SAGVNTVM

PAPELES DEL LABORATORIO DE ARQUEOLOGÍA
DE VALENCIA
EXTRA-13

WOOD AND CHARCOAL
EVIDENCE FOR HUMAN AND NATURAL HISTORY

ERNESTINA BADAL – YOLANDA CARRIÓN – MIGUEL MACÍAS – MARÍA NTINOU
(COORDINATORS)

VNIVERSITAT DE VALÈNCIA
FACULTAT DE GEOGRAFIA I HISTÒRIA
Departament de Prehistòria i d'Arqueologia

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Plants in a funerary context at the Jabuticabeira-II shellmound (Santa Catarina, Brazil) – feasting or ritual offerings?

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***Summary**: Anthracological and archaeobotanical analysis from the Jabuticabeira-II shellmound site presents evidence of plant selection related to mortuary practices. Sediments from excavated areas were sampled and charcoal remains obtained by flotation. Among the 2193 charcoal fragments analyzed in funerary features, 264 correspond to seeds and palm fruits. The presence of these edible plants, strictly associated to funerary features, corroborates the hypotheses of feasting practice and/or mortuary offerings.*

***Key words**: Shellmound, archaeobotany, feasting, charcoal.*

INTRODUCTION

Shellmound builders occupied the Brazilian coast during the Holocene. They are considered efficient and well succeeded fisher-gatherers, highly adapted to the coastal environment. These archaeological mounds, locally named *sambaqui*, usually have a complex stratigraphy, including alternating sequences of shell deposits and thin dark layers composed by burials, hearths and frequently postholes (Gaspar 2000).

Issues related to diet and subsistence have always been amongst the main interests of Brazilian shellmound research. The importance of plant resources in the diet of these populations begins to be widely accepted (Scheel-Ybert *et al*. 2009b), however, the participation of plants in ritual activities had never been suggested.

Sambaqui Jabuticabeira-II (southern Brazil) is formed by numerous alternate layers of funerary and "constructive" deposits. The latter are characterized by small mounds of shells and sandy sediments virtually devoid of cultural archaeological remains, disposed above the funerary structures. Funerary layers are extremely rich in hearth features, charcoal, artifacts and faunal remains (Fish *et al*. 2000).

The presence of nuts and seeds in the site sedi-

ments had already been perceived (DeBlasis *et al*. 1998; Fish *et al*. 2000; Gaspar *et al*. 2002); however, the possibility that these food remains were associated with the funerary rites was never hypothesized. Nor did previous anthracological analysis at the site raise this issue, as analysis of the material of constructive layers did not reveal any trace of food, not even palm nut fragments, which tend to be particularly frequent in *sambaqui* sediments (Scheel-Ybert 2001b).

Gaspar (2004) considers that funerary ceremonies were central in the lives of *sambaqui* people, something particularly evident in the case of the Jabuticabeira-II site. At this site, funerary features (pits and burials) were found either in the excavation areas or along several profiles. Abundant fish remains in these features point to the practice of ritual food offerings to the dead and/or funerary feastings (Klökler 2001, 2008). However, these ceremonies have always been associated with consumption of seafood only.

MATERIAL AND METHODS

The site Jabuticabeira-II, which measures 400 m x 150 m and up to 8 m in height, is situated in the Jaguaruna region, on the southern coast of Santa Catarina State, Brazil, *c*. 1 km from the southwestern margins of Garopaba do Sul Lagoon and *c*. 6 km from the sea (22J 699489/6835694 UTM) (Fig. 1).

The climate is temperate sub-hot, with winter mean temperatures over 15ºC and no dry season. Mean annual temperature is 20ºC and mean precipitation is 1400 mm/yr. The natural vegetation is almost absent from this region nowadays, but the site is situated in the phytosociological domain of the *restinga* ecosystem, typical of the Brazilian coast while the Atlantic Forest is situated inland, in more elevated topographical areas.

Anthracological sampling was carried out in a profile of Trench 18 (T18), in Locus I (Fig. 2). The samples analyzed and presented in this paper were collected from a funerary area located between 3.30 and 4.00 m deep. The excavation followed the natural stratification, separating the sediment samples of each identified feature. All the sediment taken from this excavation unit was floated for charcoal recovery.

