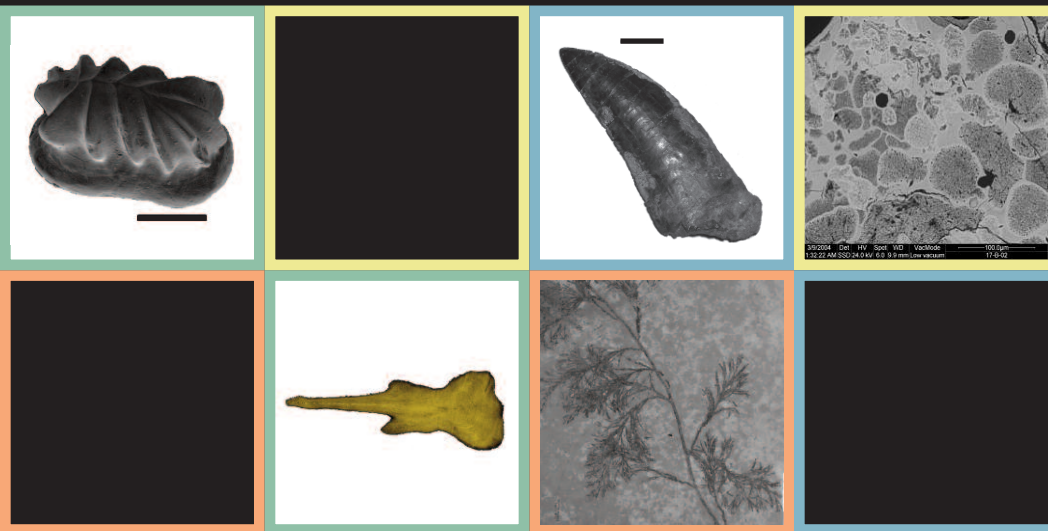


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New perspectives on the Evolution of Phanerozoic Biotas and Ecosystems



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Mesowear of Late Miocene large herbivorous mammals from the Pikermian fauna of Greece and Iran: dietary and ecological implications

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Late Miocene (11.6–5.3 million years ago) was a period of global climatic cooling and aridification. Consequently, land mammals had started to adapt to the increasingly open and grass-dominated biomes. The Eurasian Pikermian fauna is a well-known example of this evolutionary trend, including many species adapted to the new environment known as the Pikermian Biome in the Eurasian midlatitudes (e.g. Solounias *et al.*, 2010). It has been considered a past analogue of modern East African Savanna, though with a clearly different vegetation spectrum.

Fossil molars of large mammalian herbivores from three classic localities of the Pikermian Biome—Pikermi (17 specimens) and Samos (13), Greece, and Maragheh (46), Iran—were analysed with the mesowear method introduced by Fortelius and Solounias (2000). Mesowear is the gross macroscopic wear of mammalian herbivore molars, determined by the animal's average long-term diet (browsing i.e. leaf-eating and/or grazing i.e. grass-eating). Obtained mesowear scores were used in a cluster analysis where the fossil taxa were clustered with modern taxa belonging to well-known dietary categories.

Among individual taxa, the Maraghean rhinoceros *Chilotherium persiae* (n=12) gave a surprising browsing signal despite its hypsodonty (i.e. high-crowned molars), a feature that is often but not always related to a specialized grazing diet. *Gazella* from Pikermi (n=3) and Samos (n=4) clustered with

browsers to browse-dominated mixed feeders, while the sample from Maragheh (n=4) indicated a more grass-dominated mixed diet. The antelope *Tragoportax* from Pikermi and Samos yielded results that indicate the Pikermian *T. amalthea* (n=7) used more grass in its diet than the Samian *T. amalthea* and *T. rugosifrons* (n=4 together), even though Pikermi is regarded to have been more closed of the two localities. The abundant hipparionine horses (n=33), typical of the Pikermian fauna and classically seen as indicators of open savanna-like biomes, showed a wide range of diets, but none of the three hipparion populations included zebra-like grazers.

As a whole, the results confirm those of previous studies, depicting a fauna consisting of browsers and mixed feeders with a notable lack of specialised grazers. This suggests that the Pikermian Biome was a varied woodland with grassy openings.

References

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