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Coupling of the benthic foraminifera *Cassidulina carinata* and hydrogen rich, isotopically heavy organic matter indicating algal blooms in the Mid Miocene Paratethys

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The studied material is from a corehole (Szokolya-2) deepened NW of the village Szokolya in the volcanic Börzsöny Mts, an active volcano at the time of deposition. Samples taken from the 0-70 m depth interval are marine marls of Badenian age, silty in the lower part and becoming more sandy towards the top. The NN5-NN6 nannozone boundary is transected at 34m (Nagymarosy 1985). The quantitative analyses of benthic foraminifera fauna revealed two distinct assemblages. In the lower part of the core most samples are dominated (sometimes exceeding 70%) by Cassidulina carinata. This species in the present day ocean is a phytodetritus feeder benefiting from recurrences of algal blooms (Fontanier et al. 2003) and known from well-ventilated areas (Hayward et al. 2002). This species seems to be adapted to fluctuating food supply. The other assemblage prevalent in the upper part of this marine sequence consists of Cibicides lobatulus, Hansawaia boueana, Asterigerinata planorbis and Elphidium spp. These species have a typical epiphytic mode of life, where Cibicidids can live on both seagrass or algal blades, while A. planorbis favours algal blades Langer (1993). Similar epiphytic assemblage (A. planorbis, C. lobatulus, Elphidiids and B. spathulata) has been described from the Upper Pliocene of Crete (Drinia et al 2005). These distinct differences of the benthic foraminiferal assemblages were expected to be reflected by amount, richness in hydrogen and carbon isotopic composition of the organic matter (OM). In the lower samples (C. carinata $>$10%) organic carbon content (TOC) ranges between 0.6 to 1.3% and relatively high values of Hydrogen Index (HI) ($>$240 mg

HC/g TOC) and ?$^{13}C_{org}$ (-20 - -22‰) indicate marine origine of the bulk of the OM. The algal blooms favouring dominance of C. carinata might have been triggered by the coeval volcanic ashes fertilizing nutrient depleted surface water of the sea. On the other hand, upper samples showing dominance of epiphytic assemblage are characterized by low values of TOC (<0.4%), HI (< 220 mg HC/g TOC) and $\delta^{13}C_{org}$ (<-24‰) compared to the upper ones. These geochemical indices all suggest a dominantly terrigenous origin of OM, in accordance with the sandy facies of the upper part. Based on these independent lines of evidence, it was concluded, that C. carinata kept its niche of profiting from fluctuating food supply since the Miocene and is suggested to be used as an ecologic marker for algal blooms through time.

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