



## Article

# The Mesolithic occupation at Isolidda (San Vito Lo Capo), Sicily

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## Key words

- Sicily
- Mesolithic
- lithic assemblages
- coastal resource exploitation

## Parole chiave

- Sicilia
- Mesolitico
- industrie litiche
- sfruttamento delle risorse marine

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## Summary

‘Gruppo dell’Isolidda’ is a complex of five caves along a rocky cliff on the eastern side of the promontory of San Vito Lo Capo in NW Sicily. In 2004 archaeological excavations in the slope below the caves revealed a stratified deposit, partially in secondary position, containing levels with Late Epigravettian and Mesolithic stone tool assemblages. Early Mesolithic assemblages, characterized by backed microliths, were distributed in two contiguous layers (SU 21 and SU 25), the lowest of which (SU 21) also contained Epigravettian tools, probably due to sediment reworking. Three AMS dates on *Phorcus turbinatus* shells (~9520-9000 cal. BP) are chronologically compatible with the Early Mesolithic materials and suggest that the bulk of the deposit accumulated then. A third level, lying above the previous ones, contained artefacts associated to the Late Mesolithic or Early Neolithic. Faunal remains included abundant shells of intertidal molluscs, along with few fragmented bones of terrestrial herbivores. Oxygen isotope analyses on shell carbonates of *Phorcus turbinatus* show that, around 9520-9000 cal. BP, marine molluscs were exploited year-round, albeit more often in autumn and winter.

## Riassunto

Il “Gruppo dell’Isolidda” è un complesso di cinque cavità che si aprono lungo il versante orientale del promontorio di San Vito Lo Capo (Trapani). Nel 2004 un sondaggio praticato nel pendio che si estende davanti alle grotte, ha messo in luce un deposito pluristratificato, parzialmente in giacitura secondaria, con livelli riferibili all’Epigravettiano finale, al Mesolitico e probabilmente al Neolitico antico. Le industrie del Mesolitico antico, caratterizzate da armature ipermicrolitiche, sono distribuite in due strati sovrapposti (SU 21 e 25); in quello più antico (SU 21) si registra una commistione con elementi epigravettiani, probabilmente frutto di un rimaneggiamento in antico. Un terzo livello, soprastante ai precedenti, potrebbe essere riferibile ad un aspetto mesolitico a trapezi o al Neolitico antico. Le faune sono rappresentate soprattutto da abbondanti resti di molluschi marini mentre sono molto scarsi i resti di erbivori. Le analisi isotopiche effettuate su conchiglie di *Phorcus turbinatus*, dimostrano che, intorno a 9520-9000 cal. BP, la raccolta dei molluschi marini avveniva durante tutto l’anno, ma soprattutto in autunno ed in inverno.

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## The site and its setting

'Gruppo dell'Isolidda' is a complex of five caves that opens 70-60 m above sea level along a coastal rocky cliff on the eastern side of the promontory of San Vito Lo Capo (Trapani) (Fig. 1).

The caves were probably all part of a single larger cave, which is now partially collapsed.

