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Mesolithic settlement and mobility patterns at high altitudes. The site of Staller Sattel STS 4A (South Tyrol, Italy)

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ABSTRACT

This paper presents the results of an ongoing research aimed at reconstructing Early Mesolithic settlement strategies and mobility patterns at high altitudes of Alpine area focusing on the interactions and possible mutual influence between human behavior and the geomorphological and environmental context. Due to the high-altitude environment, research had to face the effects of post-depositional processes on anthropogenic remains. Investigations have been carried out on a terrace in the Ackstall locality, south of the Staller Sattel/Passo Stalle (Italian–Austrian border, Central Eastern Alps), covered by coniferous vegetation since the Preboreal. The terrace, central with respect to the available resources and in a strategic position within a reconstructed route system conjoining different sites and adjacent hunting territories, yielded several lithic findspots. One of these, the excavated open-air site STS 4A lying at 2125 m a.s.l., revealed human site frequentation dating at least between 7370 and 6590 cal. BC. Human occupation was established on a forested soil, subsequently buried, indicated as "paleo-podzol". Stratigraphy, micromorphology and artifact distribution, this latter showing a ring-shaped pattern, suggest the preparation of the living space by manipulating the existing soil cover. Anthropogenic remains indicate on-site activities as wood carving, exploitation of rock crystal and chert for tool manufacture and the probable consumption of plants originating from lower altitudes. Several features, some of which connected with fire use, have been identified. Fuel was collected in the form of dead wood in the open larch and stone pine forests surrounding the site. The comparison of multiscale data allowed to get insights on the living space of a Mesolithic hunter–gatherer camp. Integrating detailed data from the excavation of a single site with the wider territorial context investigated by surveys allowed to draw a multi-facetted picture of Early Mesolithic lifeways and highlighted the potential of research on the "ephemeral" high altitude sites.

1. Introduction

The evidence of the Mesolithic peopling discovered since the early 1970s in the Alps, yielding an unexpected site concentration in the subalpine and alpine altitudes, attests the high adaptation ability of hunter–gatherer communities living in an articulated landscape with a wide variety of environments during a period of rapid climate change (VV.AA. 1983, 1992, 2002; Oeggl et al., 1997; Crotti, 2000). The reconstruction of Early Mesolithic lifeways, representing the first systematic mountain frequentation of the Inner Alps, contributes to the understanding of the changing use of a territory which, apparently hostile to human settlement, has been

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[1] The different parts of the article were elaborated as follows: "Methodology" and "Conclusions": all authors; "Stratigraphy" and "Spatial analysis": MB, NHK, KK, UW; "Planned site discovery", "Anthropogenic features" and "Preliminary remarks on the lithic industry": NHK, KK, UW; "Introduction" and "^{14}C-AMS datings and calibration": UW; "Geological and geomorphological setting", "Soil micromorphology" and "Interpretation of the Holocene soil formation related to the Mesolithic occupation": MB; "Botanical remains": EC, MR. "Mobility, routes and site typology": NHK, KK. The excavation permit is hold by KK and UW.

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deeply transformed since prehistoric times and became fragile in modern times, due to intensive human impact and global warming.

The present work aims at reconstructing Early Mesolithic settlement patterns and mobility in the high altitudes, with a special focus on the interactions between natural phenomena and human behavior in the Alpine and Subalpine belt. How determinant are geomorphological and environmental aspects in site choice by human communities? What are the repercussions of human activity on natural processes? How was the evidence of human presence affected by natural post-depositional processes?

The studied area lies in the Central Eastern Alps near the Staller Sattel/Passo Stalle pass at Rasen-Antholz (South Tyrol, Italy). The here presented and compared multiscale data originate both from systematic surveys and from the excavation of a new open-air site, STS 4A, located south of the cited pass (Fig. 1).

