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# New evidence of human frequentations in the western Alps: The project "Survey Alta Valsessera (Piedmont–Italy)"

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ABSTRACT

The Sessera valley is an under-populated Italian alpine valley located in the north-eastern Piedmont (northwest Italy) between the provinces of Biella and Vercelli. We discuss the data obtained during the first and the second year of the project "*Survey Alta Val Sessera*" held in 2013 and in 2014 under the scientific direction of *Soprintendenza Archeologia del Piemonte* in collaboration with *Associazione Culturale 3P – Progetto Preistoria Piemonte* and *DocBi – Centro Studi Biellesi* that had as its main purpose the identification of new prehistoric human frequentations in the valley. The theoretical scheme employed starts from the one developed for Trentino and the South Tyrolean region (north-eastern Italy) by Broglio and Improta. During the campaigns, surveys in the Sessera and in the neighbouring Dolca valley have been carried out using the patterns of settlement and mobility in the alpine environment developed by Kompatscher and Kompatscher, in order to identify the most interesting areas to investigate. The most important results obtained during the first two survey campaigns indicate that the Sessera valley was occupied by human groups using knapped lithic industries made of local vein quartz. Another important result is the identification of a Late Ancient site located at high altitude (1642 m a.s.l.) along one of the ridge paths investigated. Even if the lithic findings have no diagnostic elements for a precise chronological positioning, the importance of the data obtained consists mainly in having successfully tested a method of research aimed at identifying human frequentations at high altitude in this part of Piedmont, where no comparable research has been carried out until now.



## 1. Introduction

Since the beginning of the 1960s, not considering the sporadic and unreliable nineteenth-century information, there was not any evidence supporting a human presence in Piedmont (north-western Italy) during the Palaeolithic and the Mesolithic. At that time, this lack of evidence was attributed to the persistence of hostile environmental conditions during the whole Pleistocene (Fedele, 1985). As it would be unlikely that a region like Piedmont, habitable and rich in natural resources, was not occupied by Palaeolithic and Mesolithic hunter-gatherers (Guerreschi and Giacobini, 1998), nowadays it is possible to state that the scarcity of data is certainly due to the lack of systematic research concerning these periods. Particularly concerning the Mesolithic, the data available are scarce, with the exception of the Alpe Veglia site

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(north-eastern Piedmont), where the studies carried out by A. Guerreschi during the 1980s and the 1990s led to the discovery of a lithic industry dated to the ancient Mesolithic and mainly made of local hyaline quartz (Gambari et al., 1989). Some other sporadic findings are those from the Piedmontese localities of Pratomorone (Mottura, 1993), Agrate Conturbia (Biagi, 1988) and Boira Fusca (Fedele, 1990). In such an incomplete framework, it is clear how difficult is to understand the modalities and the peculiarities of the Mesolithic peopling of the Piedmont.

The project "Survey Alta Valsessera" was born in 2013 with the aim to partly fill the existing gap in the scientific research concerning the prehistoric peopling of Piedmont. The research is part of the multi-year "Project Alta Val Sessera" promoted by *DocBi — Centro Studi Biellesi* since 1992, concerning different issues about this territory such as geology, flora and fauna, archaeology, history, toponymy and transhumance, thus allowing the survey campaigns to start shortly and with a good knowledge of the area.

According to the methodology employed (Broglio and Improta, 1995; Kompatscher and Kompatscher, 2007), the choice of the high Sessera valley as the starting point for this kind of research was based on an accurate analysis of the available regional cartography in order to identify all the areas that, from a geomorphological point of view, could have been interesting for the research. The first two campaigns were realized in 2013 and in 2014 under the scientific direction of *Soprintendenza Archeologia del Piemonte* in collaboration with *Associazione Culturale 3P- Progetto Preistoria Piemonte* and *DocBi — Centro Studi Biellesi* and led to the identification of twelve sites characterized by the presence of lithic industries made of local vein quartz and of a Late Ancient site with abundant pottery remains and two fragmented iron artefacts (Rubat Borel et al., 2014, 2015).

## 2. Geological background

The Sessera valley is located in the marginal land between the north-eastern part of Piedmont and the Aosta valley (Fig. 1) and it is characterized by the presence of the tectonic Canavese Line and two large lithological complexes: the Ivrea-Verbano Zone and the Sesia-Lanzo zone (Fig. 2).

The Canavese Line, oriented NE–SW, consists of a series of fractures stretching through the two main depressions that link the Sessera valley with the Biella territory and the Sesia valley, located near Bocchetto Sessera (1373 m a.s.l.) and Bocchetta della Boscarola (1423 m a.s.l.). This tectonic lineament represents a western portion of the wider tectonic system, the Insubric Line (Compagnoni et al., 1977; Dal Piaz, 2001; Zucali and Spalla, 2011; Roda et al., 2012). The Canavese Line connects two very different rocky complexes. The outcrops on the left of Bocchetto Sessera are the igneous rocks of

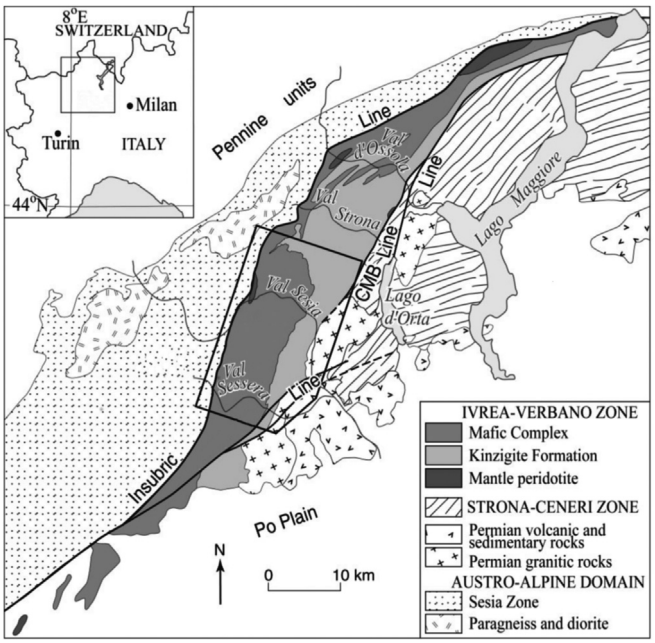


**Fig. 2.** Geological and structural map of the Alpine region. In the box, detail of the Sessera valley (modified from Peressini et al., 2007).

the Sesia-Lanzo series and represent the European continental margin known as Austroalpine nappes. Downstream, on the right of Bocchetto Sessera, there is the wide rocky series of the Ivrea-Verbano zone that represents the equivalent continental margin of the African lithospheric plate (Southalpine nappes). In the Sessera Valley, there are only rocks of the basic–ultrabasic complex (Sesia-Lanzo zone), and the prevailing lithotype is a gabbro-diorite medium-large grained, made up of basic plagioclases and pyroxenes that belong to the Penninic nappes and are present in the eastern part of the Sessera valley.