Charcoal samples obtained through this procedure were grouped according to archaeological features, resulting in 15 samples named according to an alphanumeric code (A1 to A15).

The charcoal pieces were manually broken along the fundamental wood anatomical sections and examined under a reflected light microscope for systematic determination. Fruit and seed identification was based on external morphology and morphometric data, compared to the relevant literature and to a reference collection. The frequency of carpological remains in each sample was calculated from the ratio *number of*

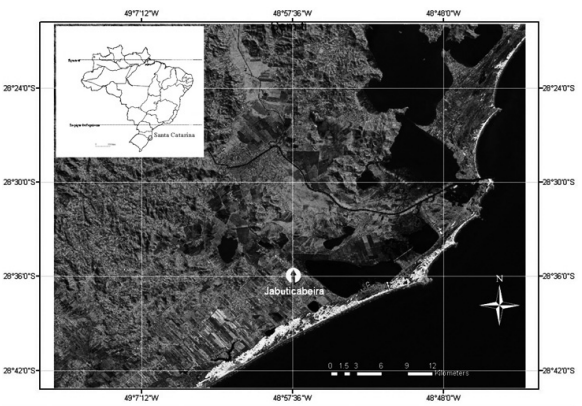

Figure 1. Jabuticabeira-II site location. Cartographic base Landsat 5 (1984).

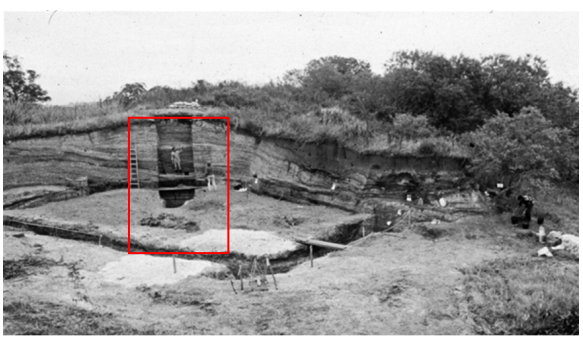

Figure 2. Jabuticabeira-II site, Trench 18-Locus 1, anthracological sampling.

seeds and palm nuts / number of charcoal fragments. The aim of using the number of charcoal fragments in the denominator, rather than simple percentages, is to control for differential preservation of the remains (Miller 1988).

Due to the particularities of the different classes of plant remains, charcoal fragments, root pickings, tubers, fruits and seeds are generally differentially preserved in the sediment. Charcoal remains, resulting from the fuel that feeds the fires, are easily preserved, especially because they constitute one of the most resistant to degradation biological elements that exist. In the case of food remains, however, their potential for preservation depends, among other things, on the characteristics of the plant tissues involved – hard parts, in principle, preserve more easily than fleshy parts.

In addition, one must consider that the conservation of plant residues under humid tropical climates occurs almost exclusively by carbonization, and depends on the material being exposed to fire or not, intentionally or accidentally, seeking its preparation or consumption (Scheel-Ybert 2001a).

In a ritual context, the preservation of these elements will depend both on the characteristics of plant tissues as on the way they are offered or used in the ceremony. Therefore, using the number of charcoal fragments in the denominator allows comparing data from different samples.

RESULTS AND DISCUSSION

All charcoal fragments over 4mm were analyzed, attaining almost 4000 analyzed pieces. The 1788 charcoal fragments analyzed from "constructive" layers allowed the identification of 40 taxa in 28 botanical families (Scheel-Ybert 2001b). In the funerary layer, the analysis of 2193 charcoal fragments provided 116 taxa from 40 families (Bianchini 2008). The number of taxa varies between 30 and 50 per sample, which represents a high floristic diversity.

Most of the identified specimens correspond to taxa found in the open *restinga* and *restinga* forest formations (the *restinga* being a mosaic of different xerophyte vegetation types typical to the coastal beach ridges), demonstrating that Jabuticabeira-II was situated in a similar environment to that related to other *sambaquis* (Scheel-Ybert 2000, 2001b; Scheel-Ybert and Dias 2007; Scheel-Ybert *et al*. 2009a). Myrtaceae and Lauraceae were the most representative plant families. A large proportion of Atlantic Forest (an ombrophilous tropical forest) species suggest that this plant formation occurred not very far from the site, probably in the more elevated slopes inland. Araucaria forest elements, especially in the constructive layer, attest to the exploitation of farther subtropical forests (Scheel-Ybert 2001b).

