

species occur in two different Paratethyan basins in roughly coeval environments and only a single Middle Miocene species is also known from the adjacent Mediterranean Sea. This pattern points to an extremely poor documentation of this group in the post-Eocene deposits of central and southern Europe. Thus, the diversities during the Oligocene and Miocene remain low and range from one to four species. A slight increase during the Langhian might be correlated with the Mid-Miocene Climate Optimum but could also be simply related to the larger extent of Middle Miocene deposits.

Stalked barnacles are highly informative in terms of palaeobathymetry, often indicating bathyal or at least deep sublittoral environments. Therefore, they are important index fossils for palaeobathymetric and palaeogeographic reconstructions in the Paratethys. Especially, the abundance of the lepadiform *Poecilasma* in evaporitic deposits of the Middle Miocene Badenian Salinity Crises may serve as new evidence for a deeper marine depositional environment. As extant *Poecilasma* are deep water dwellers, these occurrences are important proxies for deep marine basins in the Carpathian Foredeep during the Middle Miocene.

Palaeocene/Eocene and Lower Eocene monoaperturate pollen from Austria

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Pollen from two localities in Austria will be re-evaluated and illustrated: 1) New samples from the Lower Eocene Krappfeld locality (Carinthia) is characterized by a diverse terrestrial microflora that reflects real megathermal conditions (HOFMANN & ZETTER 2001, ZETTER & HOFMANN 2001) and 2) the Palaeocene/Eocene boundary locality (Salzburg County), in which the terrestrial microflora is less diverse and comprises more mesothermal elements, such as various *Normapolles* taxa. The difference between more mesothermal climatic conditions during the Palaeocene/Eocene transition and more megathermal climatic conditions during the lower Eocene can be particularly well established by the presence or absence and diversity of sulcate and monoporate pollen types occurring in both localities. At Krappfeld there is a dominance of mainly Arecaceae (e.g., various Calamoid types and *Nypa*), and to a lesser extent Araceae (*Proxapertites* type) and Chloranthaceae (*Emmapollis*) in contrast to abundant *Sparganium* and Restoniaceae, only two Arecaceae and one Araceae (*Lysichiton*-type) in the Salzburg area.

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Reconstructing the formation of microbialites in post-glacial coral reefs using lipid biomarkers and stable isotopes

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At Tahiti (Central Pacific), the post-Last Glacial Maximum (LGM) reef-succession typically consists of coral framework encrusted by coralline algae and later by thick (up to 15 cm) microbial carbonate crusts, so called reef-microbialites. These microbialites make up as much as 80 % of the rock volume (CAMOIN et al. 1999). Similar deglacial microbialites occur in coral reefs off Vanuatu (South-West Pacific; CABIOCH et al. 1999), whereas only thin crusts of microbial carbonates were observed in Holocene coral reefs off Belize (Caribbean) and from the Maldives (Indian Ocean; GISCHLER 2008, GISCHLER et al. 2008). After sea-level stabilized approximately 6000 years ago, microbialites ceased to form in these coral reefs. Their occurrence in post-LGM reefs is believed to reflect environmental change during the rapid last deglacial sea-level rise (CABIOCH et al. 1999, CAMOIN et al. 1999).

To improve our understanding of the genesis of reef-microbialites, we used lipid biomarkers extracted from the microbial carbonate and the stable isotopic compositions of sulfur and oxygen in carbonate-bound sulfate as well as the stable isotopic compositions of sulfur in sulfide minerals to identify microbes and processes inducing microbialite formation during the last sea-level rise. Detected sterols, saturated and monounsaturated short-chain fatty acids are predominantly derived from both marine primary producers (algae) and bacteria, whereas long-chain fatty acids and long-chain alcohols derived mainly from higher land plants representing terrestrial input. Bacterially-derived branched fatty acids (10-Me-C_{16:0}, *iso*- and *anteiso*-C_{15:0} and -C_{17:0}) and mono-*O*-alkyl glycerol ethers (MAGEs) are biomarkers of intermediate to high specificity for sulfate-reducing bacteria (SRB). These branched fatty acids as well as MAGEs are exceptionally abundant in the microbial carbonates from Tahiti (HEINDEL et al. accepted) and Vanuatu compared to the deglacial inter-reef sediment from Tahiti. In microbial crusts from Belize and the Maldives, the biomarker signal of SRB is weak. The isotopic values of the carbonate-bound sulfate in microbialites from Tahiti and Vanuatu ($\delta^{34}\text{S}$: 21.9 to 22.2‰, $\delta^{18}\text{O}$: 11.3 to 12.4‰) are higher than that of a coral ($\delta^{34}\text{S}$: 21.3‰, $\delta^{18}\text{O}$: 10.5‰), recovered from the same post-glacial reef-interval off Tahiti, and modern seawater ($\delta^{34}\text{S}$: 20.3‰, $\delta^{18}\text{O}$: 8.6‰), which indicates bacterial sulfate reduction. The sulfide minerals (mainly pyrite) in microbialites from Tahiti and Vanuatu yield low $\delta^{34}\text{S}$ values from -43.2 to -