The Sesia-Lanzo Zone belongs to the Austroalpine nappes and it can be related to the Sesia-Lanzo series, made up of polymetamorphic rocks present in the north-eastern part of the Pennine Alps, including the heads of the main valleys and the highest peaks. It is divided in different lithological complexes (Dal Piaz et al., 1972; Compagnoni et al., 1977) and locally, in the neighbouring of Alpe Isolà (1560 m a.s.l.) and Alpe Piovale (1507 m a.s.l.) up to Cima del Bonòm (1877 m a.s.l.) (Fig. 4), there is a wide area with syenite outcrops. Eastwards, from Bocchetto Sessera along the Canavese Line (Fig. 4), there is a small belt of diabases, amphibolite porphyrites, calcareous outcrops. The Biella pluton, visible on the

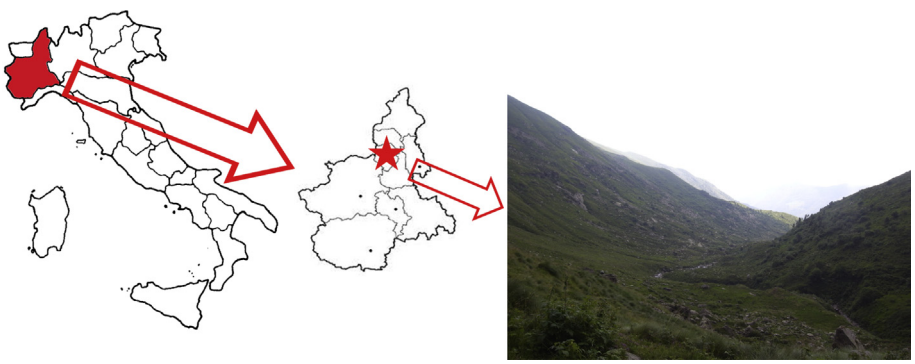

**Fig. 1.** Localization of the Sessera valley.

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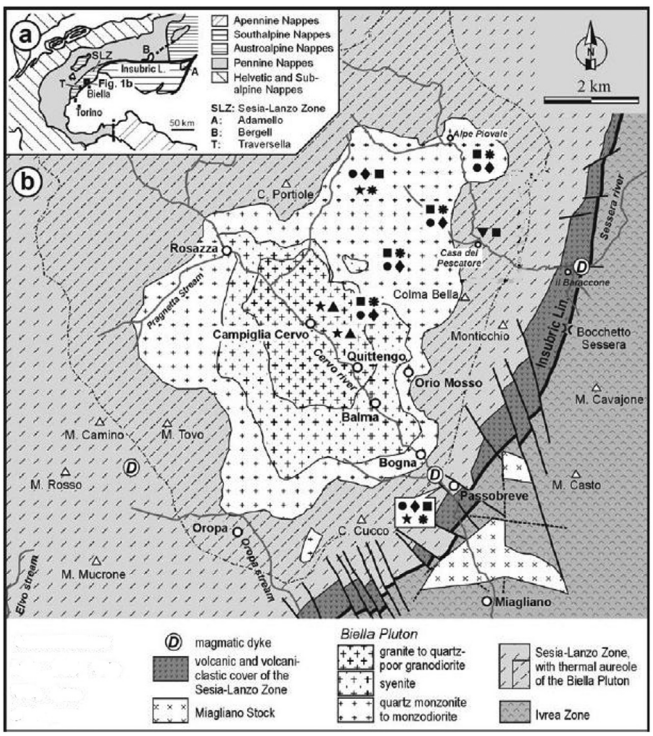


**Fig. 3.** Geological sketch map of the Cervo and Sessera valleys and lithological subdivisions of the Biella pluton (Rossetti et al., 2007).

right orographic side of the valley (Fig. 3) (Bigioggero et al., 1994; Romer et al., 1996; Rossetti et al., 2007), is a magmatic unit linked to the post-collisional formation of the western Alps.

Another geological process that contributed to the formation of the Sessera valley is represented by the glacial events occurred in the Pleistocene/Quaternary era (Fig. 4). The Last Glacial–Interglacial cycle ends with the beginning of the Holocene and inside the cycle are recorded three major glacial episodes: about 100 ka (MIS 5d), 75 to 60 ka (MIS 4) and 30 to 11.5 ka BP (MIS 2). The last episode, includes a step of acme called Last Glacial Maximum (LGM – 29-19 ka cal BP) and a subsequent reduction of the ice sheet called Late glacial and Late Würm (19-11.5 ka cal BP) (Orombelli et al., 2005). Many studies (Dansgaard et al., 1989; Johnsen et al., 1997; Friedrich et al., 1999; Merkt and Muller, 1999; Litt et al., 2003) show the correlation between palynological, isotopic and dendrochronological data for the upper limit of the Late glacial that is unambiguously placed in correspondence of an abrupt event, (Peyron et al., 1998) which coincides with the beginning of the Holocene at 11,550 ± 50 cal. BP (Gibbard, 2004).

Concerning the investigated area, studies about the variations in the upper limit of glacial erosion (trimline) recognize the Würm glaciation as the predominant glacial phase (Finsinger and Ribolini, 2001; Ivy-Ochs et al., 2008). The Würmian glacial maximum in the Alps occurred between 28,000 and 20,000 ± 1800 BP in the northern Alpine foreland (Florineth and Schlüchter, 2000) while the beginning of the retreat of the Würmian glaciers can be dated 14,190 ± 130 BP (Ponel et al., 2001; Hughes et al., 2006). The reconstruction of the glacial margin fluctuations of the morainic amphitheatre of Ivrea (Piedmont) support the hypothesis that the Late Würm had phases of glacial recession (Gianotti et al., 2008). In the Alps, during the Late Würm, large valley glaciers formed as glaciers flowed out of the main accumulation areas and ice domes (Florineth and Schlüchter, 2000, 1998). The glacial/inter-glacial cycle produces typical landforms and morphologies such as U-shaped valleys, cirque glaciers and staircase cirques (Benn and Evans, 1998; Pidwirny, 2006). In the high Sessera valley, two accumulation zones of the Würmian glaciers are visible: the first one is located between the Cravile (2384 m asl) and the Del Mauro (2506 m asl) peaks, while the second one is located between the Cravile and the Guardia (2007 m asl) peaks (Fig. 4). In the first accumulation areas, looking at the trend of the contour lines, the presence of staircase cirques is clear, where two or more cirques occur one above the other (Gordon, 1977), thus corresponding to different phases of retreat of the glacier during the last inter-glacial period. Moreover, the presence of some small lakes in the highest cirque glacier (1900 m asl), in flat and slightly sunken areas, indicates the final stage of the glacier before its retreat in the northernmost areas during the Holocene (Hormes et al., 2001).

