Geophysical Research Abstracts
Vol. 17, EGU2015-9275, 2015
EGU General Assembly 2015

Stratigraphic Paleobiology of the Taranto Area

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The area surrounding Taranto, Italy is chronostratigraphically very important, as it is one of the few areas in the world where Upper Pleistocene marine successions are well exposed, easily accessible, and relatively thick. Several outcrops in this area were investigated as suitable marine sections for defining the Late Pleistocene GSSP. At these locations, the late Pleistocene bathymetric history of the Taranto area was depicted using macrobenthic assemblages from a network of outcrops and cores. Outcrops at Pontile, Fronte, and Garitta, along with two cores drilled at Cimino and Cantoro were densely sampled to conduct quantitatively-derived paleobathymetric reconstructions. These deposits yielded relatively diverse mollusk associations (> 250 species and > 9.000 specimens distributed among 55 samples), dominated by extant mollusk species of known bathymetric distribution. Multiple analytical approaches were applied to the macrobenthic dataset in a comparative fashion: (i) direct calibration by weighted averaging of taxa with known preferred depth recovered in a sample, (ii) posteriori-calibrated ordination (DCA) using bathymetric data of key extant taxa. These analyses were conducted at both species and genus level. Regardless of the choice of the analytical method, mollusk assemblages yielded bathymetric trends congruent with previous qualitative and semi-quantitative paleoecological and stratigraphic analyses: the bathymetric range of sampled deposits is bracketed between 140 and 0 meters. Secondly, macrobenthos-derived proxies provided an improved characterization of the marine deposits in terms of sample bathymetry and by discriminating shallowing-upward (regressive) trends from deepening-upward (transgressive) tendencies. Thirdly, mollusk-derived bathymetric inferences suggest spatial bathymetric gradients that are coherent with the morphology of the study area. In conclusion, the results provided an improved characterization of coastal depositional facies in a sequence stratigraphic perspective, which is one of the primary research goals of Stratigraphic Paleobiology.