

## New Radiocarbon dates for Algarão da Goldra (Faro, Portugal): a contribution to the Neolithic of the Algarve

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### Abstract:

Test excavations at Algarão da Goldra in 1987 revealed an important Middle Neolithic layer with abundant material culture and subsistence evidence crucial for the understanding of this period in the Algarve. New radiocarbon determinations on human remains provide more precise dating to the 4500-4000 cal BC interval, allowing the establishment of comparisons of Goldra's rich archaeological record with other Neolithic sites in the region and its relation with the onset of the megalithic phenomenon.

### Resumo:

Trabalhos de sondagem no Algarão da Goldra em 1987 revelaram um importante contexto do Neolítico médio com abundantes dados no que respeita a cultura material e economia de subsistência, cruciais para o conhecimento deste período no Algarve. Datações de radiocarbono sobre restos humanos apontam para o intervalo de tempo compreendido entre 4500 e 4000 cal BC, permitindo assim o estabelecimento de comparações do seu rico registo arqueológico com outros sítios neolíticos da região e a sua relação com a emergência do fenómeno megalítico.

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## INTRODUCTION

Algarão da Goldra is a karstic cavity located close to the eastern summit of a 288-metre hill locally known as Cerro de Nexe, at the northern limit of the municipality of Faro (Algarve, Portugal) (Fig. 1). The cave entrance has nearly vertical sides. Its bottom, about 6 metres below the surface, presents several large blocks resulting from roof collapse, a fact that resulted on the growth of some vegetation inside (Fig. 2).

A 2 × 1 metre test trench, excavated in 1988 in the northern sector of the cave under the direction of LGS, uncovered an occupation layer, at 150-200 cm below the cave deposit surface, called the “midden horizon”. It is formed by small eboulis, charcoal and ash lenses, and contains mollusc shells, human and faunal remains, bone tools, chipped stone artefacts and numerous potsherds. For cave plan and stratigraphic profiles of the test trench, see figures in Straus *et al.* (1992; see also Crispim *et al.* 1993). Detailed reports on the excavation results are also available in the mentioned articles, where the site and its archaeology are extensively presented. Thus, the aim of this paper is to discuss the Neolithic material culture, subsistence strategies and funerary practices at Algarão da Goldra in face of the finer chronological assignment permitted by the recent dating of three samples of human remains.

### 1. THE NEOLITHIC CONTEXT AT ALGARÃO DA GOLDRA

The rich artefactual inventory from the “midden horizon” includes an abundant assemblage of potsherds –25 rim sherds (two of them decorated with an incised incised body sherd, two lug sherds, and 188 plain body sherds– and an intact line below the lip; see Straus *et al.* 1992: fig. 5), four ridged body sherds, one vessel.