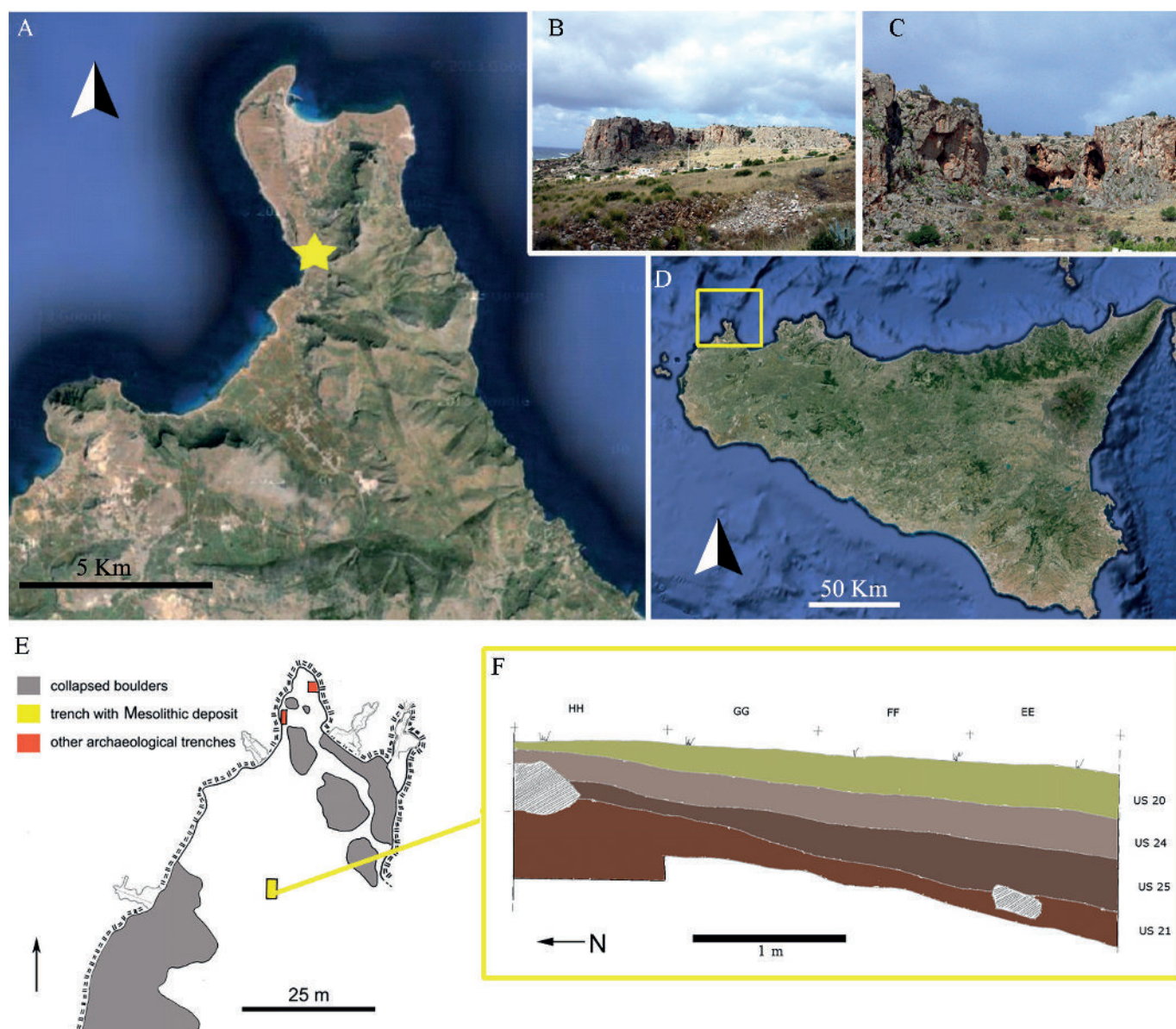
The first archaeological investigations at this site took place in the 1920s, when Raymond Vaufray found Upper Palaeolithic industries at Grotta Racchio (Vaufray 1928), the easternmost of the five caves. In the early 1960s, Giovanni Mannino discovered rock art in this same cave (Mannino 1962).

In 2004 a research team from the University of Florence, in partnership with the Museo e Istituto Fiorentino di Preistoria, undertook multidisciplinary investigations at the site (Martini *et al.* 2012a; Baglioni *et al.* 2012). Three trenches were opened to verify the presence of archaeological deposits.

A trench of around 8 square metres, excavated on the slope

below the cave complex, revealed a stratified deposit under the modern topsoil (SU 20), partly in secondary position, consisting of three main stratigraphic units (SU 24, 25 and 21), each excavated in artificial spits of about five centimeters (Fig. 1, E-F). No structures or evident paleosurfaces were detected, as it is likely that the stratigraphic sequence accumulated following distinct colluvial episodes, which transported sediments from just outside the caves further downslope. Despite these formation processes, the deposits have distinguishable levels and constitute a rather coherent sequence. This can be explained by hypothesizing that the colluvial events were chronologically discrete and that colluviation down the slope occurred soon after their primary deposition.

The archaeological sequence contained stone tool industries dating back to the Late Pleistocene (Late Epigravettian) and Early Holocene (Mesolithic and Early Neolithic) (Tab. 1). The lowermost levels (SU21-spits 17 lower, 18 and 19) contained only Epigravettian industries, while the levels above them (SU21-spits 17 and 16, SU25 spit 16 upper) contained a mixture of Upper Palaeolithic and Early Mesolithic industries. SU25- spit 15 contained the bulk of the Early



**Fig. 1** - Gruppo dell'Isolidda. A-D- the site and its location; E- plan of the site and position of trench n. 2 excavated on the slope below the caves; F- stratigraphic sequence drawn from the section east of trench n. 2. / A-D- il sito; E- pianta del sito e posizione della trincea 2 aperta sul pendio sottostante le cavit ; F- sequenza stratigrafica della sezione est della trincea 2