### 2.1. Geomorphological framework

The geomorphology of the high Sessera valley is closely related to the shaping action of the glaciers and particularly to the action of the galciers during the Late glacial, when they covered some areas of the Sessera valley and the neighbouring Dolca valley (Fig. 4). During the following interglacial phase, the presence of several streams led to the erosion of the existing deposits, thus producing the present configuration of the valley. The rock-bed emerges diffusely over 1600 m a.s.l. and along the main streams, where the glacier action and the water erosion removed the moraines and the alluvial cover. The setting of the slopes through gravitational processes led to the generation of landslides with the subsequent formation of accumulation zones and of accumulations of slope mixed detritus. These deposits can be easily identified all along the valley's slopes, but the typical shapes are located within the plain of Tegge dell'Artignaga (1400 m a.s.l.) and around the three glacial lakes below Cima d'Ala (1900 m a.s.l.). In some areas, the lower steepness of the slopes allowed the formation of wide grazing areas, identifiable with the Balma zones (Fig. 4).

The investigated area is characterized by the presence of wide screes, fed by the mechanical break-up of the rocky slopes located in the cirque glacier area and at the feet of the highest peaks (Punta del Cravile, 2384 m a.s.l.; Punta del Mauro, 2506 m a.s.l.; Cima del Bonòm, 1877 m a.s.l.). The Sessera creek flows toward north-east within the diorites, crosswise to the lay of the lithological units and to the run of the main tectonic faults, setting itself within the beds of the Pleistocene glaciers. The Sessera valley is bordered, on one side, by the watershed with the Sesia valley and, on the other side, by the watershed represented by the Bo peak (2556 m), the Marca mount (1625 m) and the Rubello mount (1412 m), facing directly the Biella plain located more than 1000 m below. The observation of the Sessera valley from the homonymous Bocchetta highlights the presence of several and widespread gravitational phenomena all along the slopes, linked to the presence of the tectonic discontinuity. Looking south-east, the lengthened exposure at low altitude and the decay of the kinzigites and of the granites created a hill landscape with thick vegetation. The slopes' dynamics is mainly linked to the stream activity and to the mass gravitational phenomena. The slopes' high energy and the presence of several streams create the condition for intense erosion of the Quaternary deposits, represented by screes and ancient glacial deposits. At lower altitudes, wide gravitational accumulations are present, partly quiescent.

## 3. Materials and methods

The geological and geomorphological features of the high Sessera valley made necessary the employment of specific methods for

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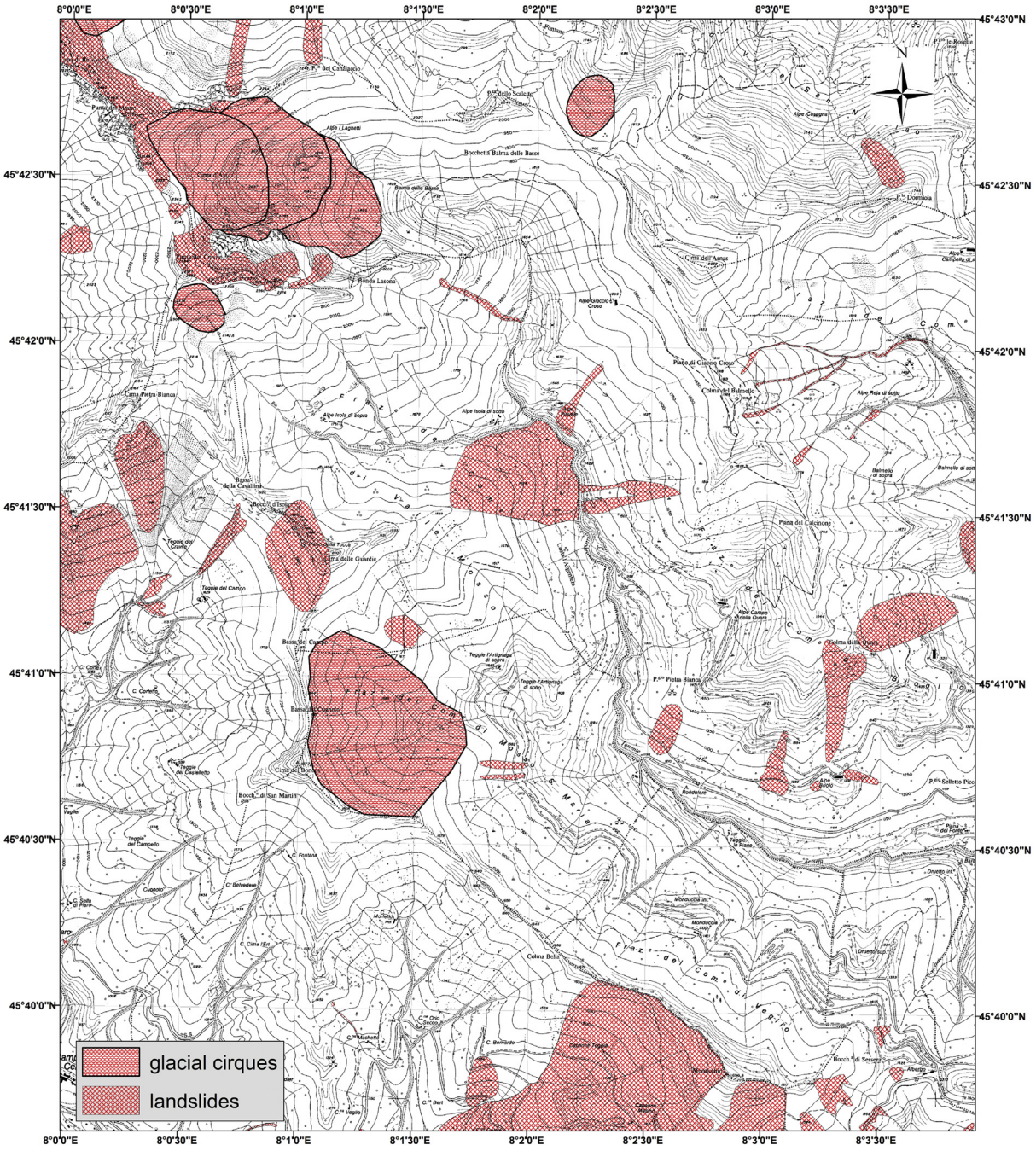


**Fig. 4.** Map of the high Sessera valley. In red are highlighted the glacial landforms and deposits visible in the area.

the development of the research project. The interpretative model used in this work is based on the one developed for the research of Mesolithic sites in the eastern Alpine region by Broglio and Improta (1995). In recent years, this model was successfully employed in the western Alps: i.e. the research carried out by *Ufficio Beni Archeologici della Valle d'Aosta* and the University of Ferrara at Monte Fallère (Aosta valley) (Raiteri, 2009). It distinguishes between high altitude sites, located between 1900 and 2300 m a.s.l., and valley bottom sites, multi-stratified and usually located in small rock-shelters and at lower altitudes (210–250 m a.s.l.). The high altitude sites show recurring locations in the geographical context, thus allowing the identification of reference settlement models: rock-shelters, next to big erratic boulders; open air sites not far from alpine lakes; along the ridge paths, in correspondence of mountain passes or in a dominant position over the surrounding territory (Broglio and Improta, 1995). Because of its orography, in the high Sessera valley the only identifiable sites are the high-altitude sites. The identification of the areas with a potential archaeological interest was based on the work of Kompatscher and Kompatscher (2007). Assuming that no great tectonic changes occurred in the alpine region from the last glaciation, and that the communication routes, like ridge paths and mountain passes, are basically the same used today (Mannoni, 1994a, 1994b), they identify some parameters useful for the identification of prehistoric human frequentations at high altitude: water supply, wide view of the surrounding territory, suitability of the area for the setting of a

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camp, position of the area with regard to the main paths, availability of wide hunting and gathering areas, orientation of the slopes, and natural protection against the main wind direction (Kompatscher and Kompatscher, 2007).

