

8000 years of coastal changes on a western Mediterranean island: A multiproxy approach from the Posada plain of Sardinia



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ABSTRACT

A multi-proxy palaeoenvironmental investigation was conducted to reconstruct the Holocene history of coastal landscape change in the lower Posada coastal plain of eastern Sardinia. In the Mediterranean region, coastal modifications during the Holocene have been driven by a complex interplay between climate, geomorphological processes and human activity. In this paper, millennial-scale human-sea level-environment interactions are investigated near Posada, one of the largest coastal plains in eastern Sardinia. Biostratigraphic and palynological approaches were used to interpret the chrono-stratigraphy exhibited by a series of new cores taken from the coastal plain. This new study elucidates the main paleoecological changes, phases of shoreline migration and relative sea-level change during the last 8000 years. These results indicate the major role of sea-level stabilization and high sediment supply in driving major landscape changes, especially during the Neolithic period (6th–4th millennia BC), and the long-term settlement history of this coastal valley area. It is concluded that human occupation of the coastal plain, from prehistoric to historical times, was most likely constrained by the rapid and constant evolution of this coastal landscape.

1. Introduction

Coastal plains contain key sediment archives to determine environmental change. In the Mediterranean region, such modifications are controlled by both natural processes and human impact. Moreover, these river valley coastal areas have always been ideal locations for settlements due to their strategic position in relation to food availability, proximity to hinterland valleys and the sea, and the control of major trading routes (Walsh, 2013; Fontana et al., 2017; Ghilardi et al., 2017a).

Along the Mediterranean coastline, coastal plains have usually developed through the combined effects of the slowing of post-glacial sea-level rise over the last six millennia (Amorosi et al., 2008; Vacchi et al., 2016) and the increase of sediment input caused by both natural and anthropogenic factors (Maselli and Trincardi, 2013; Anthony et al., 2014). This progradation trend has often resulted in the formation of

large coastal plains that became densely settled from the prehistoric times onwards, as for example at the mouth of the Arno, Po and Tiber rivers in Italy (Amorosi et al., 2008; Rossi et al., 2011; Fontana et al., 2017; Milli et al., 2013), the Rhone River in France (Vella et al., 2005), and the Llobregat and Turia rivers in Spain (Carmona and Ruiz, 2011; Daura et al., 2016).

However, multi-disciplinary studies looking at human-environment interactions on Sardinia, the Mediterranean's second largest island, are still scarce and to date have concentrated on the western side of the island (Ratto et al., 2016; Melis et al., 2017; Pascucci et al., 2018).

The large coastal plains mainly located along the western and southern sectors of the island were densely settled, especially from the Neolithic to Late Antiquity (Lilliu, 2002; Antonioli et al., 2007; Di Rita and Melis, 2013; Melis et al., 2017). In contrast, along the eastern side of the island, where the coastal plain areas are bordered by a mountainous hinterland, there are fewer known prehistoric sites. Even where

