
Investigations on shoreline displacement and geoenvironmental changes in Ionian coastal plains of Greece (SW Peloponnese) over the Last Interglacial-Glacial Cycle, by means of Optically Stimulated Luminescence geochronology.

ATHANASSAS, K. FOUNTOULIS, I.

National and Kapodistrian University of Athens, Faculty of Geology and Geoenvironment, Department of Dynamic Tectonic Applied Geology

This paper employs Optically Stimulated Luminescence (OSL) dating on sediments associated with Late Quaternary geologic changes in coastal plains of the Ionian Sea, in the southwestern Peloponnese, Greece, aiming at reconstructing the regional chronology and paleogeography over the Last Interglacial-Glacial (~120 ky) Cycle. Specifically, sea level underwent global fluctuations throughout the Later Pleistocene, due to the succession of decay and build-up of the northern hemisphere ice sheets. This has been well documented in the marine isotopic record (Oxygen Isotope Stages). Of equal importance are vertical crustal movements which might have been involved in the configuration of the Ionian shoreline (Kelletat et al., 1978). Fortunately, a well-preserved sedimentary record of eustasy throughout the Quaternary exists along the southern Ionian coastal plains (Marcopoulou-Diacantoni et al., 1991; Fountoulis and Moraiti, 1994; Kourampas and Roberston, 2000).

In addition, the southwestern shore of the Peloponnese exhibit evidence of hominid exploitation from the Middle Paleolithic period onward (Davis et al., 1997). Human activity is controlled by the coastal processes and thus its remains may comprise important indicators of coastal displacement. In particular, archaeological surveys have located Middle Paleolithic sites on preserved paleosols, incorporated into Late Pleistocene fossilised dune and beach deposits that stretch along the modern shoreline. Furthermore, archaeological sites related to posterior times, a few as recent as Hellenistic and Roman, are currently sunken several meters below modern sea level and hence, they can be turned to advantage as markers of neotectonic subsidence.

Optically Stimulated Luminescence (OSL) dating directly dates the time of sediment deposition. The major advantage of OSL is that the optical signal from quartz mineral grains consists a natural 'chronometer' which can be reset by direct exposure to sun light (Murray and Olley, 2000). Using up-to-date OSL methods, we attempt to chronologically connect climatic stadials/interstadials of the Later Pleistocene, as derived from already published oceanic isotopic curves, with regional coastal configurations as well as with local traces of hominid activity. The combined practice of these approaches, have permitted us to ascertain raise of the Ionian continental shelf during specific low-stands, and therefore, the westward extension of the present coastal plains at individual Oxygen Isotope Stages of the Last Interglacial-Glacial Cycle.

References

- Davies, J.L., Alcock, S.E., Bennet, J., Lolos, Y.G., Shelmerdine, C.W. 1997. The Pylos regional archaeological project part I: overview and the archaeological survey. *Hesperia*, 66, 391-494.
- Fountoulis, I., Moraiti, E., 1994. Sedimentation, paleogeography, and neotectonic interpretation of post-

- alpine deposits in the Kyparissia-Kalo Nero Basin. *Bull. Geol. Soc. Greece*, 30, 323–336.
- Kellett, D., Kowalczyk, G., Schröder, B., Winter, K-P. 1976. A synoptic view on the neotectonic development of the Peloponnesian coastal regions. *Z. dt. Geol. Ges.*, 127, 447-465.
- Kourampas, N., Robertson, A.H.F., 2000. Controls on Plio-Quaternary sedimentation within an active fore-arc region: Messinia Peninsula (SW Peloponnese), S. Greece. In: Panayides, I., Xenophontos, C., Malpas, J. (Eds.), 2000, Proceedings of the Third International Conference on the Geology of the Eastern Mediterranean, pp. 255–285.
- Marcopoulou-Diacantoni, A., Mirkou, M.R., Mariolakos, I., Fountoulis, I., 1991. Stratigraphic and paleoecological observations on the post-alpine sediments at the area of Filiatra (Messinia, Peloponnesus) and their neotectonic explanation. *Bull. Geol. Soc. Greece*, 25, 593–688.
- Murray, A.S., Olley, J.M., 2002. Precision and accuracy in the optically stimulated luminescence dating of sedimentary quartz: a status review. *Geochronometria*, 21, 1–16.