



First physical volcanological description of a Miocene, silicic, phreatomagmatic fall complex in the Carpatho-Pannonian Region (CPR)

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The study reports the basic physical volcanological and stratigraphical features of a hitherto unrecognized silicic phreatomagmatic fall succession from the Bükk Foreland Volcanic Area (Hungary), known as part of the extensive Miocene ignimbrite volcanism of the northern CPR. The complex have been identified at two sites, in the vicinity of Bogács and Tibolddaróc villages. Tens of mm to several dm thick layers make up the 20 m thick entire succession. The complex could be subdivided into three eruption cycles by two, intercalated well-developed paleosoil horizons, which indicate longer repose periods. The eruption cycles consist of several individual eruptive events. The volcano-sedimentological field approach was completed by granulometrical and low field anisotropy of magnetic susceptibility (AMS) studies. Combined dry sieving and laser diffraction particle size analysis were performed to get information on median grain size ($Md\Phi$) and sorting ($\sigma\Phi$) of friable layers. AMS was used to infer the emplacement processes. Based on the following features the succession is proposed to record a large-scale, silicic, phreatomagmatic fall activity: i) Presence of very fine ash and abundant ash aggregates, ii) General poor sorting, and often bimodal grain-size distributions; ii) Extremely weak magnetic fabric compared to dilute, thin pyroclastic density current deposits. On the basis of comparison of the recorded grain size characteristics with data from other silicic phreatomagmatic fall deposits worldwide, several units in the succession can be considered as phreatoplinian fall deposit (*sensu lato*), described for the first time in the CPR.