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# Role of the Alboran Sea volcanic arc choking the Mediterranean to the Messinian salinity crisis and foundering biota diversification in North Africa and Southeast Iberia

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The Mediterranean Sea desiccated ∼5.96 million years ago when it became isolated from the world oceans during the Messinian salinity crisis. This event permitted the exchange of terrestrial biota between Africa and Iberia contributing to the present rich biodiversity of the Mediterranean region. The cause chocking the Mediterranean has been proposed to be tectonic uplift and dynamic topography but the driving mechanism still remains debated. We present a new wide-angle seismic profile that provides a detailed image of the thickness and seismic velocity distribution of the crust in the eastern Alboran basin. The velocity model shows a characteristic structure of a subduction-related volcanic arc with a high-velocity lower crust and a 16-18 km total-thickness igneous crust that magmatic accreted mostly between ∼10-6 Ma across the eastern Alboran basin. Estimation of the isostatically corrected depth of the arc crust taking into account the original thermal structure and sediment-loading subsidence since 6 Ma places a large area of the eastern Alboran basin above sea level at the time. This estimation is supported by geophysical data showing subaereal erosional unconformities for that time. This model may explain several up-to-now-disputed features of the Messinian salinity crisis, including: the progressive isolation of the Mediterranean since 7.1 Ma with the disappearance of open marine taxa, the existence of evaporites mostly to the east of the volcanic arc, the evidence that the Gibraltar straits were not a land bridge offered by continuous Messinian open marine sediments at ODP site 976 in the western Alboran basin, the importance of southeastern Iberia and North Africa as centres of biota diversification since before the salinity crisis, and patterns of speciation irradiating from SE Iberia and the eastern Rif in some taxons.