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# Pedogenic iron oxides in two Luvisols from Bulgaria, developed under continental Mediterranean climate

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Restricted area from the most south-eastern part of Bulgaria at the Bulgarian-Turkish border is characterized by continental Mediterranean climate. Peculiarity of the area is determined by the proved absence of Quaternary glaciations and predominance of Mediterranean flora (mainly oak (Fagus orientalis) with widely distributed rhododendron (Rhododendron ponticum)). Under these conditions, characteristic red colored Luvisols are developed. We have studied two profiles - Ferric Luvisol and Rhodic Luvisol - with the aim to characterize the iron oxides' mineralogy and their depth distribution. According to the carried out grain size analyses clay content varies between 11-19% in Rhodic Luvisol and between 24-34% in Ferric Luvisol, while silt content ranges between 60-80% for both profiles. Extended set of magnetic measurements includes: magnetic susceptibility and its frequency dependence, hysteresis properties, isothermal- and anhysteretic remanences; thermomagnetic analyses of magnetic susceptibility. Strong magnetic enhancement is observed in the upper soil horizons, while parent material (presented by metamorphosed sediments) is weakly magnetic. Notable difference between the two profiles is the obtained high percent frequency dependent susceptibility (10-14%) for Ferric Luvisol, while Rhodic Luvisol has only 1-2% frequency dependent susceptibility. Thermomagnetic analyses of magnetic susceptibility imply that strongly magnetic fraction is represented by maghemite and magnetite. Hematite presence anticipated by the intense red-brown colouring of the soils cannot be identified by magnetic measurements, suggesting that most probably it exists in superparamagnetic state. Instead, remanence-carrying hematite is identified in nodules from the iluvial horizon of Ferric Luvisol. Additional information from SEM observations and chemical analyses will be utilized to better constrain the mineralogy.
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