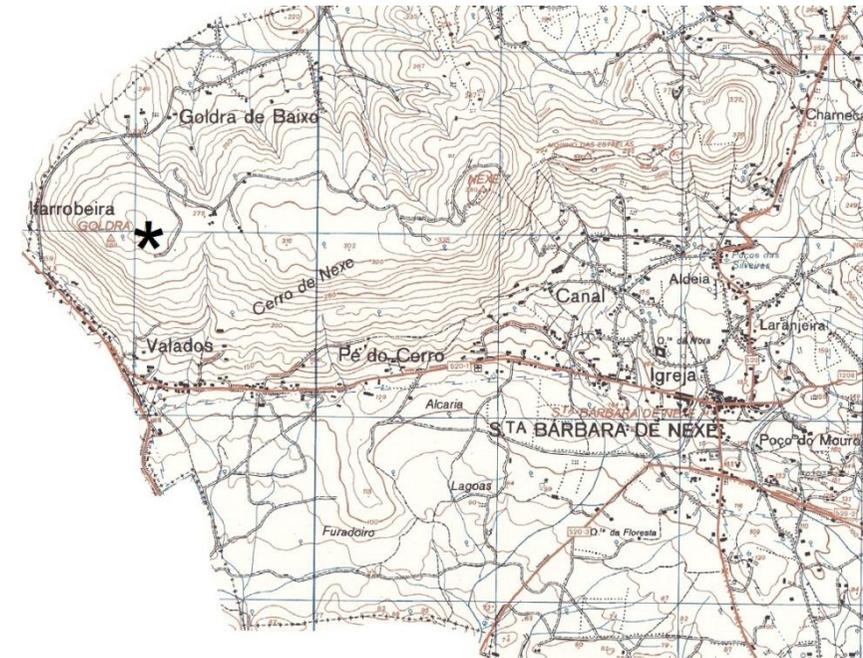


Fig. 1.— Location of Algarão da Goldra in the north-western sector of Faro municipality (from map at 1:25.000)



*Fig. 2.— View of the Cerro de Nexe from the coast (arrow points to the location of the cave site)*

This is a bowl (5,3 cm high and 19,5 cm wide at the mouth) with a rounded base and an incised line below the rim associated to concentric semicircles (Fig. 3). Bone artefacts include two awls made on ovicaprine distal metapodials, one spatula on a large polished mammal rib fragment, and one heavily polished ovicaprine distal metapodial with engravings (a carved effigy face?). Chipped lithic artefacts are scarce, consisting of only three unretouched flint blades and four flakes (all flint, except one which is milk quartz). Groundstone artefacts include two physically associated handstone and slab millstone pairs.

Marine molluscs are abundant in the “midden horizon”. They include peppery furrow shells (*Scrobicularia plana*), which is the most abundant, razor shells (*Solen marginatus*), rare great scallops (*Pecten maximus*), and an unidentified large bivalve. These molluscs were not analysed; thus quantitative data, and therefore the determination of shell weight as part of the total subsistence economy, are not available. However, isotope determinations from human bone samples indicated terrestrial diets only, which means molluscs represented only a small portion of the diet (see below).

Avian fauna recovered consists of one partridge (*Alectoris rufa*) and two pigeon (*Columba* sp.) bone remains. In spite its scarcity, these are important pieces of evidence on subsistence strategies (if their consumption by the Goldra’s Neolithic inhabitants is assumed), since the only other record of birds in Neolithic Algarve is at the Vale Boi open air site, dated to the Early Neolithic (Carvalho *et al.* 2008).

Mammal remains are represented by 37 identifiable bones, comprising ungulates, carnivores and lagomorphs, distributed among the following species with their respective representations: cattle (*Bos taurus*): NISP =7; MNI =1; sheep /Goat (*Ovis aries/Capra hircus*): NISP =3; MNI = 1; swine (*Sus* sp.): NISP = 18; MNI = 2; dog (*Canis familiaris*): NISP=7; MNI=2 or 3 and rabbit (*Oryctolagus cuniculus*): NISP = 2; MNI = 1.

Because the swine remains belong to young individuals, it was impossible to determine whether these are wild boars or domestic pigs, or both. If the former possibility is correct, these would be the only wild mammals recorded at the site. In any case, it is clear that the inhabitants of Algarão da Goldra were practicing animal husbandry and some form of agriculture (as suggested by a single cereal pollen in the sediments). Pollen, wood charcoal and rodent data all point to episodes of local deforestation (for farming and or grazing?), abandonment and regrowth of plant cover (Crispim *et al.* 1993).

