Mid-Eocene thermals record in Istrian Paleogene basin (Outer Dinarides, Croatia), Neotethys

Renata Lukić

Department of Geology, Faculty of Science, University of Zagreb, Horvatovac 102b, 10000 Zagreb, Croatia

Stjepan Ćorić

Geological Survey of Austria, Neulinggasse 38, 1030 Vienna, Austria

Ines Galović*, Marija Horvat

Croatian Geological Survey, Sachsova 2, 10000 Zagreb, Croatia. ingalovic@hgi-cgs.hr

Katja Mužek, Đurđica Pezel, Vlasta Ćosović

Department of Geology, Faculty of Science, University of Zagreb, Horvatovac 102b, 10000 Zagreb, Croatia

Several short sections (Racani: Rac (<5 m) and two of Jakomići: J (~6 m) and Jak (~2 m)) have been studied in Istria, Northern Adriatic, micropaleontologically and geochemically. Top of *Nannotetrina* spp. (*Nannotetrina cristata*) (42.97 Ma) and base common of *Reticulofenestra umbilicus* (42.3 Ma) point to Zone NP16 (Martini, 1971) i.e. MNP16A of Lutetian (Fornaciari et al., 2010; Agnini et al., 2014), which agrees with foraminiferal E10/11 boundary zone in Racani section (Berggren and Pearson, 2005). This period is known as the late Lutetian thermal maximum (Westerhold et al., 2020). Interpreted peak climatic condition is reflected in the highest species richness (73), rapid deposition of two organic-rich intervals (7.25% TOC), that can be associated with increases in the concentration of sulphur (0.29% TOT/S) and low concentrations of Mn (0.09%), implying to low, possibly dysoxic bottom water conditions (Spofforth et al., 2010 and references therein). Warm water *Cyclicargolithus floridanus* dominates (up to 52%) in assemblage indicating meso-oligotrophic conditions (Toffanin et al., 2011).

In the Mediterranean, the base of *Furcatolithus obtusus* (39.63 Ma) coincides with the top of *Sphenolithus spiniger* (39.63 Ma), recorded at the top of the Jakomići (J) section, indicating Subzone MNP16Bc (NP17) of Bartonian that represents Chron C18n2n (Fornaciari et al., 2010). Domination of warmwater *Reticulofenestra bisecta* (21%) points to enhanced eutrophic condition that characterise CIE phase of the MECO (D'Onofrio et al., 2021 and reference therein), with still high records (71) of species richness.

The base of *Furcatolithus obtusus* at the base (first meter) of the section Jak define the base of Subzone MNP17A, which agrees with the top of *Sphenolithus spiniger* (second meter). Warm water *Reticulofenestra producta* increased (up to 25%) suggesting more shallow and mesotrophic condition (Wade & Bown, 2006) with decreased species richness (65) characteristic for post MECO phase (D'Onofrio et al., 2021).

The composition of the planktonic foraminiferal assemblages (predominantly thermocline-dwelling *Subbotina* and common sub-surface –dwelling *Turborotalia*) and the low proportion of smaller benthic foraminifera (15% in J, 3.8-5.4% in Jak, and 20% in the Rac samples) indicate eutrophic to mesotrophic conditions in the lower bathyal (Murray, 1991) and stratified water coluum (Pearson et al., 2001).

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