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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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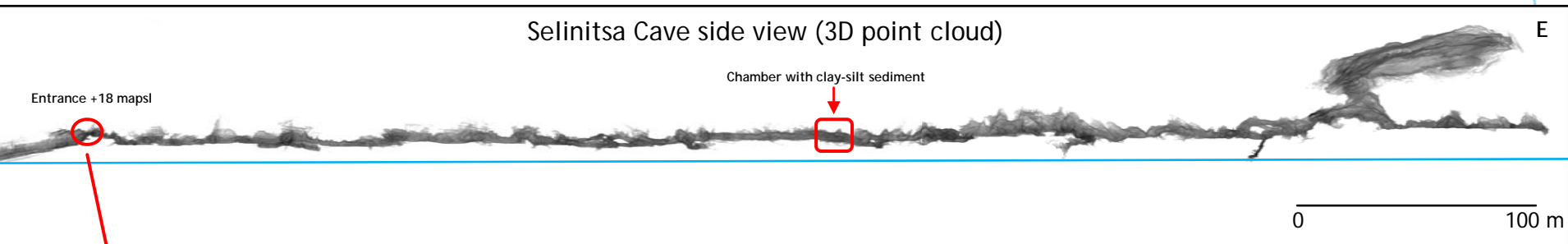
Studied area





Selinitsa Cave

Selinitsa Cave side view (3D point cloud)



