The rock magnetism and biochronology of boundary events across the Cretaceous-Paleogene transition in Slovakia.

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Western Carpathians transitional sequence of Upper Cretaceous (e.g. Gosau Group) and Paleogene (e.g. Myjava-Hričov Group) sediments provide good premise for studying the Cretaceous-Paleogene boundary (K-Pg) as well as other end-Cretaceous to Middle Eocene events. In Slovakia, the Late Cretaceous formations of Gosau localities can be found in Brezovské Karpaty Mts, Myjava Upland and Mid Váh Valley. To gain insights to local changes in global cataclysm event, a combined study of planktonic bioevents and magnetic properties across K-Pg was studied in two Western Carpathians drilled sections, Žilina (Mid-Váh Valley region) and Kršteňany (Upper Nitra Depression).

The Žilina-Hradisko drill core (ZA-1) is 75 m long and overturned in position. The micropaleontological research of the ZA-1 drill core provides a stratigraphic data ranging from the Late Maastrichtian to Early Ypresian. The ZA-1 sequence reveals distinct changes in magnetic properties and bioproductivity, particularly at the K-Pg. Although most of the drilled sequence displays paramagnetic behavior and low remanent magnetization (average magnetic susceptibility 142μSI and NRM <1mA/m, respectively), at the K-Pg and during first half of Danian – up to base of P2 biozone, markedly higher magnetic susceptibility (MS) and NRM values were observed. This change could mostly be attributed to increased concentration of magnetic fraction and probably illustrates the paleoenvironmental changes as a result of the K-Pg event. The K-Pg interval is also marked by the presence of increased amount of superparamagnetic particles. A mixture of low and high coercivity minerals were detected throughout the drill core, with S-ratio varying between 0.2-0.9 (at K-Pg 0.6-0.9). An additional study of mercury (Hg) content, in combination with total organic carbon (TOC), of ZA-1 samples, reveals a short time enhanced (Hg/TOC >100ppb/wt%), possibly volcanogenic, Hg input during Late Maastrichtian 40cm below K-Pg and later in the second half of P1 biozone in Danian, but seems to indicate either weak or no correlation with magnetic properties. The Kršteňany section consists of two boreholes, KRS-1 and KRS-3, and comprises Late Cretaceous – Middle Eocene formations. Similarly to ZA-1, most of the KRS-3 displays paramagnetic behavior (MS <300μSI) and low NRM (<2mA/m). However, contrary to ZA-1, the distinct changes in magnetic properties at K-Pg interval were not observed. The Maastrichtian
portion of KRS-3 displays elevated, but decreasing towards K-Pg, MS values due to considerable weathering and increased hematite and/or goethite content in red-bed formation in the bottommost part of the core. Paleocene sequence through middle Ypresian shows lowest MS with higher (in pelagic sequences) and lower (in siliciclastic sequences) MS zones, probably following transgressive-regressive cycles.

The research was supported by Czech Science Foundation project no. 19-07516S and by VEGA agency no 2/0013/20, and is in accordance with research plan no. RVO67985831.