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Holocene coastal and palaeoenvironmental evolution in the surroundings of the Rioni Delta (Kolkheti lowlands, W Georgia)

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0.0.1 The Kolkheti (Colchis) lowlands form the central part of the extensive coastal lowlands along the Black Sea coast of Georgia. Situated between the Greater and the Lesser Caucasus, favourable climatic conditions resulted in a constant human occupation of the region during the Holocene. However, due to continuous deltaic sedimentation and progradation of the Rioni River, considerable changes of the coastal configuration and the palaeoenvironmental conditions in its hinterland are considered, which also were related to sea-level fluctuations of the Black Sea and modifications in sediment supply. Because there is a paucity of data regarding the Holocene coastal evolution of Western Georgia, this study aims to (i) determine the stratigraphy of the Kolkheti lowlands; (ii) elucidate the palaeogeographical and palaeoenvironmental changes along the Georgian Black Sea coastline; and (iii) reconstruct the (relative) sea-level (RSL) evolution in the study area, and compare these results with other regional studies.

0.0.2 Our research is based on ten sediment cores and two sediment outcrops which from the northern part of the Rioni delta area, i.e. the northern part of the Kolkheti lowlands. The sediment cores were analysed for geochemical and geophysical parameters (X-ray fluorescence spectroscopy, granulometry, loss on ignition, CN analysis) and for their microfaunal content (foraminifera, ostracoda), in order to deduce different depositional environments and their succession throughout the Holocene. The chronostratigraphy is based on 13 ^{14}C and 4 IRSL ages. Our results show that significant palaeoenvironmental changes have taken place in the surroundings of the Rioni delta during the last eight millennia. The sedimentary record indicates shallow marine conditions dominating most of the research area during the 6th millennium BC. These deposits are covered by brackish/lagoonal sediments. Lateron and floodplain-related fine-grained alluvial deposits accumulated since the 4th millennium BC. Both the lagoonal and alluvial deposits are intercalated by peat layers. ^{14}C age estimates of the different peats enable the reconstruction of the RSL evolution in the study area. The formation of the sand spit system started during the 2nd millennium BC. Luminescence dating of the oldest foredune ridges indicate a last mobilisation of the dunes between the 10th and 12th centuries AD. Based on the succession of the inferred depositional environments, we provide a valuable framework for the interpretation of the region's archaeological record, such as the identification of appropriate locations for the as yet "lost" city of Phasis.