Tidal notch



Lithophaga boreholes

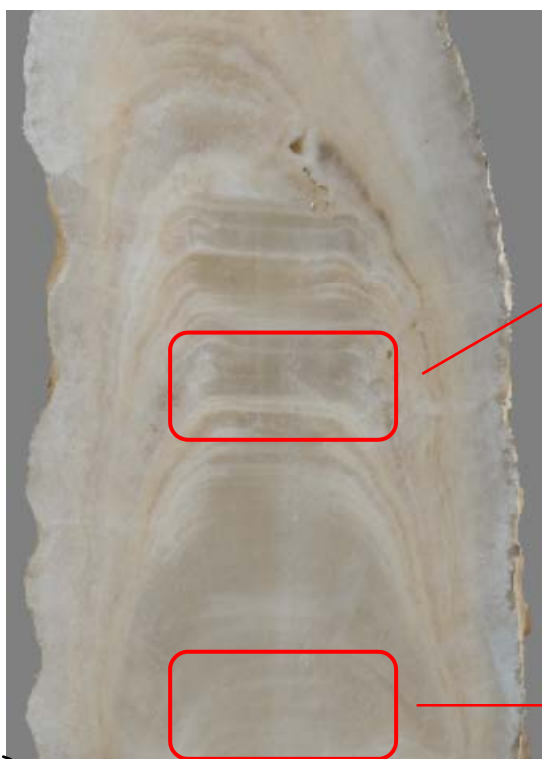




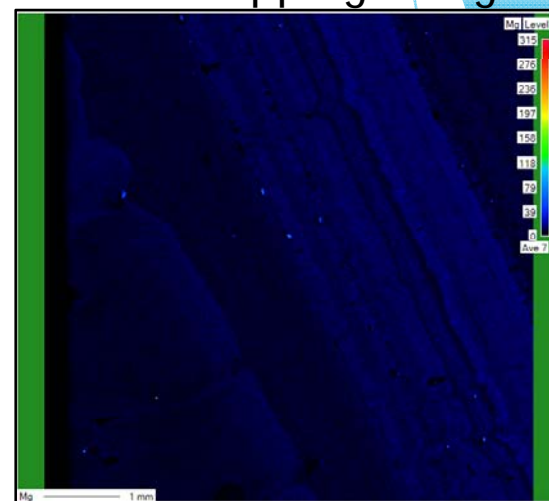
Selinita Stalagmite



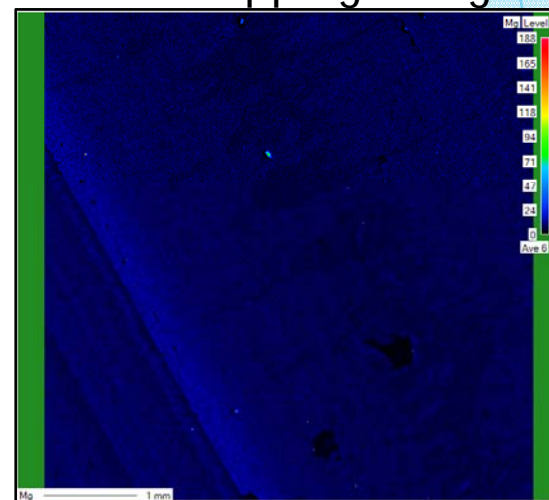
Thin section areas



EPMA Mapping of Mg

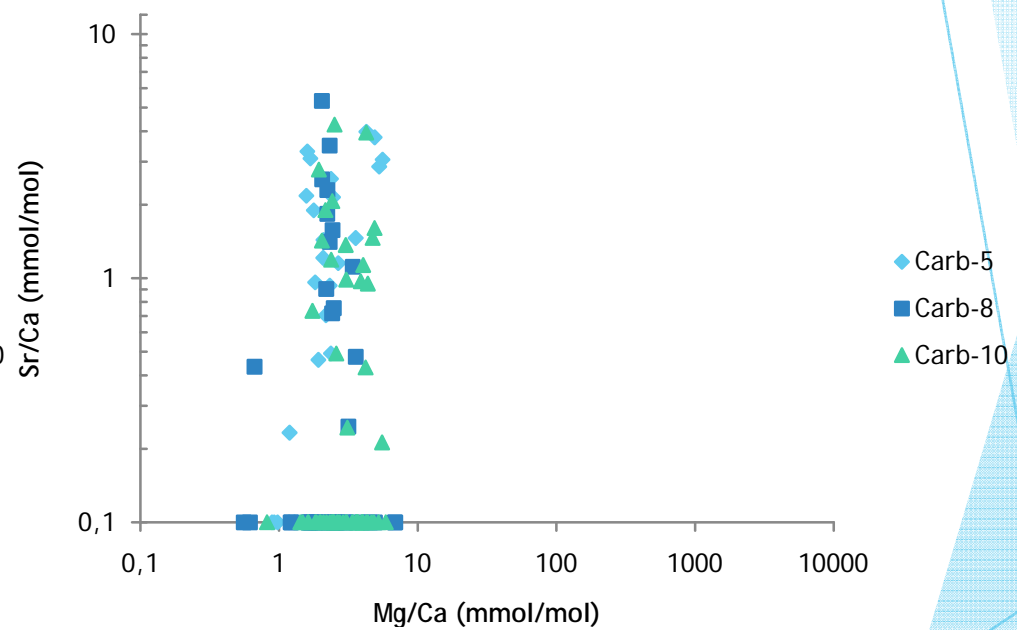
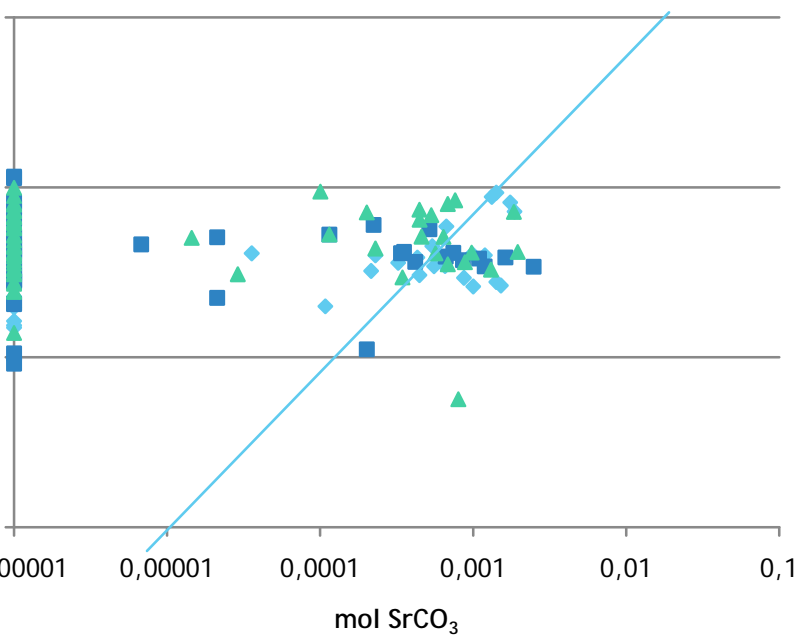


