



Reconstruction of palaeoenvironmental changes and their impact on Bronze-Age cultures: results from a geoarchaeological research project in the Ida-Mountains, Central Crete

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Palaeoenvironmental investigations in the Mediterranean based on marine, limnic or fluvial sediments provide important information about ancient landscapes and their evolution. In case of remote and mountainous study areas, predominantly in karst regions without surface waters, such reconstructions are hampered by a lack of corresponding geoarchives. In this connection, terrestrial proxy data sources like colluvial fillings of dolines can yield promising records for Holocene environmental history. Nevertheless, these karst archives have barely been investigated so far due to a common uncertainty about the thickness of the sedimentary fillings and a vague suitability for palaeoclimatic research. Our studies focus on the contemporary uninhabited Ida Mountains in Central Crete, which were obviously populated and fit for agricultural use during the second millennium B.C. The main question is how and why Bronze-Age people were able to occupy this area, particularly with regard to the impressive Minoan settlement complex of Zominthos at 1200 m a.s.l. Geophysical prospection (refraction seismics, geoelectrical resistivity tomography) was carried out in several dolines. The results show that karst depressions are sometimes filled up more than 15 m by colluvial materials or residual clays and offer valuable information about the environmental history. Selective percussion drilling within the sinkholes provided sediment cores, which were investigated physically (grain size, magnetic susceptibility, heavy minerals, X-ray diffraction), chemically (phosphorous, iron content, CNS-

analysis), as well as by datings (OSL, Radiocarbon) and thus reveal stratigraphical data on a maximum depth of 10 m. Preliminary analyses show a diversified sediment constitution that indicates several geomorphodynamic oscillations. XRD-spectra of clay minerals moreover exhibit a significant aeolian dust contribution to soil formation and sediments, while the heavy mineral composition seems to be very heterogeneous with probable volcanogenic deposits of external origin. Geoelectric tomographies and sediment cores taken nearby the ancient settlement allow the differentiation between environmental processes and past human activities. The investigations also prove the so far unknown but outstanding size of subsurface archaeological remains, which suggest that all year settlement in Mid Holocene might have been possible due to better climatic conditions.