The areas to investigate were chosen after the analysis of the available cartography and considering the geomorphological constraints. Afterwards, the suitability of each area was verified *in loco* and soundings were done in all the areas filling at least two of the criteria listed above.

Due to the aims of the research project and the geomorphological context, a non-systematic territorial sampling was chosen (Terranato, 1992; Cambi, 2000). Starting points for the identification of the most interesting areas to investigate have been the analysis of the available cartography and the geological study of the territory (Casoli and Biasetti, 1997; Biasetti, 2002, 2007). The availability of lithic raw materials, the presence of water sources and the orographic conditions were primarily considered. In this way, the following areas were investigated during the survey campaigns in 2013 and 2014 (Figs. 5–7): the valley going from Alpe Piovale (1507 m a.s.l.) to the Bo lakes (1900 m a.s.l.), the side valley going from Alpe Piovale to Alpe Isolà (1560 m a.s.l.), the plateaus Tegge dell'Artignaga (1400 m a.s.l.) and Campo di Quara (1475 m a.s.l.) and the ridge path connecting Bocchetto Sessera (1373 m a.s.l) to Colma Bella (1650 m a.s.l.). In these areas, the turf was lifted on a surface of 50 × 50 $cm^2$ with subsequent restoration of the previous conditions, while in the areas where the turf was already lifted by the passage of cattle an intense survey activity was carried out. For each sounding, the superficial turf was removed, while the subjacent ground was not excavated; in this way, each sampling is between fifteen and 30 cm deep. According to Terranato (1992), we use the term "site" to indicate every surveyed area where at least one artefact was found. During the survey campaign, the waypoints were collected with a GPS in the UTM WGS84 coordinate system. The software QGis was used for the spatial distributions of the evidence (i.e. the soundings, the surveyed areas and the raw material outcrops).

The techno-typological study of the lithic industries is based on the works of Inizan et al. (1995) and Pelegrin (2000) for the identification of the knapping techniques, on the works of Forestier (1993) and Tixier et al. (1984) for the identification of the knapping methods and on the works of Laplace (1968) and Broglio and Kozlowski (1984). As the lithic industries found are made of vein quartz, it was necessary to refer specific works (Mourre, 1996; De Lombera-Hermida, 2009). As the investigated area is rich in vein quartz outcrops and therefore in vein quartz ecofacts, only the lithic artefact showing clear knapping scars (presence of butt and bulb and/or visible negatives on the upper face of the flakes) have been collected during the survey activities.

The charcoal fragments found in some of the samplings were analysed with a stereomicroscope Optika Bmet 500, using different magnifications (×50, ×100, ×200, ×500), through the observation of the three main sections of wood: transversal section, longitudinal tangential section and longitudinal radial section. The identification of the species was made using the Wood Anatomy Atlas (Jacquiot et al., 1973; Schweingruber, 1990).

## 4. Results

### 4.1. Survey 2013

The preliminary survey campaign carried out in 2013 and lasting four days, led the identification of nine sites characterized by the

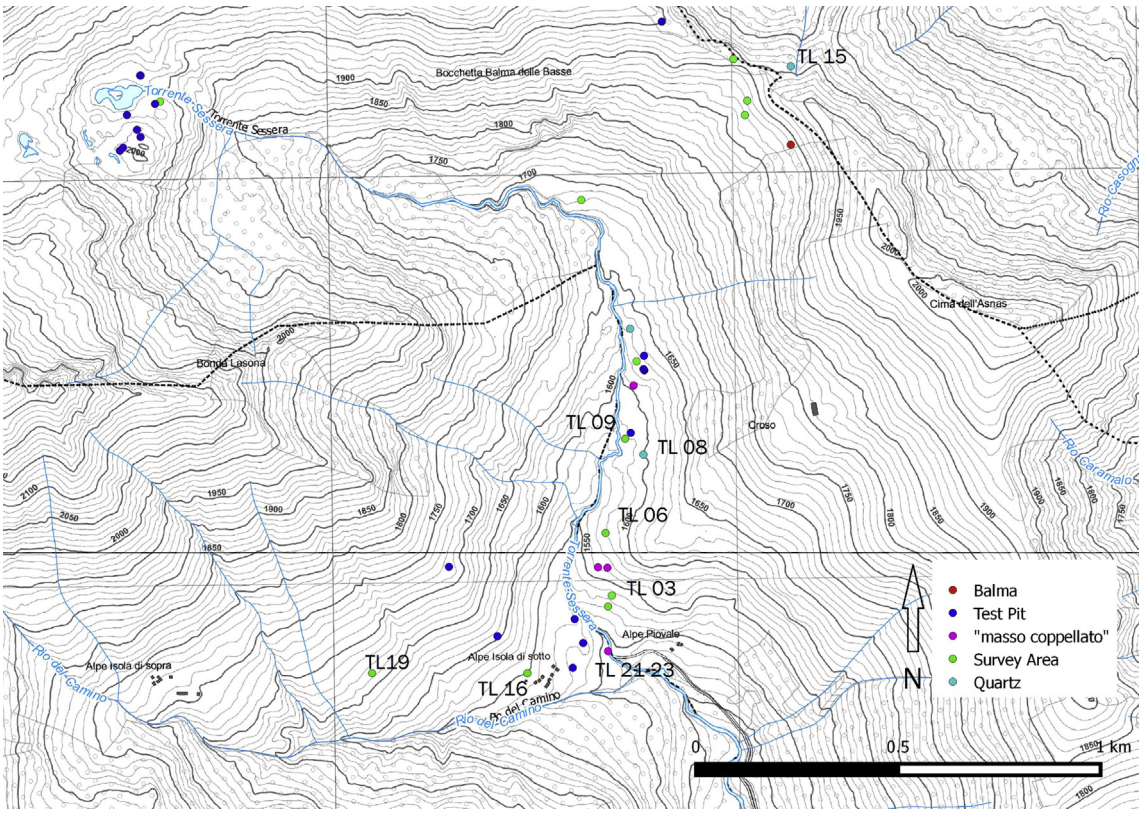


**Fig. 5.** Map showing all the waypoints collected during the 2013 survey campaigns in the high Sessera valley with indication of all the samplings and the survey areas. The abbreviation TL indicates the samplings or the survey areas located in the valley from Alpe Piovale (1507 m a.s.l.) to the Bo lakes (1900 m a.s.l.) where lithic industries were found.

