The incidence of unusual test morphologies of Eocene Larger benthic foraminifera: An example of Paleogene Adriatic Carbonate Platform

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The Paleogene Adriatic carbonate platform(s) existed within the Central NeoTethys (around 32 N paleolatitude) from the Danian to the late Eocene (Bartonian/Priabonian) and produced a succession of limestones up to 500 m thick, rich in larger benthic foraminifera (LBF). The Eocene sediments are widely distributed along the eastern Adriatic coast and have been studied for many years. Taking into account the climatic changes that took place within the Eocene (Early Eocene and Middle Eocene climatic optima, known as EECO, MECO), special attention was paid to the composition of shallow-marine foraminiferal assemblages. The studies reveal the following trends: (1) the alveolinid-dominated assemblages were replaced by nummulitid-dominated assemblages around the MECO; (2) the greater species and morphological diversity (spherical, ellipsoid, extremely elongated fusiform) of the alveolinid fauna was evident at the EECO; (3) the nummulitid-dominated fauna was characterized by less diversified assemblages compared to the alveolinid ones and by the co-occurrence of scleractinian corals, coralline red algae and aborescent foraminifera. The occurrence of twin embryos has been assigned to the early Eocene in the alveolinid populations, especially in Alveolina levantina and A. axiampla (in some sections, the frequency is greater than 5%), and these coalesced embryos have the same size as the single form (usually they are smaller). The LBF assemblages of Middle Eocene showed a greater frequency of doubled adult tests (Orbitolites sp., Nummulites sp.). The origin of these unusual morphologies is poorly known, usually described as the results of stressful conditions. Considering the timing of the appearance of such morphologies, temperature and associated changes in the shallow-marine environment could be the cause.

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