolinite and chlorite is prominent.

4. Red clays of Transdanubian Hill:

a) The red clays have been produced by weathering of Pannonian surface. We can find illite, chlorite, montmorillonite and kaolinite.

b) Red clays of Mecsek and Villányi Hill. These terra rossa formations are in the fissures of limestones.

Red clays of Northern Mountains are:

1. The red clays of Tokaj Foothills, formed on rhyolite tuff with low contain of kaolinite and 40% of montmorillonite.

2. The red soils of Cserehát and Szalonna Hills with high percentage of montmorillonite have a typical red and yellow red colours.

3. The red soils of Aggtelek Karst, Torna Hills and Bódva Valley with 40% of montmorillonite and 10% to 40% of kaolinite.

4. The red soils of Bükk Mountains with very low kaolinite contain, the percentage of illite contain is around 20% and with the very little percentage of montmorillonite.

5. The red soils of Northern periphery of the Great Hungarian Plain with significant amount of montmorillonite have a 10% to 20% of kaolinite.

Micromorphological features of clays are summarised as follows.

The speckled and granostriated b-fabric of the groundmass, whose occurrence is mainly due to swelling and shrinking, were observed in samples from the sites as follows: Gödöllő, Gyöngyöstarján, Hatvan–Gombos, Jósvafő, Kakasd, Kővágószőlős, Mád, Mátrakeresztes, Muzsla, Salgótarján, Szekszárd, Szurdokpüspöki and Valkó. Swelling was confirmed by the occurrence of stress coatings in the red clays from Jósvafő and Szurdokpüspöki.

Occurrences of clay coatings in samples of sites in Gödöllő, Hatvan–Gombos, Kővágószőlős, Mád, Muzsla, Mátrakeresztes, Salgótarján, Szurdokpüspöki and Valkó were interpreted as a micromorphological features of illuviation. The most illuviation coatings and infillings were observed in samples from Hatvan–Gombos and Kővágószőlős. Concerning micromorphological investigations thanks are due to Géza Szendrei for helping.

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