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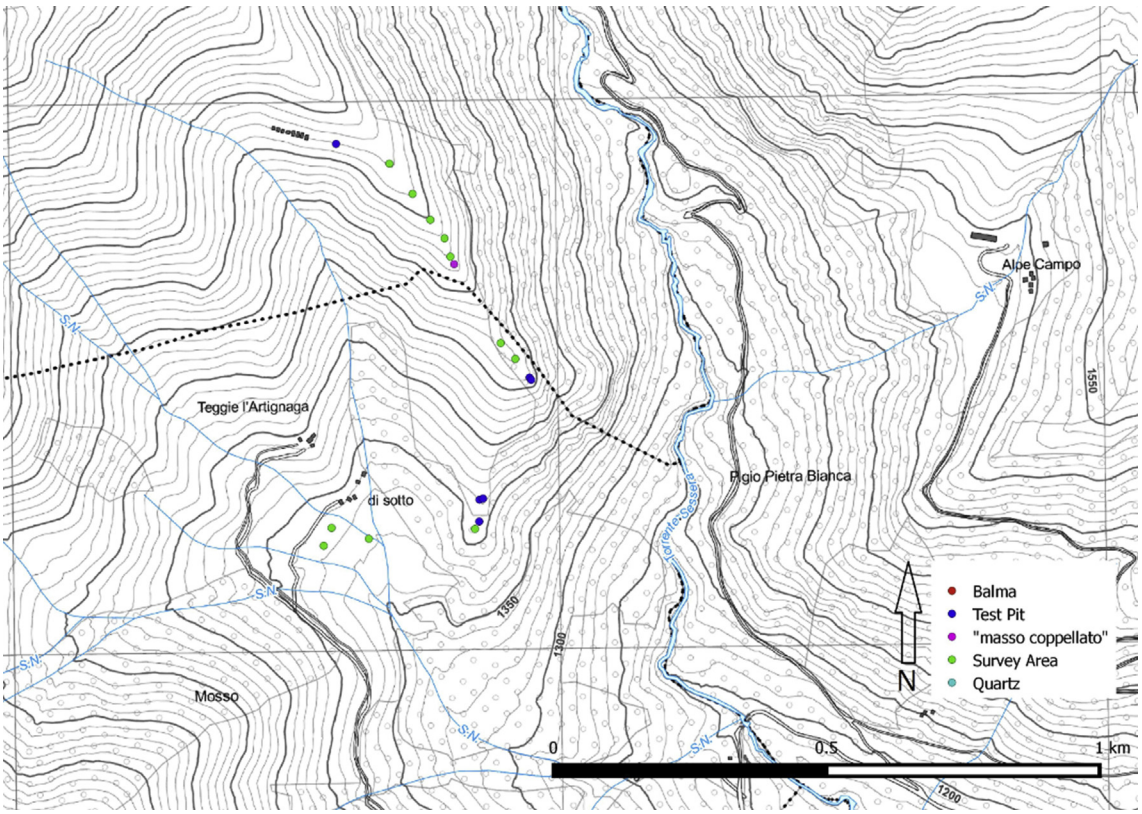


**Fig. 6.** Map showing the waypoints collected during the 2014 survey campaigns at Tegge dell'Artignaga. In this area no archaeological evidences were found.

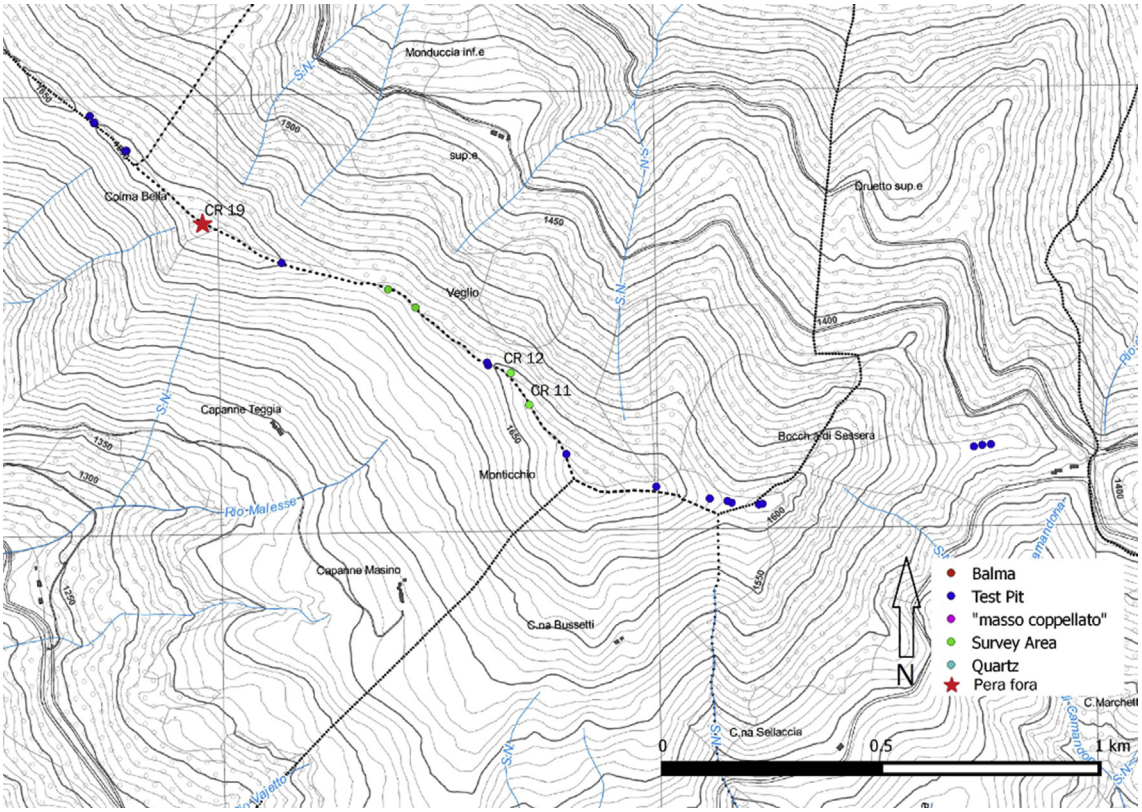


**Fig. 7.** Map showing all the waypoints collected during the 2014 survey campaign along the ridge path connecting Bocchetto Sessera (1373 m a.s.l.) to Colma Bella (1650 m a.s.l.). The abbreviation CR indicates the survey areas where lithic industries were found. CR 19 is the Late Ancient site of *Pera Forà*.

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presence of lithic industries made of local vein quartz (Rubat Borel et al., 2014). The cartographic study identified three areas potentially interesting for the research, but just two of them showed signs of prehistoric human frequentations.