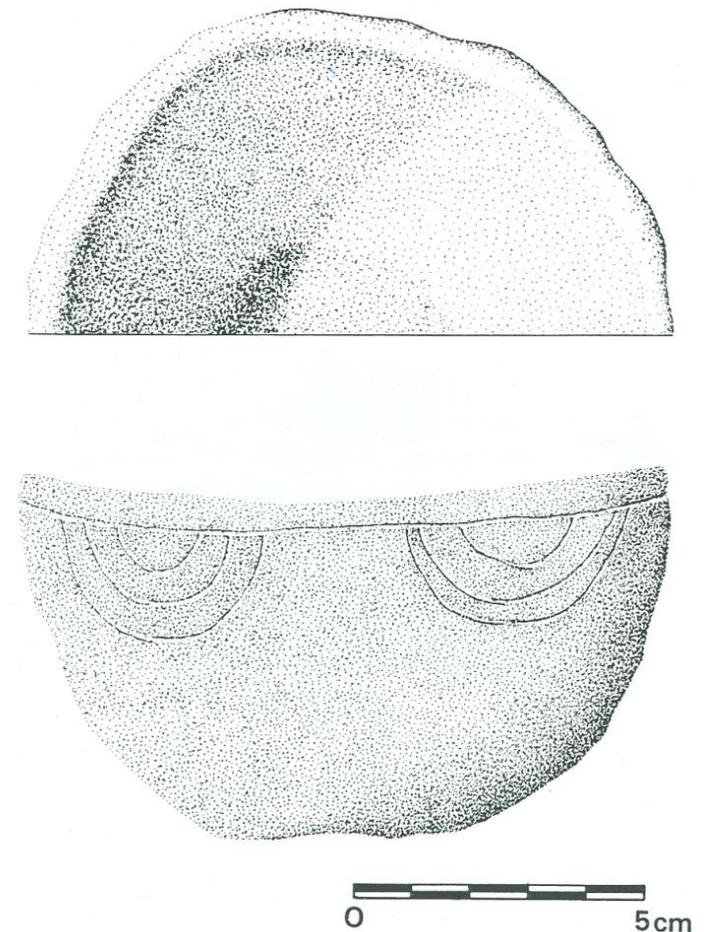


Fig. 3.— Bowl decorated with a line below the rim and descending semi-circles (after Straus *et al.*, 1992: fig. IV), a type-fossil of the Middle Neolithic period in central and southern Portugal

The “midden horizon” revealed a large number of human remains, corresponding to seven individuals: two adult females, one adult male, and four children/juveniles. Causes of death could not be determined, and demographic inferences are strongly limited by the low number of individuals (in spite the apparent high ratio of non-adults). With regard to pathologies, one of the females shows considerable tooth wear and alveolar recession, and also an advanced state of osteophyte on the cervical vertebrae (resulting from stresses to the neck caused by carrying loads on her head?); the male presents the beginning of the ossification on the neural arches of the vertebrae.

## 2. CHRONOLOGICAL ASSIGNMENT AND RADIOCARBON DATING

Based on material culture items –namely the large percentage of plain pottery–, Algarão da Goldra was attributed to the Middle Neolithic of Southern Portugal. This conclusion was first supported by a radiocarbon determination of a bulk sample of unidentified charcoal (Straus *et al.* 1992):

SMU-2197: 4990-320 BP.

Sample: charcoal.

Calibration: 4228-3378 cal BC (1 sigma) and 4487-2936 cal BC (2 sigma).

However, as evident by the calibration result, its large standard deviation urged for further determinations preferentially making use of short-lived samples in order to obtain shorter intervals. Thus, three samples of human remains exhumed from the “midden horizon” (individuals #5, #6 and #7) were selected for AMS dating at the University of Waikato (New Zealand). The results are the following:

Wk-31386: 5336-55 BP .

Sample: right astragalus from “individual #5”.

Calibration: 4246-4055 cal BC (1 sigma) and 4328-4004 cal BC (2 sigma).

Wk-31387: 5323-48 BP.

Sample: fragment of occipital from “individual #6”.

Calibration: 4234-4056 cal BC (1 sigma) and 4322-4001 cal BC (2 sigma).

Wk-31388: 5642-34 BP.

Sample: left patella from “individual #7”.

Calibration: 4525-4449 cal BC (1 sigma) and 4545-4368 cal BC (2 sigma).

