EGU23-17215, updated on 01 Feb 2024
https://doi.org/10.5194/egusphere-egu23-17215
EGU General Assembly 2023

Mediterranean biodiversity gradient initiated by basin restriction

Konstantina Agiadi[1], Niklas Hohmann[2], Elsa Gliozzi[3], Danae Thivaiou[4], Alberto Collareta[5], Francesca Bosellini[6], Giovanni Bianucci[5], Laurent Londeix[7], Francesca Bulian[8], Francesca Lozar[9], Alan Maria Mancini[9], Stefano Dominici[10], Pierre Moissette[4], Ildefonso Bajo Campos[11], Enrico Borghi[12], George Kontakiotis[4], Stergios Zarkogiannis[13], Mathias Harzhauser[14], Angelo Camerlenghi[15], and Daniel Garcia-Castellanos[16]

[1]University of Vienna
[2]Utrecht University
[3]Università Roma 3
[4]National and Kapodistrian University of Athens
[5]Università di Pisa
[6]Università degli Studi di Modena e Reggio Emilia
[7]Université de Bordeaux
[8]University of Groningen
[9]University of Torino
[10]Universita degli Studi Firenze
[11]Museo de Alcalá de Guadaíra
[12]Società Reggiana di Scienza Naturali
[13]University of Oxford
[14]Vienna Natural History Museum
[15]OGS Istituto Nazionale di Oceanografia e di Geofisica Sperimentale
[16]Geosciences Barcelona, CSIC

Physical connectivity between marine basins facilitates population exchange and hence controls biodiversity. The Mediterranean Sea is a semi-restricted basin with only a small two-way connection to the global ocean, and it is a region heavily impacted by climate change and biological invasions today. The massive migration of non-indigenous species into the basin through the Suez Canal, driven and enabled by climate warming, is drastically changing Mediterranean biodiversity. Understanding therefore the origin and cause(s) of pre-existing biodiversity patterns is crucial for predicting future impacts of climate change. Mediterranean biodiversity exhibits a west-to-east decreasing gradient in terms of species richness, but the processes that resulted in this gradient have only been hypothesized. By examining the fossil record, we provide evidence that this gradient developed 5.33 million years ago at the end of the Messinian Salinity Crisis, and it was therefore caused by the re-population of the basin by marine species with a dominating western source at the Mediterranean–Atlantic gateway.