**Tab. 1** - Gruppo dell'Isolidda. Stratigraphic scheme and chrono-cultural sequence. The radiocarbon dates were calibrated with the OxCal 4.2 software (Bronk Ramsey & Lee 2013), using the Marine13 curve (Reimer et al. 2013). The reservoir correction of the calibrated ages is based on the estimate of the reservoir effect by Siani et al. (2000) for Sicily ( $\Delta R = 71 \pm 50$   $^{14}\text{C}$  yrs). / Schema stratigrafico e sequenza crono-culturale. Le date radiometriche sono state calibrate con il software OxCal 4.2 (Bronk Ramsey & Lee 2013), usando la curva Marine13 (Reimer et al. 2013). La correzione dell'effetto reservoir delle date calibrate è basata sulla stima del "reservoir effect" elaborata da Siani et al. (2000) per la Sicilia ( $\Delta R = 71 \pm 50$   $^{14}\text{C}$  yrs).

| LAYER | SPIT      | MAIN DIAGNOSTIC ARTEFACTS AND SUBSISTENCE REMAINS | CULTURAL ATTRIBUTION OF STONE TOOL INDUSTRIES                               | AMS CHRONOLOGY ( $^{14}\text{C}$ BP)                                |
|-------|-----------|---------------------------------------------------|-----------------------------------------------------------------------------|---------------------------------------------------------------------|
| SU 24 | 14        | Ipermicro and micro trapezes                      | Late Mesolithic or Early Neolithic                                          | -                                                                   |
|       |           | Very few obsidian flakes                          |                                                                             |                                                                     |
|       |           | Very few indeterminable pottery sherds            |                                                                             |                                                                     |
| SU 25 | 15 upper  | Few marine mollusc shells                         | Early Mesolithic with intrusive Late Mesolithic or Early Neolithic elements | -                                                                   |
|       |           | Few ipermicro and micro lithic armatures          |                                                                             |                                                                     |
|       |           | Two ipermicro trapezes                            |                                                                             |                                                                     |
|       |           | Very few obsidian flakes                          |                                                                             |                                                                     |
| SU 25 | 15 lower  | Marine mollusc shells                             | Early Mesolithic                                                            | (OxA-18069)<br>8685 $\pm$ 40<br>(9430-9080 yrs cal BP; 2 $\sigma$ ) |
|       |           | Ipermicro and micro lithic armatures              |                                                                             |                                                                     |
|       |           | Small centripetal and facial cores                |                                                                             |                                                                     |
|       |           | Marine mollusc shells                             |                                                                             |                                                                     |
| SU 25 | 16 upper  | Rare terrestrial mammal remains                   | Late Epigravettian and<br>Early Mesolithic                                  | (OxA-18070)<br>8620 $\pm$ 45<br>(9380-9000 yrs cal BP; 2 $\sigma$ ) |
|       |           | Ipermicro and micro lithic armatures              |                                                                             |                                                                     |
|       |           | Small centripetal and facial cores                |                                                                             |                                                                     |
|       |           | Upper Palaeolithic stone elements                 |                                                                             |                                                                     |
|       |           | Abundant marine mollusc shells                    |                                                                             |                                                                     |
|       |           | Engraved <i>Columbella rustica</i> shell          |                                                                             |                                                                     |
| SU 21 | 16 lower  | Rare terrestrial mammal remains                   | Late Epigravettian and<br>Early Mesolithic                                  | -                                                                   |
|       |           | Ipermicro and micro lithic armatures              |                                                                             |                                                                     |
|       |           | Small centripetal and facial cores                |                                                                             |                                                                     |
|       |           | Upper Palaeolithic stone tools and cores          |                                                                             |                                                                     |
|       |           | Marine mollusc shells                             |                                                                             |                                                                     |
| SU 21 | 17 upper  | Rare terrestrial mammal remains                   | Late Epigravettian and<br>Early Mesolithic                                  | (OxA-18071)<br>8785 $\pm$ 45<br>(9520-9220 yrs cal BP; 2 $\sigma$ ) |
|       |           | Upper Palaeolithic stone tools and cores          |                                                                             |                                                                     |
|       |           | Some Mesolithic stone elements                    |                                                                             |                                                                     |
|       |           | Marine mollusc shells                             |                                                                             |                                                                     |
|       |           | Few terrestrial mammal remains                    |                                                                             |                                                                     |
| SU 21 | 17 lower  | Upper Palaeolithic stone industry                 | Late Epigravettian                                                          | -                                                                   |
|       |           | Few marine mollusc shells                         |                                                                             |                                                                     |
| SU 21 | 18 and 19 | Upper Palaeolithic stone industry                 | Late Epigravettian                                                          | -                                                                   |