1.1. History of regional research on the Early Mesolithic

The chrono-cultural and economic framework of the Sauveterrian peopling of the southern side of the Central-Eastern Alps, corresponding to the Adige basin and the surrounding mountain chains, is based on few stratified sites excavated in the Adige valley bottom (Broglio, 1971, 1980, 1992; Boscato and Sala, 1980; Broglio and Kozlowki, 1983; Battaglia et al., 1992; Tagliacozzo and Cassoli, 1992; Bagolini and Pedrotti, 1995; Bazzanella et al., 1997, 2007; Kozlowski and Dalmeri, 2000; Dalmeri et al., 2002; Wierer and Boscato, 2006; Coltorti et al., 2009). The sites, mostly rockshelters upon debris cones bordering the main river valleys and lying at 150–250 m a.s.l., were repeatedly frequented by hunter-fisher-gatherer communities since the end of the 10th millennium cal. BC. In addition to these lowland sites, more than 500 highland sites concentrated between 1800 and 2300 m a.s.l. are to date known in the Provinces of Bolzano, Trento and Belluno (Bagolini et al., 1983; Lunz, 1986; Niederwanger, 1986, 1991, 1999; Broglio, 1992; Dalmeri and Pedrotti, 1992; Kompatscher and Hrozny Kompatscher, 2007). Their location in the timberline ecotone, the transition zone between the forest and the alpine grasslands, was particularly suited for hunting, as ecotones are characterized by a greater variety of species and density of individuals (Odum, 1971). Human frequentation at this altitude is thus connected with hunting in the warm season. The seasonal frequentation limited to summer–autumn is deduced by the rigid winter climate with abundant snowfalls. Subsequent seasonality analyses on two sites with faunal remains confirmed this assumption (Alciati et al., 1992; Angelucci et al., 2002; Fontana et al., 2009).

Fig. 1. Map of the region with the Staller Sattel/Passo Stalle (Rasen-Antholz, South Tyrol, Italy) on the Italian–Austrian border (Tirol-Atlas, Universität Innsbruck, Austria).

A direct relationship between low- and highland sites could be established on the base of common techno-typological features displayed by lithic assemblages and the complementarity of their lithic raw material. This led to the elaboration of a vertical seasonal mobility model (Broglio, 1980, 1992; Lanzinger, 1985, 1996; Bagolini and Dalmeri, 1987; Broglio and Lanzinger, 1990). On the base of site topography and the typo-technological composition of lithic assemblages, the model describes a settlement system consisting of valley bottom residential camps and by mountain sites with differentiated functions. In the former, displaying a high variety of faunal remains and lithic assemblages with a well-balanced proportion of armatures and domestic tools, various activities related to a broad spectrum economy were carried out. Whilst these are intended also as winter sites, the mountain sites were used only during the warm season, mainly for hunting. These latter have been further distinguished in mountain residential camps for domestic activities, characterized by the well-balanced proportion between armatures and domestic tools, and hunting look-out posts for the observation of animals and the retooling of weapons, as documented by the high frequency of armatures and microburins.

Recently, due to a higher complexity of settlement patterns indicated by new data, the need for a revision of the model has been stressed (Cusinato et al., 2003; Grimaldi, 2005, 2006; Bazzanella et al., 2007; Fontana, 2011; Peresani and Miolo, 2011; Wierer et al., 2015).

Early Mesolithic peopling of the areas further to the North, along the Alpine watershed and in the adjacent mountain chains, was first revealed by the systematic surveys of W. Aichberger and R. Lunz, both north and south of the Italian–Austrian border (Lunz, 1986). A new research impulse, especially on the Austrian side of the Alps, was given by the discovery of the 5300 year old ice mummy of the Tisenjoch, in September 1991, leading to the discovery of new Early Mesolithic sites in North and East Tyrol, some of which object of excavation (Leitner, 1995; Oeggl et al., 1997; Schäfer, 1998, 2004; Kompatscher and Kompatscher, 2011). Despite the more rigid climate on the northern side of the Alps, its peopling both by Sauveterrian and Beuronian groups occurred contemporaneously on the southern side (Schäfer, 2011). The existence of long-distance contacts and routes, already indicated by the complementary raw material diffusion (south alpine Mesozoic cherts towards north and rock crystal from the Alti Tauri/Tauernfenster, as well as cherts from the Rofan towards south and east (Broglio and Lunz, 1983; Schäfer, 1998; Mahlknecht, 2002; Peresani and Ferrari, 2002; Kompatscher and Kompatscher, 2005, 2011; Pessina and Bassetti, 2006; Fontana et al., 2009), has recently been proved by petrographic analyses. These attest the circulation of Cretaceous cherts from the Non Valley (Trentino) in the Stubaier Alps already during the Early Preboreal (Bertola, 2011).

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