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Reconstructing past landscapes of the eastern plain of Corsica (NW Mediterranean) during the last 6000 years based on molluscan, sedimentological and palynological analyses

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ABSTRACT

The Aleria Del Sale lagoon in Eastern Corsica provides an excellent location for palaeoenvironmental research in order to better understand the palaeogeography of the island's coastline and to disentangle the role of human and natural factors in landscape evolution. A borehole drilled to a depth of 5.30 m was located a short distance from one of the most relevant archaeological sites on the island. Environmental reconstruction methodologies included mollusc identification, sedimentological and palynological analyses combined with robust chronological control provided by 8 radiocarbon dated samples allowing the reconstruction of the coastal lagoon and the surrounding vegetation history over the last 6 millennia. The Aleria Del Sale lagoon was formed around 3500 cal BCE, when sand bars linked to the deltaic progradation of the Tavignano River enclosed shallow marine waters. Pollen data reveals the existence of a semi-open landscape at this time in which human activity was widespread. The open lagoon shifted into a confined lagoonal system around 2200 cal BCE and this change in the feature was coeval with a notable decrease in human disturbance of the area and the end of the Chalcolithic Terrina occupation. The following period saw shrub and woodland regeneration and the brackish environment continued until the 19th century CE. Human activity did not have a significant impact on the vegetation until the Genoan Period. The evolution of the vegetation history and the diverse human activity across the Eastern Plain during the Bronze Age until the Genoan Period is furthermore explored in this paper. The uppermost layers of the lithostratigraphic sequence reflect the transformation of local conditions in response to recent (20th century) drainage operations.

1. Introduction

In recent decades, work addressing past relationships between humans and the environment have flourished across the Mediterranean (Beffa et al., 2016; Di Rita and Melis, 2013; Calò et al., 2012; Tinner et al., 2016; Mercuri et al., 2012). This is not surprising considering that the region provides a long-term history of human occupation which renders past analogues for present-day issues often linked to Global Change, such as the repercussions of climate variability on human adaptability, ecological risk and resource management (Anderson et al., 2007; Dearing, 2006). Moreover, the study of past socio-environmental interactions has also become of great interest from the archaeological viewpoint, as it has significantly contributed to improve our knowledge on the development of socio-environmental interactions and the cultural landscapes linked to them, as formerly proposed by Berglund (1991).

Despite being the fourth largest island in the Mediterranean, the evolution of the socio-environmental interactions in Corsica (see Fig. 1A) and the development of past cultural landscapes are issues that have not been directly addressed. In contrast, other perspectives have often been adopted. Among them, the reconstruction of vegetation communities since the Late Glacial on the basis of the analysis of fossil pollen (Reille, 1975, 1977, 1984, 1990, 1992b; Reille et al., 1999) and charcoal remains (Carcaillet et al., 1997) should be highlighted. These pioneer works successfully addressed the history of vegetation dynamics across the island with particular regard to the relationships established between plant communities. However, this research is partially constrained by the fact that chronological control was often insufficient to establish refined correlations between vegetation change, climate and human activity.

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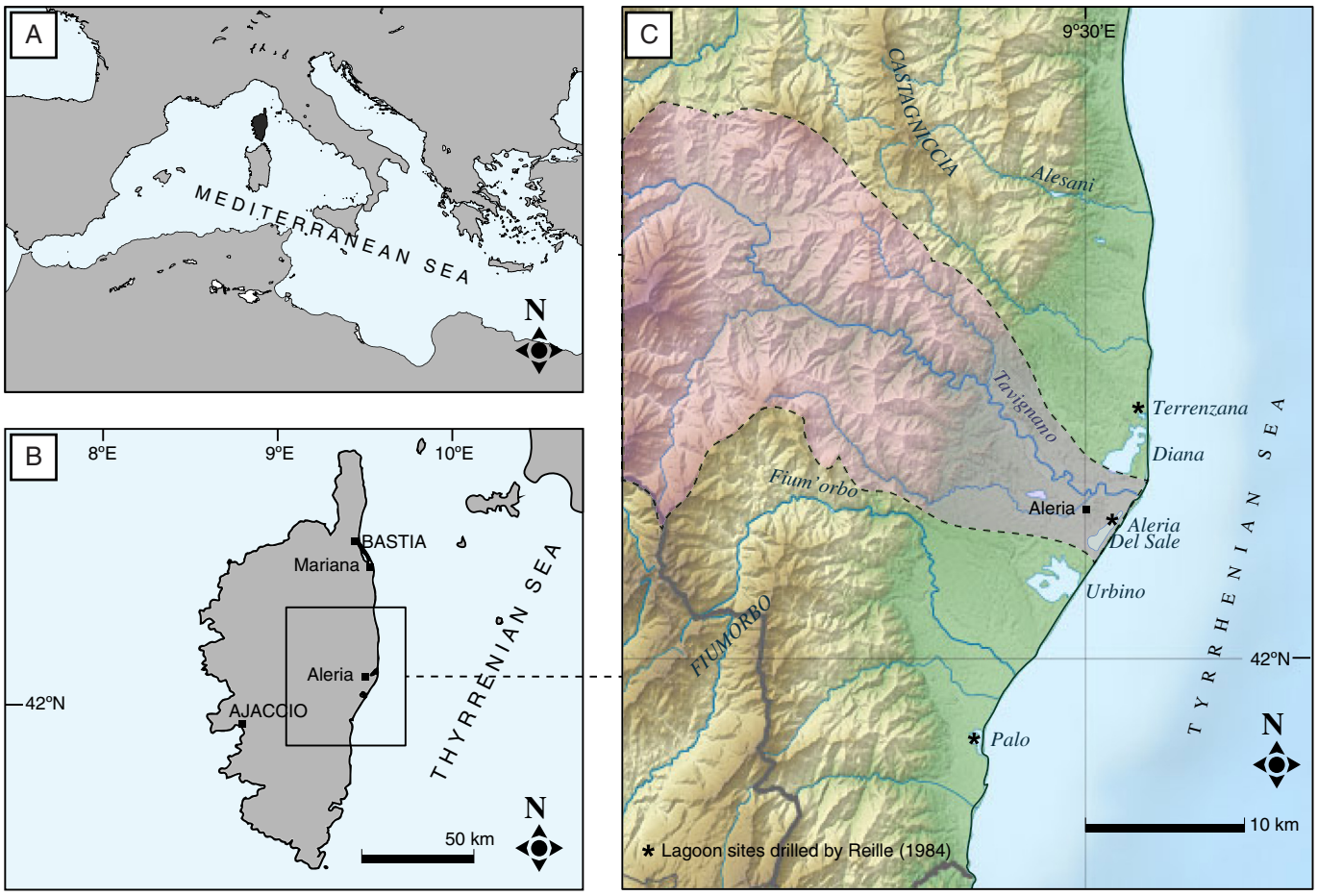