Mesolithic stone tools found in the archaeological deposit; SU25-spit 15 lower yielded exclusively Early Mesolithic industries, while in the level above it (SU25-spit 15 upper) two trapezes and a rare intrusive obsidian flakes were recovered, probably coming from the overlying layer (SU 24). SU 24 was characterized by the occurrence of trapezes dating back to the Late Mesolithic or Early Neolithic.

## AMS radiocarbon dating

AMS radiocarbon dating was undertaken at the Oxford Radiocarbon Accelerator Unit on three shells of the marine mollusc *Phorcus turbinatus* from the two lowermost stratigraphic units. The dates all fall within the Early Holocene and are consistent with the archaeological stratigraphy and the Early Mesolithic stone tool assemblages. The calibrated ages of the dates on the shells from SU 21-spit 17 upper (OxA-18071), SU 25-spit 16 upper (OxA-18070) and SU 25-spit 15 lower (OxA-18069) overlap and suggest that the bulk of the deposit accumulated during the Mesolithic (~9520-9000 yrs cal. BP) (Tab. 1)

## Mesolithic stone tool assemblages

The archaeological deposit of trench 2 contained over 7000 lithic items, including almost 1200 retouched tools and 100 cores, attributable to the period spanning from the Late Epigravettian to the Early Neolithic. As mentioned above (see section 1 and Tab. 1), with the exception of the lowest spits of SU21 (spits 19-18 and 17 lower), Mesolithic lithics have been found throughout the archaeological sequence, often mixed with finds of other periods. The retouched lithic tools and cores that can be ascribed almost exclusively to the Early Mesolithic are those from SU25-spit 15, although this assemblage also contains a few intrusive artefacts from the layer above (spit 15 upper).

Of the whole stone tool assemblage recovered at Isolidda, only the Mesolithic finds will be discussed here, in our account of the main techno-typological features of the assemblage and of the most significant lithic artefacts.

The Mesolithic stone tool assemblages (Fig. 2) are made on good quality flint, locally collected mainly in secondary deposits (sho-

res and riverbeds), in the form of pebbles and cobbles (Collina 2006 and 2012).

In SU 21-spits 17 upper and 16 lower (Fig. 2, E and D) and SU 25-spits 16 upper and 15 lower (Fig 2, C and B) an intensive exploitation of cores, through both facial (unidirectional and bidirectional) and centripetal reduction schemes, attests a production aimed at obtaining ipermicro (up to 15mm)- and micro (16-25mm)-blanks (bladelets, laminar flakes, flakes) for making armatures. In these levels, among the retouched artefacts, unilateral backed points (some of which are curved) and short triangles, are present. These items might be assignable to one of the local Mesolithic facies defined as "Epigravettian-tradition facies" (Lo Vetro & Martini 2012 and 2016). Several artefacts are also compatible with the local Sauveterrian-like facies, such as: an ipermicro double-baked point, ipermicro short triangular backed points, "tectiform" (roof-shaped) end-scrapers, and very small facial and centripetal cores. These items are comparable with those from Perriere Sottano (Aranguren & Revedin 1998) and Grotta d'Oriente (Martini *et al.* 2012b). A nosed end-scraper with two lateral notches from SU 25-spit 16 upper (Fig. 2, n. 25) is comparable to the items from the Early Mesolithic levels of Grotta dell'Uzzo (Piperno 1985; Guerreschi & Fontana 2012).

SU 24 (Fig. 2, A) yielded a dozen of ipermicro trapezes, some of which made on very regular pressure flaking bladelets, comparable to the Late Mesolithic (Castelnovian) and Early Neolithic items from Grotta dell'Uzzo (Collina 2012). Pressure flaking is also attested by the occurrence of few symmetric and thin bladelets among which there are some microburins.

## Mesolithic subsistence strategies and seasonality of mollusc exploitation

Subsistence strategies at the site involved the exploitation of large mammals and intertidal molluscs. Large mammal exploitation was mainly oriented towards *Cervus elaphus* and *Sus scrofa*. Intertidal molluscs were collected on nearby rocky shores and are mainly represented by *Phorcus turbinatus* and different species of Patellidae. A peak in the minimum number of individuals (MNI) is observed in SU 25, although intertidal molluscs occur throughout the sequence, with no substantial changes in species composition (Shannon index) (Fig. 3).