All the sites are located in the deep valley from Alpe Piovale (1507 m a.s.l.) to the Bo lakes (1900 m a.s.l.) and in the side valley from Alpe Piovale to Alpe Isolà di sopra (1670 m a.s.l.), not far from the head of the Sessera valley (Fig. 5). Nine samplings have been done during the research in these valleys: three of them gave lithic industries made of local vein quartz, while six lithic artefacts come from the survey activities carried out all along the paths and where the turf was lifted by the passage of cattle (Fig. 8). This preliminary research concerned the orographic left side of this two valleys, while it was not possible to reach the area of the Bo lakes due to bad weather conditions. The lithic industries do not present any diagnostic element for a precise chronological collocation of this human frequentation of the Sessera valley, but a hypothesis concerning the *châine operatoires* carried out can be formulated. The presence of not-prepared butts and the low number of negatives visible on the upper face of the flakes suggests short *châine operatoires* with a mainly opportunistic exploitation of the cores for the production of small flakes with at least one cutting edge. The core found in the sounding TL 19 and the dimension of the product, show that a choice was made for decimetric pebbles collected in secondary positions in the riverbeds of the streams crossing the valley. The exploitation started from the flat surface of a natural breakage without any phase of shaping of the core (Fig. 8). Only the improvement and the prosecution of systematic researches in this area will enable understanding of the chronology and the importance of this prehistoric frequentation of the Sessera valley.

The research conducted in the Alpe Carnera area (1625 m a.s.l.) did not produce any archaeological evidence. Two samplings have been done in this area, close to two small rock-shelters, while survey activities were carried out in the areas where the turf was lifted by the passage of cattle. Even if the area is rich in primary outcrops and in secondary deposition vein quartz, no lithic artefacts have been found.

This preliminary campaign also allowed the identification and the GPS positioning of three primary outcrops of vein quartz (Fig. 9) located in the investigated areas. Vein quartz is also present as prismatic decimetric and centimentric blocks in the riverbeds of the Sessera stream and of all the other creeks crossing the valley.

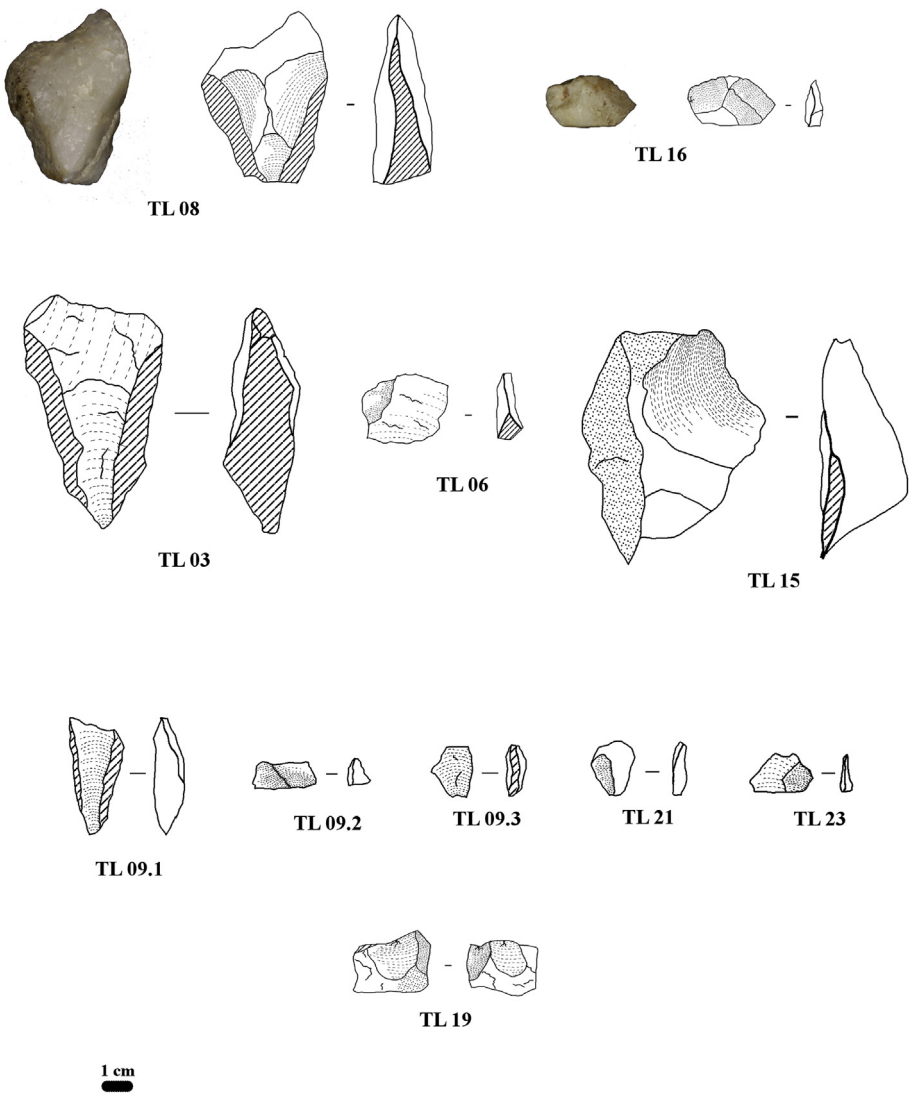


**Fig. 8.** Vein quartz lithic industries found during the 2013 survey in the high Sessera valley. TL 08, TL 16 and TL 21: complete flakes; TL 03, TL 09.1, TL 23: distal fragments; TL 06, TL 09.2, TL 09.3, TL 15: incomplete flakes; TL 19: core.

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**Fig. 9.** Primary outcrop of vein quartz identified during the survey in the high Sessera valley, between Alpe Piovale (1507 m a.s.l.) and the Bo lakes (1900 m a.s.l.).

### 4.2. Survey 2014

The good results obtained during the preliminary campaign were the starting point for a further investigation in the high Sessera valley. The aims of this campaign, lasting one week, were the extension of the surveyed territory and a more intensive investigation of the areas where, during the preliminary campaign, lithic artefacts have been found, i.e. the valley from Alpe Piovale (1507 a.s.l.) to the Bo lakes (1900 m a.s.l.) and the side valley from Alpe Piovale to Alpe Isolà di sopra (1670 m a.s.l.) (Fig. 5), involving both the sides of the valleys (Rubat Borel et al., 2015).

The orographic left side of the first valley, with most of the lithic artefacts found during the preliminary campaign, has been subjected to intense survey activities. Samplings have been carried out in correspondence to erratic boulders, on the top of hills with a wide view over the surrounding territory, next to the main paths with boulders giving a natural protection against the main wind direction. Fourteen samplings have been done, among which, one (TL 134), produced a quartz flake. TL 134 is located a few meters from TL09 where three quartz flakes were found in 2013.

