

# Coccolithophore ecology - insights from seasonality and biogeography on local and global scales

**Ines Galović**

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

The global regression at the end of the Badenian and tectonic events at the Badenian-Sarmatian boundary resulted in a glacio-eustatic lowstand that may have isolated the Paratethys. These events led to the development of the following endemic coccoliths: *Calcidiscus pataecus*, *Rhabdosphaera poculi*, and *Noelaerhabdus bozinovicae*. The diverse warm-water Badenian species (sphenoliths, discoasters, rhabdospheres, and umbilicospheres) were gradually replaced with species more typical of temperate areas with seasonal changes that occurred during the mid Sarmatian (*Coccolithus*, *Reticulofenestra*, and *Calcidiscus*). The Paratethys was again linked to the Mediterranean Sea in the early Sarmatian by a narrow marine connection far to the East, due to tectonic movements along the southern Anatolian fault system. A connection with the Mediterranean is confirmed by the presence of *Calcidiscus macintyreii* and *Coccolithus miopelagicus* and connection with the Indo-Pacific by the presence of *Discoaster* spp. The periodic mixing of Central Paratethys waters with the Eastern Paratethys

caused the migration of *Braarudosphaera bigelowii* and *Reticulofenestra pseudoumbilicus*. Laminated marly layers in the Vienna Basin reflect a maximum flooding surface in the Zone NN7a-NN7b transition, while a maximum transgression occurred in the mid Sarmatian Subzone NN7b in the North Croatian Basin. Increased alkalinity allowed the preservation of *Catinaster coalitus* in the late Sarmatian. In most parts of the North Croatian Basin, as in the entire Paratethys, the drastic decrease in the number of species and genera, with monospecific and endemic development, characterized a shallower and more restricted stratified environment with large salinity fluctuations during the Sarmatian-Pannonian transition. These events were caused by regional tectonic movements at the end of Sarmatian. In deeper marine parts with periodic marine communication during the warmer season, the short appearance of *Nickolithus amplificus*, *Amaurolithus tricorniculatus*, and *Ceratolithus armatus* marked the final Paratethys-Tethys closure at the beginning of the Pannonian.