

Pleistocene tectonics in western Sardinia (Italy): insights from the Sinis peninsula

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The Sardinia block is a fragment of the European lithosphere located in the center of the western Mediterranean Sea between the Balearic and Tyrrenian basins, opened in the Lower-Middle Miocene and Upper Miocene-Pleistocene respectively. It is generally believed tectonically stable during the last million years, and for this reason it is considered as a touchstone to evaluate sea-level variation during Quaternary. The Sinis peninsula (in central-western Sardinia) is a structural high located on the western shoulder of the Campidano graben that account for the most recent tectonics developed in the Island, and there crops out one of the most studied Quaternary sedimentary succession of the Island, with a detailed chronological framework.

New structural-geological studies reveals the presence of some normal faults N-S striking and steeply dipping eastwards, never reported before, that deformed the late Quaternary succession, maybe up to the end of the Upper Pleistocene. In outcrops close to San Giovanni village and Capo San Marco is possible to detect displacement, up to some tens of meters, of the stratigraphic markers inside the Plio-Pleistocene succession, with a damage zone wide 5-10 meters and the occurrence of deformation bands developed in the poorly consolidated bioclastic-rich sandstones. By considering the age of the displaced formations, the offset of stratigraphic markers, the paleoshoreline present day elevation and the paleo-sea level position is possible to reconstruct the tectono-stratigraphic evolution of the area, characterized by an up and down kinematics. These findings show that the Sinis structural high cannot be anymore assumed as a stable or slight subsiding area and accordingly some doubts arise about the late Quaternary tectonic stability of the Sardinia crustal block.