Charred remains of fruits and seeds were abundant in virtually all samples of the funerary features, conversely to the constructive package, where strictly no trace of carpological elements was found (Scheel-Ybert 2001b) (Fig. 3). This is particularly significant considering that the samples from the burial layers correspond to 70 cm of the profile, while the constructive package totals 3 meters.

Among the charcoal fragments analyzed in funerary features, 264 correspond to food remains, with 149 seeds and 115 palm nuts present in most features.

A high proportion of fruits and seeds remain as yet unidentified, due to difficulties in determining the charred material, particularly because of the strong fragmentation and lack of supporting material. The intense fragmentation of charred fruits and seeds greatly complicates the determination based on morphometric characters. Although their internal anatomy, as a rule, is quite characteristic, descriptions in the relevant literature are rare. Besides, fruits and seeds are generally fragile structures and studies on the processes of change, both by the action of fire as by the action of post-depositional processes, are practically nonexistent.

From the 55 specimens already determined, there are individuals belonging to the families Cucurbitaceae (1), Myrtaceae (17), Annonaceae (19) and Are-

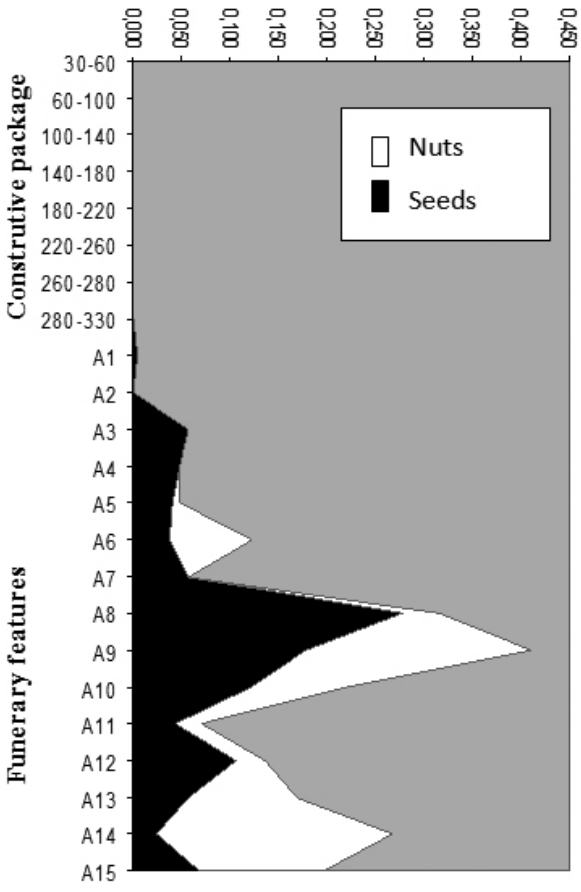

Figure 3. Jabuticabeira-II site, Locus 1, Trench T18. Seeds and palm nuts ratios.

caceae (18) (Fig. 4), all of which produce edible fruits.

The significant frequency of seeds and fruits in certain features clearly demonstrates they were food remains. The archaeological context indicates that they are certainly related to the practice of funerary feastings or offerings. All the samples of the funeral package included fragments of seeds and/or palm nuts.

The abundance of carpological vestiges related to the total number of charcoal fragments was 12%, which is quite significant, given all the factors that lead to differential preservation of these elements compared to wood. Contrary to expectations, most of these (149) are seed fragments, suggesting a major contribution of fleshy fruits in detriment of palms in the funerary ritual.

