

Vegetation and climate history in the Carpathians during MIS 3-2 – a multi-proxy study of a sediment sequence from Mohoş crater, Romania

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We present a new record of vegetation and climate history derived from a multiproxy investigation of sediments recovered from the in-filled Mohoş crater (46°05' N; 25°55' E) located within the Ciomadul volcano complex (Romania). To date, the 30-m long sediment core, covering MIS 3 to present provides one of the longest lacustrine records from the Carpathian region. The sequence consists of an upper peat unit of Holocene age, and underlying lacustrine sediments inter-bedded with several tephra layers. Ciomadul volcano, hosting the superimposed craters of Mohoş and Sf. Ana, is the youngest volcanic edifice in the Carpathian-Balkan region. Thus, tephra-analysis on the Mohoş sediments gives valuable insights into the volcanic history of that region during MIS 3, mainly arising from the younger crater of Sf. Ana and possibly from several secondary domes. The past vegetation and climate history of the Mohoş sediment sequence has been reconstructed by applying a multi-proxy approach of lower resolution palynological analyses and geochemical, and sedimentological investigations in combination with high-resolution multi-sensor core logging and ITRAX XRF scanning. Chronological control of the sediment sequence is based on radiocarbon and luminescence dating. Palynological data yield arboreal pollen (AP) mainly consisting of Pinus, whereas Artemisia and Poaceae dominate the non-arboreal pollen (NAP). The fluctuations in the AP/NAP curve suggest marked changes in the landscape openness during MIS 3-2. All parameters exhibit a major change at the transition from peat to lacustrine sediments. Low TOC values coupled with low TOC/N ratios in the lacustrine sediments could be interpreted as reflecting limited productivity (mainly aquatic), and/or high rate of organic matter mineralisation in the water and sediment column driven by biogeochemical forcing, likely as a result of proximal volcanic activity. Based on available data, responses of this mid-altitude site (1050 m a.s.l.) to past climate oscillations since MIS 3 are discussed. We further discuss results of tephra-analyses on the Mohoş sediment record and their correlation to proximal and medial-distal pyroclastic deposits originating from this volcanic field.

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