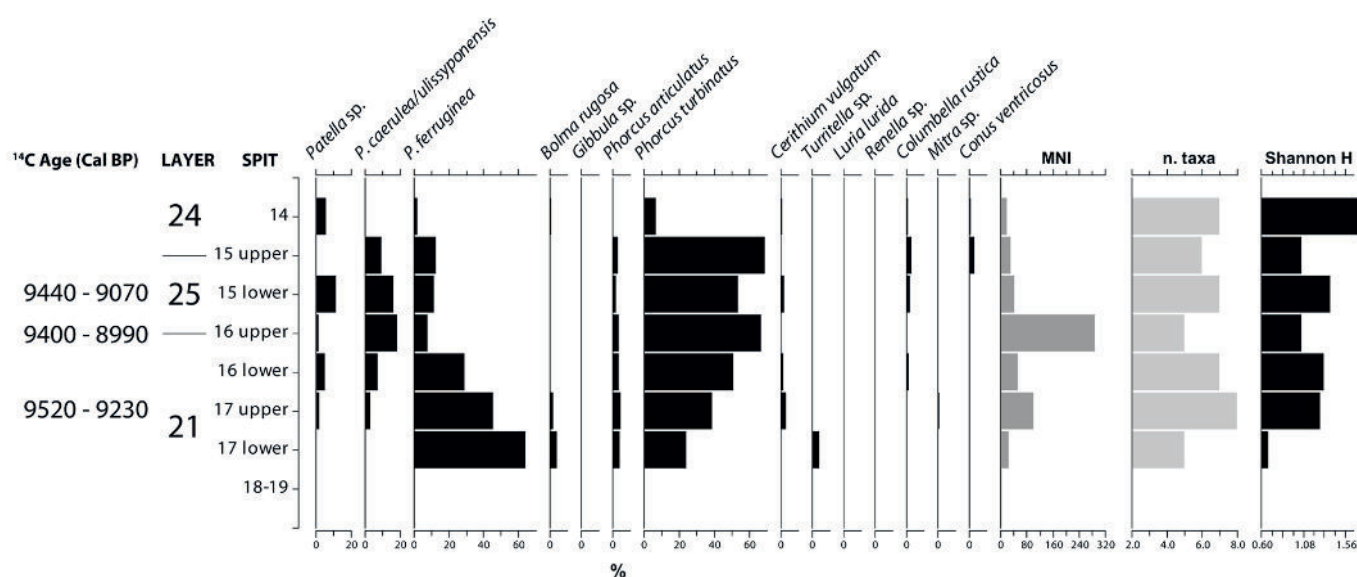
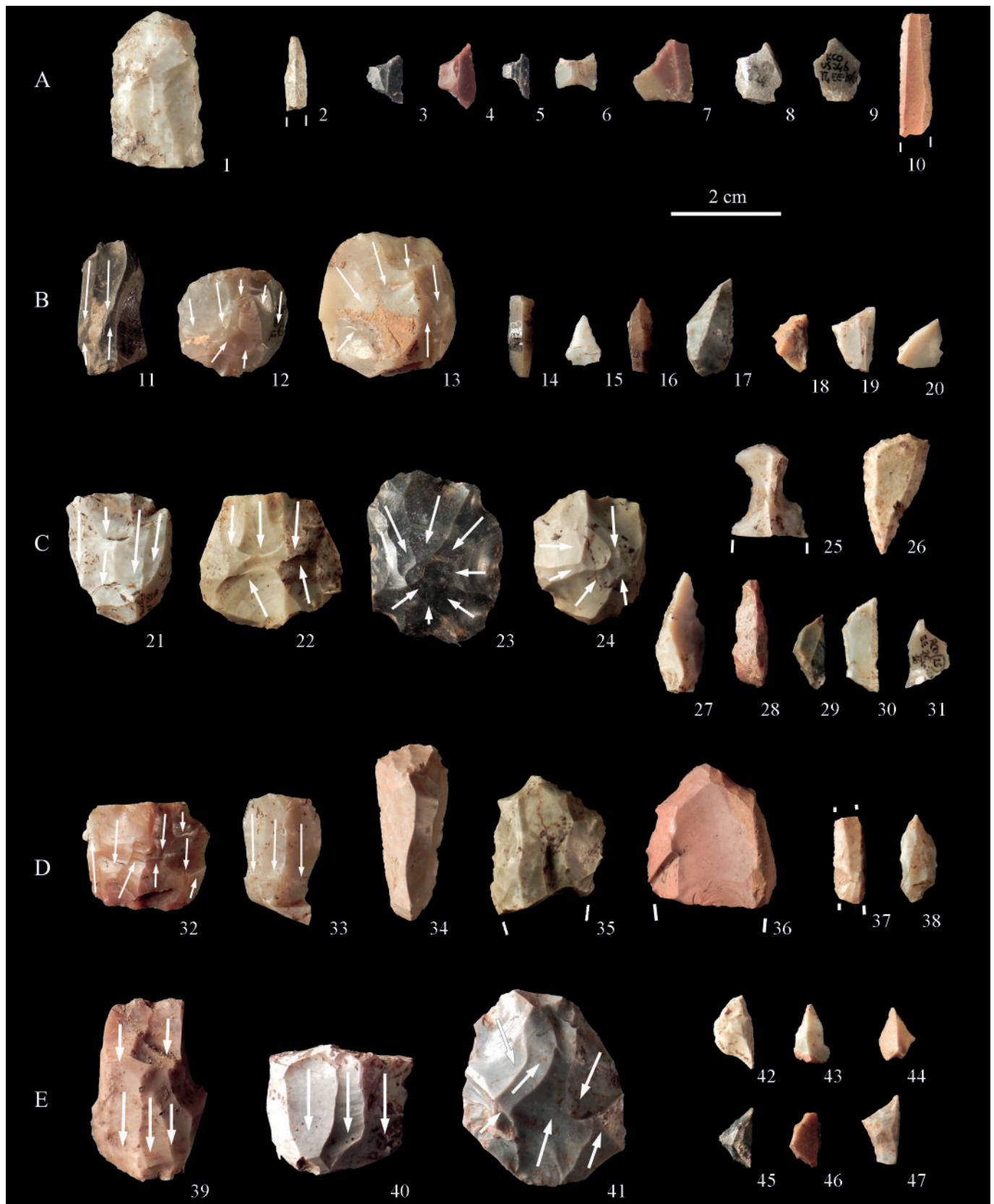