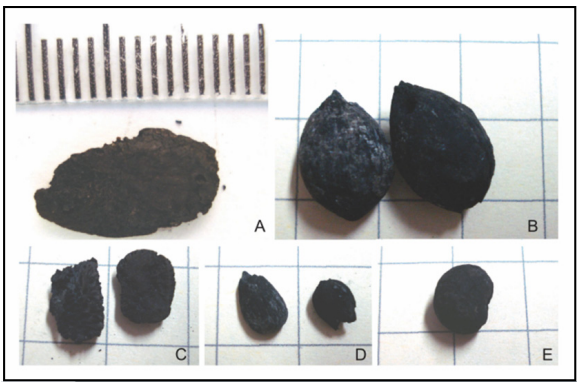

Figure 4. Seeds from the funerary area in Trench T18 anthracological sample of sambaqui Jabuticabeira-II. A – Cucurbitaceae; B - *Syagrus* sp (Palmae); C – Annonaceae; D – *Rollinia* sp (Annonaceae); E – Myrtaceae.

The highest proportions of these elements were verified in samples A8, A9, A10 and A12. Samples A8 and A9 correspond to sediments with heavy concentrations of fire traces, fish bones, shell, oysters and thermal flakes. The evidence suggests that they represent the "apex of the ritual", the product of an ordered series of collection activities and disposal of different types and materials. Sample A10, in turn, is a fireplace next to the burial with many charcoals, while A12 has been described as a layer of ash with postholes. Both samples are clearly related to important parts of the funerary ritual.

Several recent studies have associated the presence of plant foods in funerary contexts with the practice of feasting (Pauketat *et al*. 2002; Rosenswig 2007). Along the same lines, the data presented here might support the hypothesis of feasting or funerary offerings suggested by zooarchaeological analyses (Klökler 2001, 2008).

Feastings, in general, require considerable investments of time, effort, and resources. In traditional societies, this is one of the main occasions of mobilization work, where power is highlighted and sociopolitical relations of values established and solidified. As a result, a great feast involves a major investment in the production of surplus (Adams 2004).

The data obtained from the anthracological and archaeobotanical analysis of funerary layers of Trench 18, either regarding charcoal or carpological remains, are suggestive of a series of ordered activities and intense mobilization, not only for the construction of the burial mounds themselves, but also with regard to aspects such as collecting firewood, collecting and placing stakes and mobilization regarding the collection of fruits and other foods and/or offerings.

How long and how often would the fires be lit to produce such a rich anthracological record? How many fruits would be needed? Would there be major investment in the collection of specially selected fruits for the feast?

Feasts do not justify the use of "luxury foods", but are an ideal reason for their existence. It is also suggested that the first domestication may have occurred from the intensification of the processes of collection and management, especially of foods which consumption context was ritual (Hayden 2003).

On the other hand, the funerary rituals are part of the routine of a group. They are strategies of operation in which people reproduce the conditions of their own lives (Barrett 1990). Thus, ritual practices and domestic activities may be closely related in many ways (Hodder 2005). Therefore, it is very likely that these foods were also consumed daily.

At this stage of knowledge, we cannot say if these seeds are the product of gathering, management or cultivation. Whatever the case, their presence at the site and intentionality may be taken to mean a large investment of labor. On the other hand, draws our attention the fact that all the identified seeds (Cucurbitaceae, Myrtaceae, Annonaceae and Palmae) have a long history of relationship with human populations, all of them belonging to families in which several species have been domesticated.

It cannot in any way be said that these mound-builders were farmers or that they were performing the domestication of plants, as there is, so far, no clear indication of this. However, the hypothesis that these people managed horticultural plants has already been presented and has been corroborated by several evidences (Scheel-Ybert *et al*. 2009b).

CONCLUSIONS

All the samples related to the funerary layer analyzed here showed the presence of seeds and/or palm nuts, contrary to the samples of the constructive package, where no evidence of these elements was found. The highest proportions of carpological elements were obtained in samples with higher concentration of vestiges associated to the funerary ritual. The significant frequency of food remains in certain features of the burial structure is certainly related to the practice of funerary offerings or feasts, corroborating the hypothesis proposed by zooarchaeological research.

New studies are still needed aiming to a better comprehension of the use of plants in domestic and ritual contexts of Brazilian shellmounds. Still, the results here presented are quite revealing, not only for their unprecedented nature, but mainly because of the context to which they are related.

The data presented, as well as all the issues raised, point to the urgent need for strengthening archaeobotanical research in Brazilian sites, hoping they can bring, as soon as possible, some answers to these questions.

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