Fig. 1. Map of Corsica and location of the Eastern Corsican Plain. Picture A shows the location of Corsica (in dark gray) in the western Mediterranean. Pictures B and C show the main cities and geographical features of Corsica and the Eastern Plain, including the approximate drainage basin of the Tavignano River (in pink). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

For instance, the Eastern Plain of Corsica (Fig. 1B and C) was extensively studied by Reille (1984) on the basis of sedimentary sequences from several coastal lagoons (Aleria Del Sale, Terrenzana and Palo, Fig. 1C). The results of this research demonstrated the dominance of *Erica arborea* maquis and mesic vegetation of deciduous *Quercus* and *Taxus* during the Mid Holocene, prior to the later spread of holm oak since 3700 ± 190 BCE uncal (4492 ± 441 cal BCE, 2σ). Reille argued that the development of holm oak and subsequent sclerophyllous vegetation was linked to the onset of drier mediterranean-like climatic conditions (Reille, 1992b). However, he also suggested that the spread of human activity during the Neolithic period in Corsica (approximately 6000–3000 BCE) might have contributed to this vegetation change, particularly on the Eastern Plain, through the clearance of the deciduous trees (Reille, 1990, 1992b; Reille et al., 1999).

By taking into account Reille's hypothesis, this paper aims to provide new and more refined insights into the past socio-environmental relationships which occurred across the Eastern Plain of Corsica, a particularly interesting area of the island considering both its 6 millennia of human occupation (Camps, 1988) and the presence of diverse coastal lagoons containing palaeoenvironmental archives (Reille, 1984). Issues such as the degree and timing of the vegetation shift during the Neolithic and Chalcolithic periods are investigated. The evolution of the landscape during the subsequently chronologically-defined cultural periods are also addressed. As part of these investigations, special attention is paid to the local palaeogeography of the Aleria Del Sale wetland and its development as a coastal lagoon and evidence for associated human impact. In order to elucidate these palaeoenvironmental topics, multi-proxy sedimentary analyses of the Aleria Del Sale lagoon have been conducted. The evolution of the lagoon is addressed on the basis of mineralogy (including X-Ray Diffraction, Organic Matter content, Loss-of-Ignition), grain size distribution, geochemistry and mollusc identification, while pollen and non-pollen-palynomorphs are used to reconstruct the past vegetation changes. Under this framework, supplementary research regarding the evolution of the shoreline and past sea-level changes has been conducted, the results described in Vacchi et al. (2016a). As outlined above, addressing any links between environmental change and human activity is strictly dependent on the development of sound chronological frameworks. Consequently, priority has been given to reconstruct a reliable age-depth model on the basis of AMS radiocarbon dates.

2. Geographical setting

2.1. The Eastern Plain and Aleria Del Sale Lagoon

The Eastern Plain (so-called Aleria Plain) is a lowland area with occasional low hills located on the east-central part of Corsica (Fig. 1B and C). The Plain is bounded by the Alesani River to the north, the Castagniccia and Fium'orbo mountain ranges to the west, the Solenzara River to the south and the Tyrrhenian Sea to the east (Fig. 1C). It extends about 45 km from north to south and 10 km from west to east with the altudinal range from sea-level to 90 m asl from west to east. The total area is about 320 km^2 (Fig. 1B). In the inner part of the plain, several rivers drain westwards to the sea. Among them, the Tavignano River (ca. 90 km long with a 800 km^2 catchment area) is the longest one in Corsica after Golo River (Vella et al., 2016) and forms a delta north of the Aleria Del Sale lagoon. The sedimentary substrate of the plain consists of

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