EPMA Mapping of Mg



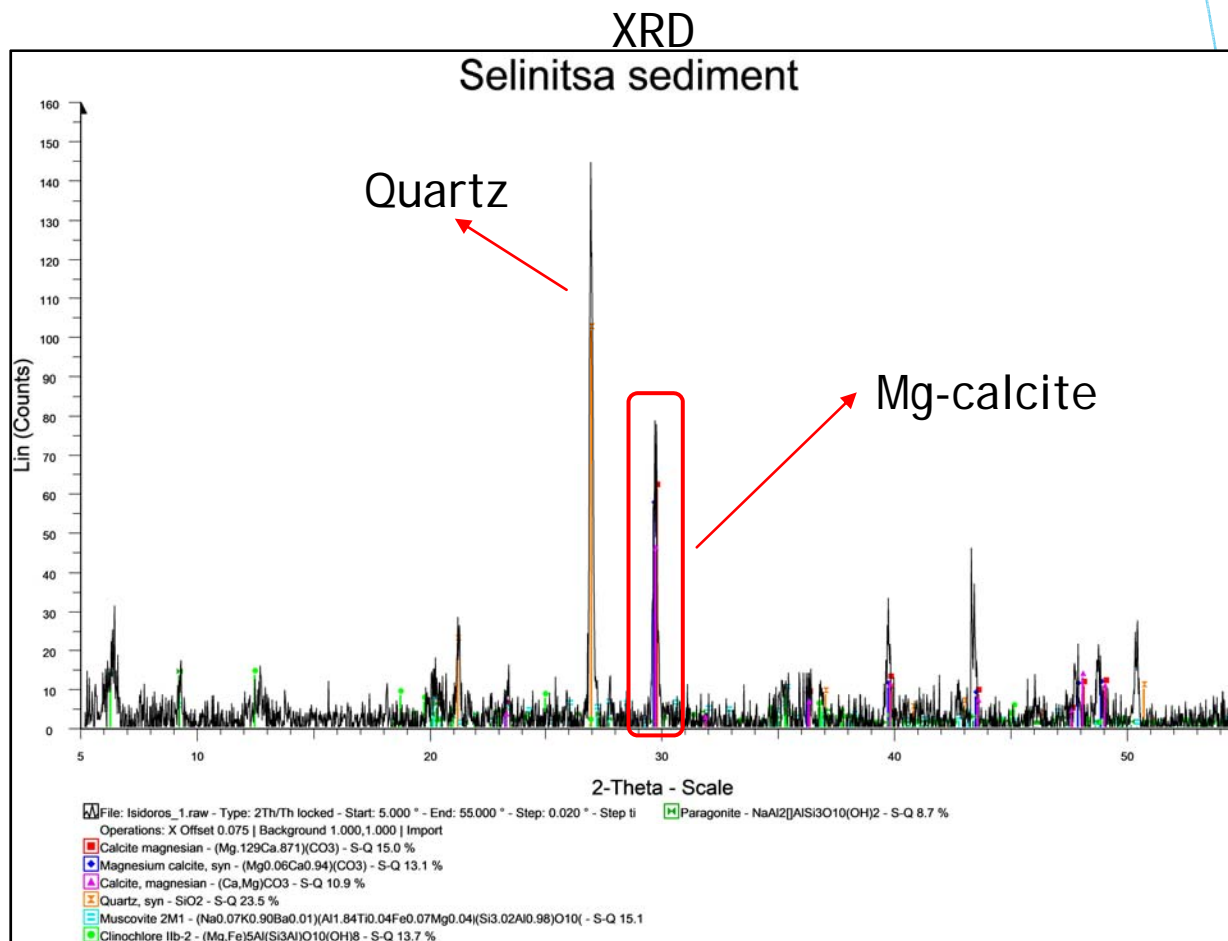


Selinita Stalagmite





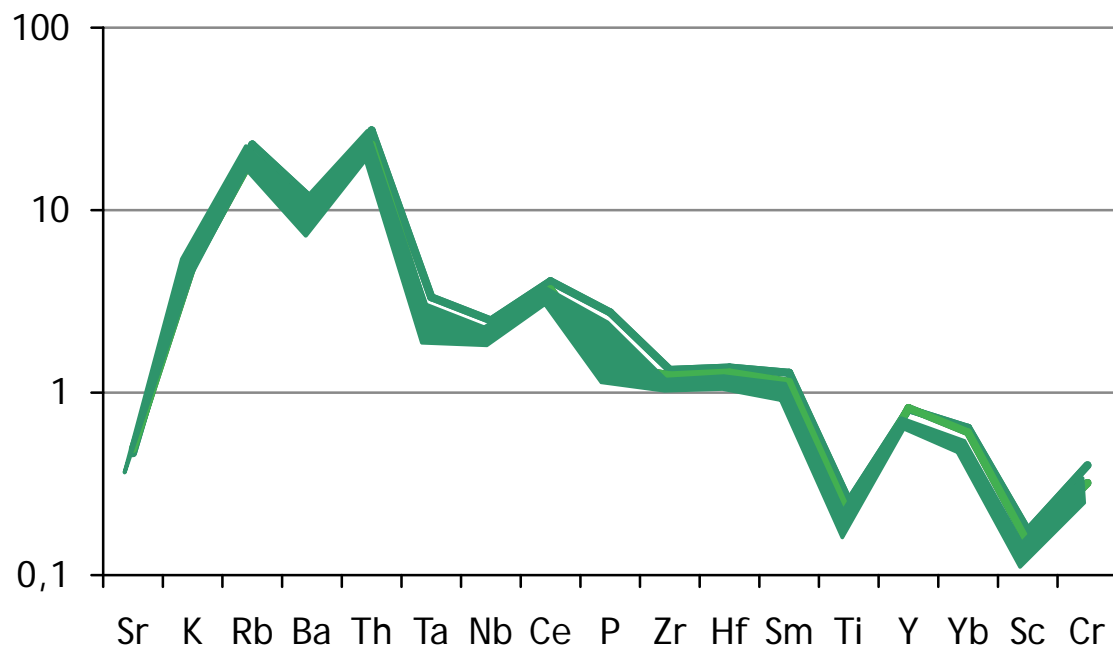
Selinitsa Cave Fine sediment



The clay to clay-silt sediment is predominated by detrital quartz and authigenic Low Mg-calcite (LMC). Its stratigraphic architecture suggests marine influence and supports inundation of the chamber by the sea.



Selinitza Cave Fine sediment



MORB normalized spider diagram of the Selinitza sediments following Pearce (1983) - green area. The diagram's pattern is representative of active continental margins.



Conclusions



The Selinitza Cave was once flooded by the sea but due to the constant tectonic uplift, today is located in the unsaturated zone.

The presence of geo- bio- relative sea level indicators reveals the influence of the cave by the sea.

Previous studies (under submission) place the sea level during the late phase of the Last Interglacial (LIG) at 18 m above present sea level (apsl).

The fine-grained sediment at the inner part of the cave supports marine inundation conditions.

The mineralogy and petrography of the stalagmite is characterized mainly by Low Mg-calcite (LMG). The EPMA mapping revealed well-developed Mg zoning suggesting the presence of Mg in the depositional environment.

The Mg content presents a relative stable concentration, whereas the Sr bears a larger dispersion. The Sr values may suggest diagenesis of primary aragonite to secondary calcite, and the small range in Mg content of speleothem calcite may indicate a stable and continuous source of Mg in the Selinitza system (probably contribution by the flysch above the cave).

The sea level of the LIG at 18 mapsl, the max altitude (~18.87 mapsl) of the sediment and the presence of authigenic Mg-calcite in it point to warm climatic conditions and flooding of the cave by the sea.

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