Fig. 3 - Gruppo dell'Isolidda. Trench 2. Marine molluscs. The minimum numbers of individuals (MNI), the number of taxa and the Shannon index are also reported on the right. / Trincea 2. Molluschi marini. Sulla parte destra dell'istogramma sono riportati il numero minimo degli individui, (MNI), il numero dei taxa e l'indice Shannon.





**Fig. 2** - Gruppo dell'Isoldda. Mesolithic stone artefacts from trench 2. A: from SU 24, 1- tectiform (roof-shaped) long end-scraper, 2- backed point, 3-7- trapezes, 8-9- microburins, 10- pressure knapped bladelet; B: from SU 25-spit 15 lower, 11- facial reduction method core, 12-13- centripetal reduction method cores, 14- truncated bladelet, 15-17- backed points, 18-20- triangles; C: from SU 25-spit 16 upper, 21-22- facial reduction method cores, 23-24- centripetal reduction method cores, 25- long end-scraper, nosed end-scraper, 27-28- backed points, 29- triangle, 30- trapeze, 31- microburin; D: from SU 21-spit 16 lower, 32-33- facial reduction method cores, 34- long end-scraper, 35-36- tectiform (roof-shaped) end-scrapers, 37- backed point, 38- fragment of backed tool; E: from SU 21-spit 17 upper, 39-40- facial reduction method cores, 41- centripetal reduction method core, 42-44- backed points, 45-47- triangles (photo D. Lo Vetro). / Manufatti litici mesolitici dalla trincea 2. A: da US 24, 1- grattatoio frontale lungo, 2- punta a dorso, 3-7- trapezi, 8-9- microbulini, 10- lamella a pressione; B: da US 25-taglio 15 inferiore, 11- nucleo a sfruttamento frontale, 12-13- nuclei a sfruttamento centripeto, 14- troncatura, 15-17- punte a dorso, 18-20- triangoli; C: da US 25-taglio 16 superiore, 21-22- nuclei a sfruttamento frontale, 23-24- nuclei a sfruttamento centripeto, 25- grattatoio frontale lungo, grattatoio a muso evidenziato, 27-28- punta a dorso, 29- triangolo, 30- trapezio, 31- microbulino; D: da US 21-taglio 16 inferiore, 32-33- nuclei a sfruttamento frontale, 34- grattatoio frontale lungo, 35-36- grattatoi frontali tettiformi, 37- punta a dorso, 38- frammento di dorso; E: da US 21-taglio 17 superiore, 39-40- nuclei a sfruttamento frontale, 41- nucleo a sfruttamento centripeto, 42-44- punte a dorso, 45-47- triangoli (foto D. Lo Vetro).

