



New insights on “elevated epifauna” as proxies for Mediterranean Outflow Water (MOW) reconstruction in the Gulf of Cadiz

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The term “elevated epifauna” has been established for those benthic foraminifera adapted to inhabit elevated substrates (hard rocks, shells...) above the sediment surface to optimize food acquisition under the influence of strong bottom currents. In the Gulf of Cadiz, increased abundances of these taxa have been directly related to the presence of Mediterranean Outflow Water (MOW), providing a potentially powerful proxy for water mass reconstruction in the past. Quantitative analyses of Late Miocene to Early Pliocene benthic foraminifera from IODP Hole U1387C (IODP Expedition 339) was performed to reconstruct the onset of MOW. Multi-proxy records, including the elevated epifauna (represented by *Planulina ariminensis*, *Cibicides lobatulus* and *C. refulgens*) indicate the influence of Mediterranean waters only a few 100 kyrs after the opening of the Gibraltar Strait. However, our records show a clear correlation of peak abundances of *C. lobatulus* and *C. refulgens* with allochthonous shelf taxa and grain-size maxima, suggesting downslope transport to deeper settings. To clarify this issue, stable isotope analyses ($\delta^{18}\text{O}$, $\delta^{13}\text{C}$) have been performed on shells of shelf dwellers (*Elphidium* spp., *Asterigerinata* spp., *Ammonia* spp.), deep water epifauna (*Cibicidoides pachyderma*), infauna (*Uvigerina peregrina*), and elevated epifauna (*C. lobatulus*, *P. ariminensis*, *C. refulgens*) from the Pliocene sediments. Preliminary results show that *C. lobatulus* and *C. refulgens* are isotopically similar to the shelf dwellers. In contrast, shells of *P. ariminensis* show a signature close to the epifaunal *C. pachyderma*, suggesting their formation in deeper waters.

Our results suggest that in areas with unstable continental margins such as the Gulf of Cadiz the elevated epifauna is likely to be biased by downslope transport of taxa with a broad bathymetric range such as *C. lobatulus* and *C. refulgens*. Abundances of these taxa should be treated with caution when co-occurring with allochthonous shelf taxa. Other elements of the elevated epifauna such as *P. ariminensis* are restricted to slope environments and provide a more reliable indicator of bottom-current strength. In a next step, we will include foraminiferal shells of core-top samples in our analyses which will ultimately contribute to an improved understanding of the elevated epifauna as an indicator of MOW in the Gulf of Cadiz and bottom current strength in general.