The right orographic side of the valley going from Alpe Piovale to the Bo lakes is characterized by steep slopes, landslides and wide wet areas, thus appearing as an unsuitable area for research. For this reason, in this area just eleven samplings were carried out, in correspondence to hillocks and rock-shelters, but, as expected, no evidence of prehistoric human frequentations was identified.

Even the area of the Bo lakes was investigated during this campaign. Samplings involved the area close to the lakes, a small rock-shelter and the surrounding hillocks. The survey activity identified a large primary quartz outcrop (TL 207), but no evidence of prehistoric frequentation was found.

Starting from the study of the geological cartography available, two new areas have been identified as potentially interesting for research: Tegge dell'Artignaga (1406 m a.s.l.) (Fig. 6), and Campo di Quara (1476 m a.s.l.). These two plateaus are wide flat grasslands, characterized by a good view of the surrounding territory and by the presence of water sources. Samplings have been carried out at Tegge dell'Artignaga next to erratic boulders and all along the ridge path from Tegge dell'Artignaga di sotto (1374 m a.s.l.) to Tegge dell'Artignaga di sopra (1614 m a.s.l.), but no lithic industries have been found. Campo di Quara gave no sign of prehistoric human frequentation, as the locality is characterized by the presence of a wide wet area. For this reason, only four samplings were done in this place, three in raised areas and one next to an erratic boulder.

The best results of this second survey campaign come from the exploration and the sampling of the ridge path from Bocchetto Sessera (1373 m a.s.l.) to Colma Bella (1678 m a.s.l.) (Fig. 7). Two quartz flakes were found during the survey activities where the turf was lifted by the passage of wild boars. The flakes are complete and one showed two negatives of previous removals on the upper face (Fig. 10) but there are no diagnostic elements allowing a precise chronological attribution of these artefacts. As for the lithic industries found during the previous campaign, the technological analysis suggest short *châine operatoires* with a mainly opportunistic exploitation of the cores for the production of small flakes with at least one cutting edge.

Sampling CR 19 was carried out along the ridge path, near the so called "*Pera Forà*" (1642 m a.s.l.), a rocky ridge composed by blocks of syenite that through erosive action developed its characteristic arch shape (Fig. 11). In the 50 × 50 $cm^2$ sample were found three fragments of Late Ancient pottery. The sample was then extended to 150 × 50 $cm^2$ for a depth of 20 cm, leading to the discovery of several other fragmented potteries and of two incomplete iron artefacts (a nail and a barb), thus allowing to identify a historical human frequentation. The sixty potsherds found, some of tiny size, are attributable to the production of common pottery, raw and uncoated, baked in a mainly reducing, or not uniform, atmosphere. Three fragmented rims are the only diagnostic elements. The first one, not graphically reconstructable, is a fragment of a triangular-section rim with a pronounced groove for the housing of a top. The second one is attributable to an olla with a sub-triangular-section banded rim, the beige ceramic body is porous and rich in impurities (mainly quartz and golden mica) and *chamotte*. The third diagnostic fragment is attributable to an olla characterized by a triangular-section rim, long neck and shoulder marked by a soft groove (Fig. 12). In spite of the limited data available, it is possible to confirm a Late Ancient (IV – VI century A.D.) human frequentation of the site, even if the modalities of this frequentation are still unknown. The analysis of the four charcoals found in CR 19 led to the identification of the two taxa *Acer* and *Ulmus*.

## 5. Discussion

The Piedmontese region and, in wider terms, the area of the western Alps, have always been poorly investigated concerning their prehistoric, and especially Palaeolithic and Mesolithic, peopling. Particularly concerning the frequentation of high and medium altitude territories, the only data available for a careful consideration of the data collected come from a very few sites (Gambari et al., 1989; Forno et al., 2013). Another peculiarity of this area is the widespread and intense use, from the Middle Palaeolithic (Arzarello et al., 2012; Daffara et al., 2014), of local raw materials like vein or hyaline quartz as the main raw materials for the production of lithic tools. Concerning the high-altitude human frequentation, the best examples are the Mesolithic sites of Alpe Veglia (northern Piedmont – 1750 m a.s.l.) (Gambari et al., 1989) and Monte Fallère (Aosta valley – 2300 m a.s.l.) (Forno et al., 2013) which are the only high-altitude sites systematically investigated in recent years. In the Alpe Veglia site, the archaeological excavation carried out in 1988 led to the recovery of an ancient Mesolithic lithic industry mainly made of local hyaline quartz. Similarly, the systematic excavations recently carried out at Monte Fallère led to the identification of a Mesolithic site characterized by the presence of a lithic industry made of local hyaline quartz. Also, some chance discoveries in the Piedmontese territory confirm the large employment of local vein quartz for the production of lithic tools

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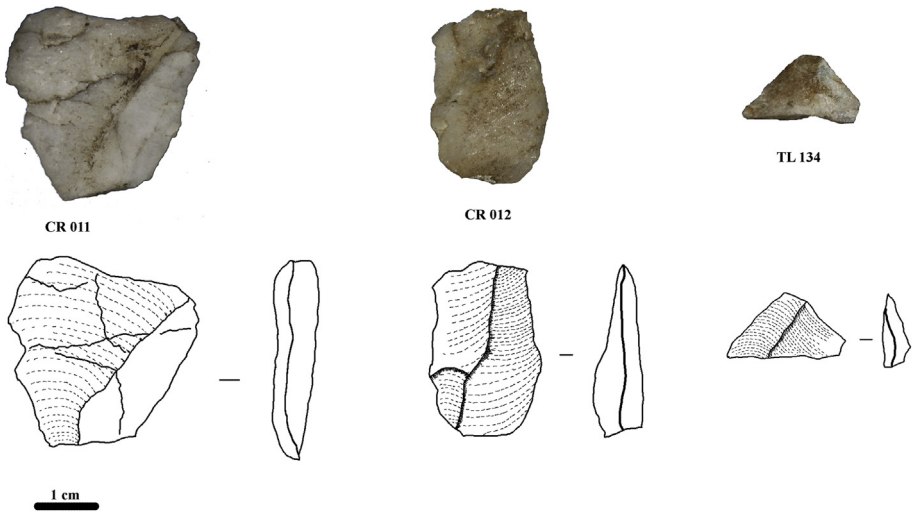


**Fig. 10.** Vein quartz lithic industries found during the 2014 survey in the high Sessera valley. CR 011 and CR 012: complete flakes from the ridge path connecting Bocchetto Sessera (1373 m a.s.l.) to Colma Bella (1678 m a.s.l); TL 134: distal fragment found in the valley going from Alpe Isolà to the Bo lakes.

**Fig. 11.** Rocky ridge composed by blocks of syenite and known as Pera Forà (1642 m a.s.l.). From the sampling CR 019, located nearby the rock ridge, come sixty potsherd and two fragmented iron artefacts attesting a Late Ancient human frequentation of the site (IV – VI century A.D.).

