



Anthropogenic Overprints on Natural Coastal Aeolian Sediments, a Case Study from the Periphery of Ancient Caesarea, Israel

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Since the rise to dominance of humans, mainly following the agricultural revolution, the earth's soils and sediments have been affected by anthropogenic activities. In the current study the effect of human settlement on their proximate environment is explored, outside the settlement of ancient Caesarea, a well-known Roman to Early Islam period urban centre in the central coastal plain of Israel. This investigation is conducted by analysis of human induced macroscopic artefacts as well as microscopic remains found in buried sediments. These anthropogenic markers are retrieved through boreholes and assessed by sedimentological analyses coupled with radiometric dating techniques, microarchaeology and integrated with archaeological and historical records. Two units were identified in the study area south of ancient Caesarea based on their petro-sedimentological properties. The lowermost unit is a red-brown loam locally known as hamra, while the uppermost covering unit is inferred as loose sand. The sand unit, reaching thicknesses of up to 9 metres, is chronologically constrained between 6 ka to present consisting of four facies. Out of these four facies the uppermost and lowermost lithologies were interpreted as natural beach and aeolian deposits that are interbedded with two grey coloured, artefact-containing, anthropogenic sand facies. One anthropogenic facies represents an urban garbage mound and the other is an agricultural pedo-sediment, both dated to the Roman-Early Islamic periods. The pedo-sediment appears to be improved, in terms of soil fertility, and we therefore propose that it is the outcome of manuring enrichment for agricultural purposes. Taking advantage of the high coastal freshwater aquifer in the study area that facilitates capillary rise, we propose that this pedo-sediment represents buried agricultural plots. This study shows potential to further the knowledge and understanding regarding human societies, their connection to and impact on the environment and could be of relevance to other archaeological sites around the Mediterranean.