



Macroevolutionary emergence of bathymetric gradients in molluscan metacommunity turnover (NE Atlantic)

Adam Tomasovych (1), Stefano Dominici (2), Martin Zuschin (3), and Didier Merle (4)

(1) Geological Institute, Slovak Academy of Sciences, Dúbravská cesta 9, 84005 Bratislava, Slovakia, (2) Sezione di Geologia e Paleontologia, Museo di Storia Naturale, Università di Firenze, Via La Pira 4, 50121 Firenze, Italy, (3) University of Vienna, Department of Palaeontology, Althanstrasse 14, 1090 Vienna, Austria, (4) Département Histoire de la Terre, UMR CNRS 7207, CR2P, CP 38, Muséum National d'Histoire Naturelle, 8, rue Buffon, 75005 Paris, France

Although marine invertebrate lineages turn over at a higher rate in onshore than in offshore environments at macroevolutionary time scales, it remains unclear whether this pattern scales down to shorter time scales and whether it is linked to different sensitivity of onshore and offshore environments to climatic changes. We show that while turnover of molluscan metacommunities significantly declines with increasing depth between the tropical Eocene habitats and warm-temperate Pliocene habitats (>10 Myr) in the NE Atlantic Province, it does not change with depth at shorter time scales - within Eocene and Pliocene (<1 Myr). This offshore decline in long-term turnover is caused by a higher onshore extinction of genera and families and by an onshore expansion of genera and families that were frequent in offshore in the Eocene. Even when higher temporal climatic variation in shallower environments is counteracted by evolution favoring generalists at shorter scales, lineages inhabiting shallower environments should be less buffered against long-term regional-scale climatic fluctuations that exceed the range of short-term climatic variability. We hypothesize that bathymetric differences in macroevolutionary turnover emerge only when assessed over temporal scales exceeding several Myr.