### 3. DISCUSSION

#### 3.1. Chronological and cultural integration

As evident in Figure 4, the Waikato dates for Algarão da Goldra cover essentially the lower third of the SMU-2197 result after calibration (roughly the 4500-4000 cal BC interval). This fact, associated with the presence of two potsherds and an intact vessel decorated with an incised line below the lip, indicates a transitional phase between the evolved Early Neolithic and the Middle Neolithic in the Algarve and Alentejo regions of Southern Portugal, of which these pots are type-fossils: the so-called “Early Middle Neolithic”. This period is characterized by the building of small tombs, of cist type, for individual burials, named “Proto-megalithism” given its evident lack of monumentality (e.g. Silva and Soares 2000). Only later during the Middle Neolithic (c. 3800–3200 cal BC) would the earliest megalithic passage graves for collective burials be built in the mentioned regions.

Figure 4 also shows contemporaneity between Goldra and two other sites in the Algarve: Alcalar 7 and Castelo Belinho. The former refers to structures located beneath the mound of a large megalithic grave: two pits with shell remains (dated to an occupation event at the site around the end of the 6th millennium BC) and two hearths dated to the mid of the following millennium (Sac-1794 and

Beta-180978 refer to “hearth 1” and Beta-180181 to “hearth 2”). Since the megalithic tomb was built in the 3rd millennium BC, the latter structures cannot be interpreted as the remnant of any “foundational ritual”, but rather to another Neolithic occupation of undetermined nature (burnt syenite millstones were the only artefacts found inside). The latter site is an impressive cemetery composed by funerary pits with individual burials (only “structure 2” and “structure 59” revealed two individuals, a child and an adult in both cases) consistently dated to the 4500-4000 cal BC time period (Gomes 2010; 2012). Stone and ceramic artefacts are uncharacteristic, but the presence of bracelets made of dog cockle shell (*Glycymeris* sp.) parallels Middle Neolithic burials known in Portuguese Estremadura.

### 3.2. Funerary practices

Observations made during the excavation of Algarão da Goldra permitted Straus *et al.* (1992: 152) to conclude that “[t]he remains were not found in anatomical connection (although some of the vertebrae were clustered) and seem to have been scattered in the midden fill like the faunal remains and other trash. The mixture of bones from different individuals would argue against deliberate entombment; a more casual burial procedure would seem to be the case”. This is now somewhat problematic if one considers the individual burial practices recorded at coeval Castelo Belinho (Gomes 2010, 2012) or presumed at Proto-megalithic tombs as described above (Silva and Soares 2000). Indeed, the evidence from Goldra does not even entirely match intentional, collective funerary practices, primary or secondary, as those that will be observed elsewhere in the following Middle Neolithic. Only the resumption of excavations at the site could clarify this issue.

In any case, Goldra stands sandwiched between the individual burial practices typical of the Early Neolithic –which lasted at least until the end of the 5th millennium BC, as clearly attested at Castelo Belinho (Gomes 2012)– and