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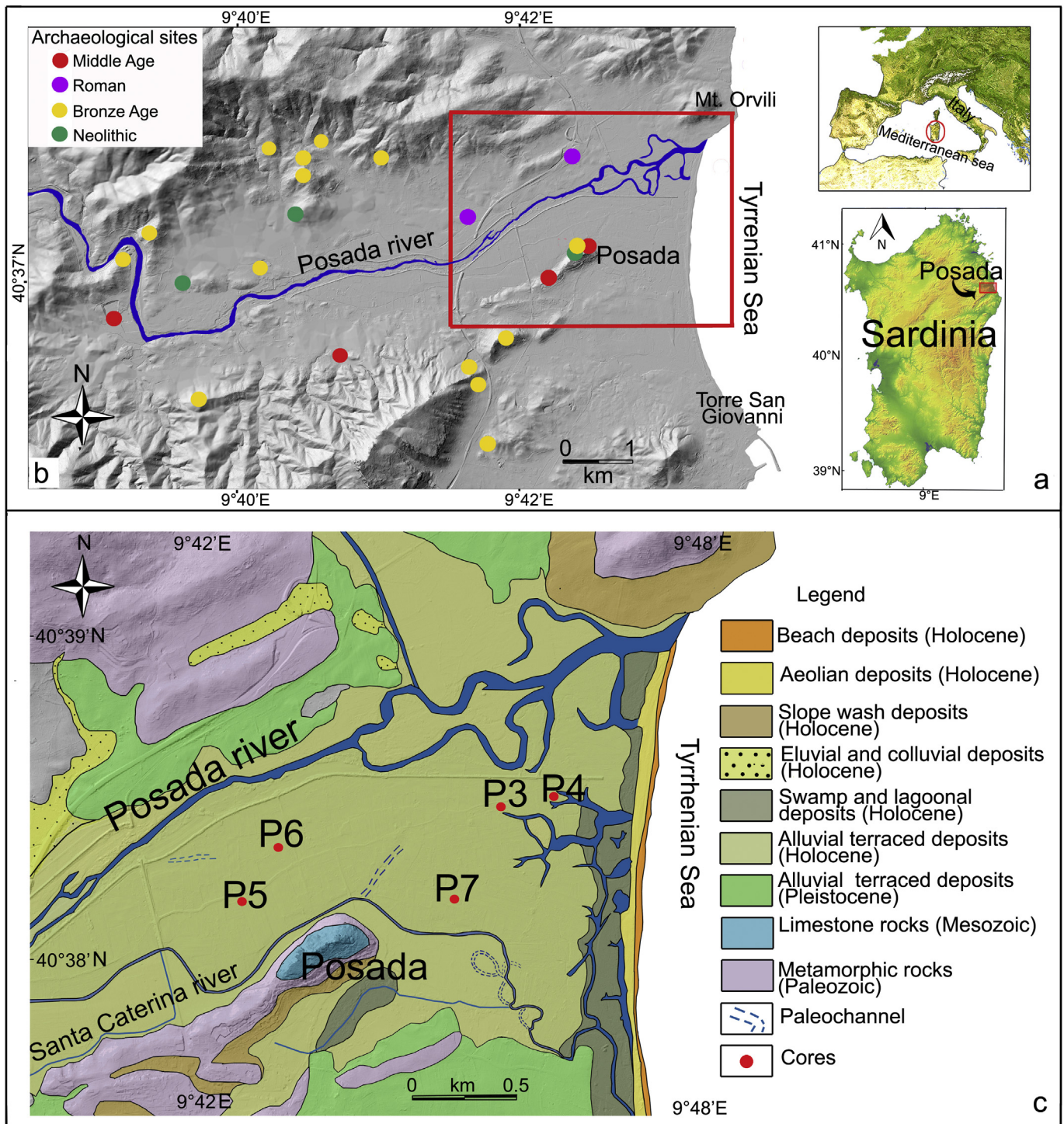


Fig. 1. a) Location of the study area on the north-east coast of Sardinia; b) distribution of archaeological sites, the box shows the location of the Posada coastal plain; c) Schematic geological map (DEM, Regione Sardegna, 2017) and location of the cores. Lat/long are provided in WGS84.

the archaeological records indicate continuous settlement since the Neolithic period elsewhere in the region (Fadda, 1984; Dyson and Rowland, 2007; Sanciu, 2011), investigations of past human-environment interactions are absent for this eastern part of the island. For this reason, the environmental modifications of the Posada coastal plain raise important questions about the landscape context of human settlement in this part of Sardinia, its evolution in space and time, and its wider relevance for understanding environmental and cultural developments at regional scales.

The present study aims to provide new stratigraphic and

chronological insights into the palaeoenvironmental evolution of the Posada coastal plain, one of the largest base-level depocenters on the eastern side of the Sardinian coastline (Fig. 1a). We assess its potential influence on human settlement in the area, and compare and contrast these records with those of other Mediterranean coastal plains during the Holocene.

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