Shells of *Patella ferruginea* dominated the marine mollusc remains in SU 21 (Fig. 4), which is associated with lithic assemblages typical of the Late Epigravettian and Early Mesolithic. It is also worth noting that this species underwent a substantial decrease in size from SU 21 ( $60.6 \pm 5.3$  mm) to SU 25 ( $46.6 \pm 10$  mm). As *P. ferruginea* living in protected areas today ( $51.9 \pm 1.9$  mm) are larger than those recovered in SU 25, it can be hypothesized that during the Early Holocene this species was subject to either environmental changes or anthropogenic pressures. *Phorcus turbinatus* was the most intensively collected species during the accumulation of SU 25. Most of the shells are partially broken or had their apex removed likely for the extraction of the molluscan flesh.

#### Oxygen isotope analyses

To investigate the seasonality of site occupation, we undertook oxygen isotope analyses on 28 shells of the intertidal gastropod *Phorcus turbinatus* according to established methodologies (Mannino *et al.* 2007, 2008; Colonese *et al.* 2009). Molluscs were exploited in every season, but mainly in autumn and winter, with few summer

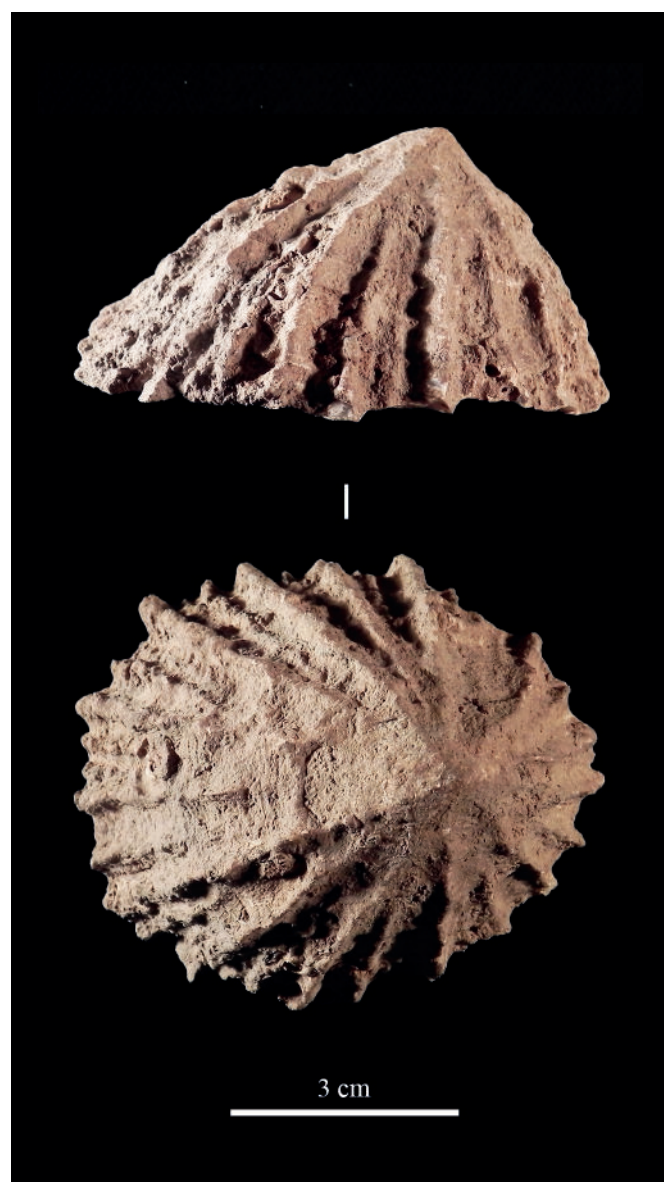
and rare spring collections. This suggests that hunter-gatherers were at the site regularly, although with the evidence at hand it is hard to establish whether this was a result of frequent short visits or more prolonged year-round occupation (Fig. 5).