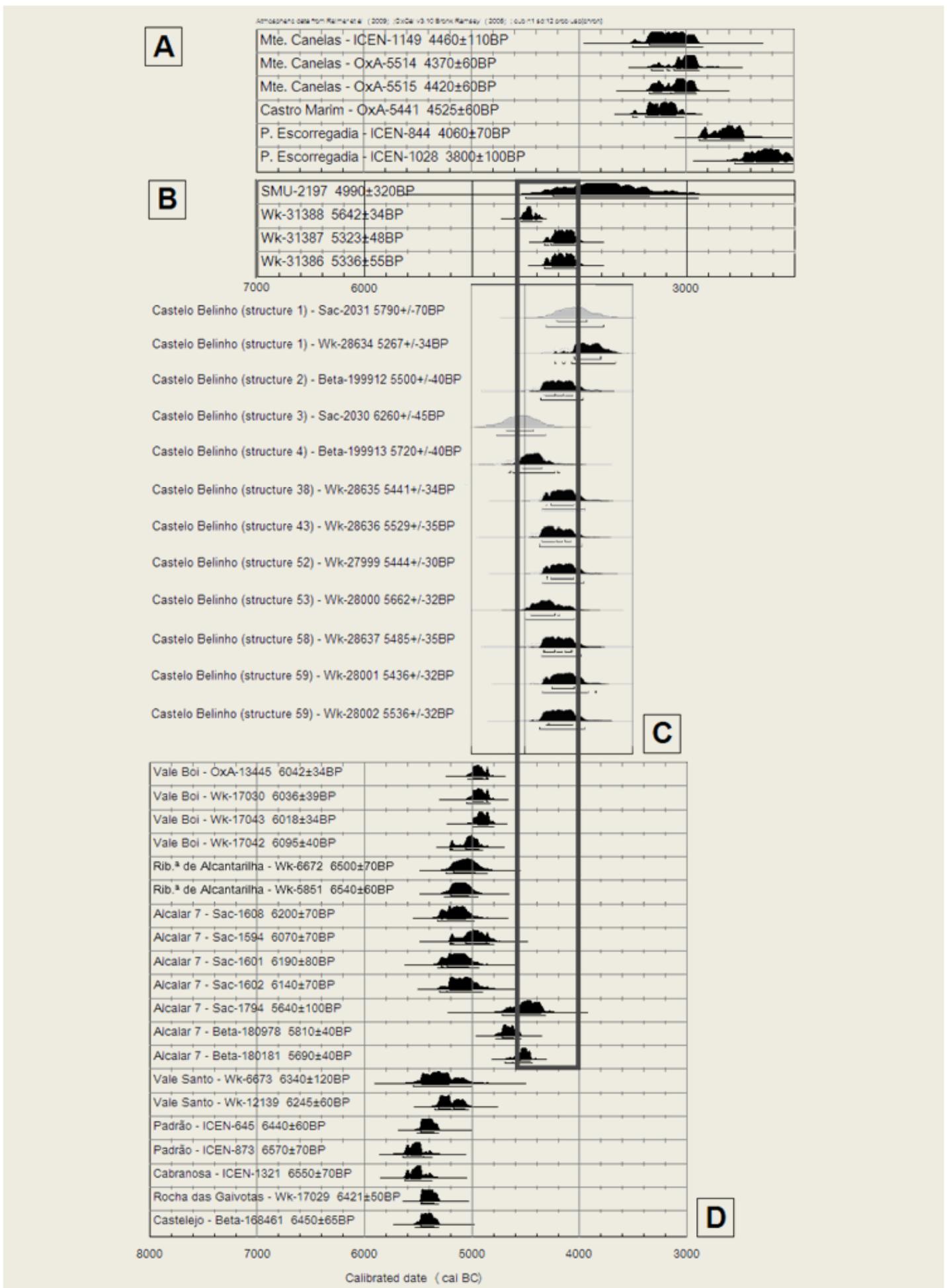


Fig. 4.— Chronometric framework of the Neolithic in Algarve. A: Late Neolithic and Chalcolithic collective graves; B: Algarção da Goldra; C: Castelo Belinho individual burial pits (after Gomes, 2012: fig. 8, adapted); D: Early/Middle Neolithic camps and shell middens. Vertical grey bar corresponds to the “Early Middle Neolithic” period (see text)

collective practices typical of megalithic graves, as is the case of Monte Canelas hypogeum (Parreira and Serpa 1995) and Castro Marim grave (Gomes *et al.* 1994), dated to the second half of the following millennium in Algarve (Fig. 4).

### 3.3. Subsistence strategies

In spite the apparent absence of agriculture evidence –a fact probably due to taphonomic and functional limitations of the excavated sites–, Early Neolithic subsistence strategies are already documented in the Western Algarve (Carvalho 2010; Dean and Carvalho 2011; Dean *et al.* 2012). These included marine and estuarine food sources (fish and molluscs) whenever available, but the most notable feature is the presence of domesticates: sheep and/or goat (*Ovis aries/Capra hircus*) and cattle (*Bos taurus*). Alongside these there are also remains of swine (*Sus* sp.), which can be both wild and/or domestic, rabbit (*Oryctolagus cuniculus*) and red deer (*Cervus elaphus*). With the exception of Vale Boi, most faunal assemblages are however poorly preserved and do not provide reliable estimates on the variation between domestic and wild species.