(Berruti and Daffara, in press). Unlike other Italian regions, vein quartz is the most employed raw material during the whole prehistory of Piedmont despite its limited aptitude for knapping, as it tends to fracture following the surfaces of the macro or microcrystals that form its inner structure (Mourre, 1996; De Lombera-Hermida, 2009; De Lombera-Hermida et al., 2011) thus leading to lithic tools characterized by rough surfaces and by the rapid loss of their technological characteristics (Arzarello et al., 2011). The large use of such mediocre raw material can be easily explained with the almost complete absence of good quality raw materials outcrops in all the Piedmontese territory. Vein quartz, in contrast, is widespread and easily accessible at high-altitude. The lack of systematic research on the territory together with the not easy recognition of the vein quartz lithic industries due to the inner structure and to the mechanical characteristics of vein quartz (De Lombera-Hermida, 2009; De Lombera-Hermida et al., 2011), are, in our opinion, the main causes for the poor knowledge of the Prehistoric human peopling of the region.

In such a patchy framework, it is easy to understand the importance of the results obtained during the two survey campaigns in the high Sessera valley. The identification of knapped lithic industries made of local vein quartz represents a further step in the reconstruction of the high-altitude prehistoric human frequentation in Piedmont and, nowadays, they are the only evidence of a high-altitude prehistoric human presence in north-eastern Piedmont.

Concerning the Late Ancient site of *Pera Forà*, the typological analysis of the potsherds place them within the local productions typical of the period. The triangular-section rim is attributable to ollas, very common in the neighbouring area of Vercelli during the V-VI century A.D. (Botalla, 2013). The second rim is referable to potteries well attested in north-eastern Piedmont and in western Lombardy, produced from the IV century A.D., but their greater diffusion is dated between the V and VI century A.D. both in urban and in rural contexts (Pantò, 2002). Similar potteries come from the VI century A.D. frequentation of the Ciota Ciara cave, located on the west side of Fenera mount, in correspondence to the junction between the Sessera and the Sesia valley (Brecciaroli Taborelli, 1995). The third rim belongs to a kind of pottery whose production started in the late III century A.D., as attested by the ones found in some necropolis of the region, such as Biella (Preacco Ancona, 2000) and Borgosesia (Brecciaroli Taborelli, 1995). Comparable potteries come

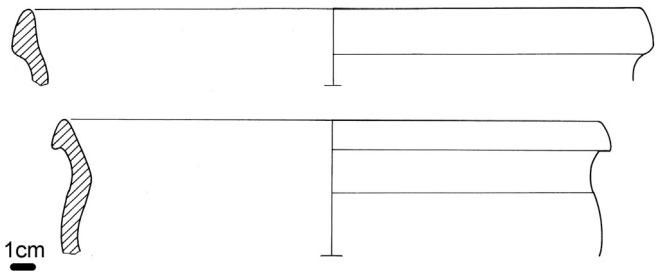


**Fig. 12.** Drawings of the two diagnostic rims found in the sampling CR 019. On the top: olla with a sub-triangular-section band rim referable to potteries well attested in north-eastern Piedmont and in western Lombardy from the IV century A.D. and with a greater diffusion between V and VI century A.D. both in urban and in rural contexts. On the bottom: olla characterized by a triangular-section rim, long neck and shoulder marked by a soft groove belonging to a kind of pottery whose production started in Piedmont in the late III century A.D.

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also from several Piedmotese urban contexts dated between III and VI century A.D., e.g. Alba (Quercia, 1997), Vercelli (Vaschetti, 1996), Lu Monferrato (Martignetti and Vaschetti, 2004), Trino Vercellese (Pistan, 1999) and Lenta (Pantò, 2002). As this typology is widely attested in the area from the late III to the VII century A.D. (Vaschetti, 1996), without a stratigraphic context it is very difficult to propose a more precise chronological position for the potteries found during the survey.

## 6. Conclusions and research perspectives

The results obtained during the first two survey campaigns in the high Sessera valley show that the area was occupied by human groups, linked to the exploitation of lithic raw materials for the production of tools. Chronologically, these frequentations should be placed after the retreat of the glacier, which occurred in this area about 11000 BP (Biasetti, 2007). Unfortunately, the lithic industries found have no diagnostic elements useful to propose a more precise chronological assessment. Besides the small number of lithic artefacts found, the problem of the chronology of these human frequentations is also due to the scarce data available about the prehistoric human presence at high altitude in the Piedmont. On one side, this is due to the lack of systematic research, and, on the other side, to the actual complexity in recognizing vein quartz lithic industries. Especially in territories like the high Sessera valley where vein quartz is abundantly present in primary and secondary outcrops, the identification of the lithic industries among the great number of geofacts is very hard. As already highlighted by Broglio and Lunz (1984), another problem is that the raw material employed strongly affects the characteristics of a lithic industry: quartz lithic industries show great differences compared to flint lithic industries concerning shape, dimensions and frequency of retouched tools within the lithic assemblage. As the lithic industry found in the high Sessera valley is the first high-altitude vein quartz lithic assemblage found in Piedmont, only the progression of the research could give an answer to the problem of the chronological collocation of the prehistoric human presence in this territory. At the moment, the techno-typological study of the lithic industries does not allow to confirm or to exclude their Mesolithic attribution. New campaigns will complete the survey of the valley, paying particular attention to the ridge paths, still poorly investigated but showing great potential for the aims of the research.

Concerning the Late Ancient site of *Pera Forà*, the altitude (1642 m a.s.l.) probably indicates a seasonal frequentation of the site, maybe during transhumance, while the presence of a rock shelter and charcoals of *Acer* and *Ulmus* support the hypothesis of a temporary camp with storage of foodstuffs. The high number of potsherds found in the limited area of the sampling is evidence of a repeated human frequentation in the area of the *Pera Forà*. A systematic excavation of the area will be carried out in the next years, thus better defining modalities and characteristics of this frequentation.

In conclusion, it is possible to state that the high Sessera valley shows a great potentiality for the research of prehistoric human frequentation at high altitude. The method employed during the survey campaigns (Broglio and Improta, 1995; Kompatscher and Kompatscher, 2007), developed and extensively employed in the eastern Alps with excellent results, can be profitably employed in other geographical contexts. The last interesting consideration that can be done looking at the results obtained, is that this method is useful for the research of any kind of human frequentation at high altitude, since in these areas the ridge paths and, generically, the communication routes did not undergo substantial changes during the last thousands of years.

The final aim of the project, to be pursued through further and wider research, is to define the modalities and the dynamics of the prehistoric human presence in the Sessera valley, similarly to what has been done in the eastern Alps during the last thirty years (Broglio, 1994; Broglio and Lanzinger, 1996; Dalmeri and Lanzinger, 1998; Dalmeri et al., 2004; Angelucci and Bassetti, 2009). Concerning the historic frequentation, the data obtained will complete the work done by DocBi (VV.AA, 1997, 2002), thus coming to the reconstruction of the whole history of the human presence in the high Sessera valley.

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