### Modified marine shells: personal ornaments

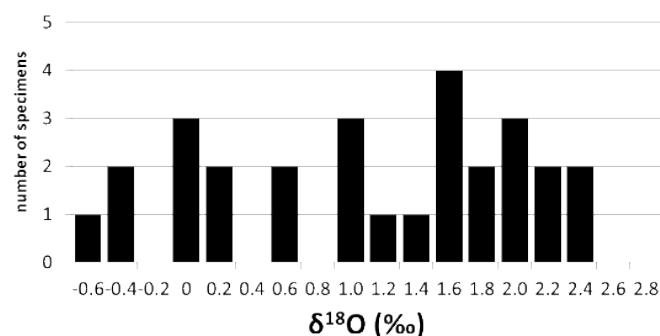
Marine shells were modified and likely used as personal ornaments by the occupants of the site, as attested by perforated shells of *Columbella rustica* retrieved mainly from SU 25 (spits 15 and 16), and SU 24. One shell of *Columbella rustica* (SU 25-spit 16 upper) had several parallel incisions on the body whorl (Fig. 6; Martini *et al.* 2012a). Use-wear traces suggest that this shell was suspended or attached to clothing. This is a remarkable find since it bears very similar ornamentations to worked shells of *Columbella rustica* from other Mesolithic sites in Sicily: Grotta dell'Uzzo (two specimens, Tagliacozzo 1993), Perriere Sottano (one specimen, Aranguren & Revedin 1998) and Grotta d'Oriente (one specimen, Cilli *et al.* 2012). The latter shell is associated either to the Late Mesolithic of Castelnovian tradition or to the Early Neolithic (Martini *et al.* 2012b). Taken together, this evidence suggests that there was an established shell ornament tradition shared by Mesolithic groups living across Sicily.

### Conclusions

The site of Isolidda was occupied from the end of the Upper Palaeolithic to the Early Neolithic, similarly to many cave sites in NW Sicily. However, the main occupation phase coincided with the Early Mesolithic (upper spits of SU 21 and SU 25) when hunter-gatherers exploited terrestrial mammals and marine molluscs, the latter also for ornamental purposes. In these levels, although Mesolithic and Late Epigravettian lithic artefacts are partly mixed, due to site for-



**Fig. 4** - Gruppo dell'Isolidda. Trench 2. *Patella ferruginea* from SU 21-spit 17 upper. / Trincea 2. *Patella ferruginea* da SU 21-taglio 17 superiore.



**Fig. 5** - Gruppo dell'Isolidda. Trench 2. Oxygen isotope values of edge samples drilled from 28 shells of *Phorcus turbinatus* recovered in SU 21-spit 17 upper, SU 25-spit 16 upper and SU 25-spit 15 lower. The x-axis represents the overall yearly oxygen isotope range recorded on specimens from the site of Isolidda, with the highest values corresponding to the coldest temperatures and the lowest values to the warmest. Intervals in the x-axis are equivalent to around 1.0°C in sea surface temperature ( $\delta^{18}\text{O} = 0.23\text{‰}$ ). / Trincea 2. Valori degli isotopi dell'ossigeno dai campioni prelevati al bordo di crescita di 28 conchiglie di *Phorcus turbinatus* rinvenute nelle US 21-taglio 17 superiore, US 25-taglio 16 superiore ed US 25-taglio 15 inferiore. Sull'asse delle ascisse è rappresentato il range annuale dei valori degli isotopi dell'ossigeno registrato su alcuni esemplari dell'Isolidda, con i valori isotopici più elevati corrispondenti alle temperature dell'acqua del mare più basse e quelli più bassi alle temperature più alte. Gli intervalli riportati sull'asse delle ascisse corrispondono a circa 1.0°C nella temperatura di superficie dell'acqua del mare ( $\delta^{18}\text{O} = 0.23\text{‰}$ ).



**Fig. 6** - Gruppo dell'Isolidda. Trench 2. Shell of *Columbella rustica* with several parallel incisions on the body whorl (after Martini, et al. 2012a). / Trincea 2. *Columbella rustica* con incisioni parallele (da Martini et al. 2012a).

mation processes, it is possible to recognize stone tool assemblages showing techno-typological features comparable to those from other Early Mesolithic Sicilian sites. Some items might be referred to the local Sauveterrian-like facies, others to the so-called "Epigravettian-tradition facies". A more recent phase is attested in SU 24, in which some elements (trapezes, pressure flaking bladelets) may be referred to a Late Mesolithic (Castelnovian) or Early Neolithic occupation.

The Mesolithic occupants of Isolidda were culturally very close to groups living across Sicily in the early Holocene, as testified by their lithic industries and worked shells, which imply common symbolic repertoires.

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