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Quaternary evolution and paleoclimatology of the coastal cave of Selinitza (SW Peloponnese, Greece) based on geomorphological and geochemical data

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The present study examines the Quaternary evolution of the Selinitza coastal cave in SW Peloponnese, in an attempt to provide new insights on the paleogeographical and paleoclimatological conditions of the Eastern Mediterranean Sea. The entrance of Selinitza Cave is located +18 m above present sea level (a.p.s.l.) on the eastern coast of Messiniakos Gulf (SW Peloponnese), an area of constant uplift since Middle Pleistocene. Considering the phreatic origin of Selinitza and the presence of sea level indicators at its entrance (biological and geomorphological markers such as tidal notches and *Lithophaga* borings), all together qualify the cave suitable for the study of former sea level changes and more particularly, those during the last interglacial period. The MIS 5e is considered the most suitable geological period for the estimation of future sea level rise due to the plethora of geological data at-or-near the coastal zone combined to sea-level fluctuation circles from Middle Pleistocene to-date. Previous results from Selinitza Cave place the sea level of the latest phase of the last interglacial at +18 m a.p.s.l.

The Eastern Mediterranean is the least studied area relative to the Western Mediterranean, regarding sea level changes during Marine Isotope Stage 5e (MIS 5e). In order to reconstruct the paleogeography of the area and shed light on the climatic conditions of this period, our study involved geological mapping, field measurements and identification of geomorphological features (marine terraces, coastal caves and former sedimentary tidal environments). Additionally, 3D mapping of Selinitza was conducted in order to precisely define its relative location in respect to the present sea level. Moreover, X-ray diffraction, optical microscopy, mineralogy and major and trace element geochemistry of speleothems and clastic sediments found in the inner part of Selinitza were also employed and combined to the aforementioned geomorphological data.

The objective of the study is to provide a model for the development and the paleoclimatic conditions of the Selinitza Cave during Late Pleistocene, how sea-level affected the aforementioned system, and finally provide an estimate of sea-level fluctuation over the last 125 ka.