As mentioned above, Algarão da Goldra has direct faunal and botanic evidence for production economy. Moreover, its location is not random (Fig. 2): from Cerro de Nexa its inhabitants would have had easy access to excellent agricultural land both to the south on the coastal plain and to the north in the valley of Loulé. At least molluscs (and most probably fish and seabirds) from the Ria Formosa coastal lagoon were exploited, as shown by the remains recovered at the cave. The limestone slopes and summit of Cerro de Nexa, or even the schistose Caldeirão Mountain (with maximum elevations above 500 metres) to the north, would have provided good grazing, especially for ovicaprines. Stable isotopes determinations obtained from the radiocarbon dated individuals point to a full terrestrial-based economy with no observable marine component in diets:

Individual #5: -18,97‰ ( $\delta^{13}\text{C}$ ) and 9,80‰ ( $\delta^{15}\text{N}$ ).

Individual #6: -18,78‰ ( $\delta^{13}\text{C}$ ) and 6,68‰ ( $\delta^{15}\text{N}$ ).

Individual #7: -19,60‰ ( $\delta^{13}\text{C}$ ) and 8,41‰ ( $\delta^{15}\text{N}$ ).

These results are in line with those of H.P. Schwarcz reported in Straus *et al.* (1992):  $\delta^{13}\text{C} = -19,55\text{‰}$  and  $\delta^{15}\text{N} = 8,78\text{‰}$  (individual #1), and  $\delta^{13}\text{C} = -19,27\text{‰}$  and  $\delta^{15}\text{N} = 8,74\text{‰}$  (individual #5; same as above).

Later Neolithic habitation sites are unknown in the Algarve, but large walled or ditched Chalcolithic settlements have been under excavation. The only one with published palaeobotanic and zooarchaeological data, Alcalar (Morán 2001), has evidence for a developed farming economy including domestic plants recovered in storage pits –barley (*Hordeum vulgare*), wheat (*Triticum* sp.), broad bean (*Vicia faba*), pea (*Pisum sativum*) and flax (*Linum usitatissimum*)– and animals – ovicaprines (*Ovis aries/Capra hircus*), cattle (*Bos taurus*) and pig (*Sus domesticus*). Clearly this is a different economic system; the settlement itself – considered a “central place” by the author of the excavations– is testimony of a fully sedentary society contrasting in all accounts with the available evidence from the cave site of Goldra.

#### 4. CONCLUSIONS

Given its very diversified and rich archaeological record, Algarão da Goldra can still be considered today, 25 years after its testing, one of most important Neolithic sites in the Algarve region. Its new radiocarbon dates and stable isotope determinations provide a finer chronological positioning of its occupation and sounder comparisons with other sites of the regional Neolithic sequence. This is particularly the case of Early Neolithic sites excavated during the last decade in the region.

However, the open questions are twofold. First, the resumption of the excavations at Goldra would be needed in order to increase the volume of information on material culture, subsistence strategies and the human remains. In the latter case new field observations should focus specifically on the apparent lack of formal burial practices. Second, since Middle and Late Neolithic open air habitation sites are presently unknown in the region, systematic field survey should be carried out to obtain a larger, more complete picture of the human geography in the Algarve during these later phases of the period.

The radiocarbon dating project presented in this paper took place in the framework of a larger research project entitled “Transformações alimentares/populacionais na transição dos caçadores-recoletores do Mesolítico para os primeiros agricultores do sul da Península Ibérica”. This was funded by the Council of Rector of Portuguese Universities (CRUP) in 2010-2011 and carried out under the direction of AFC.

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