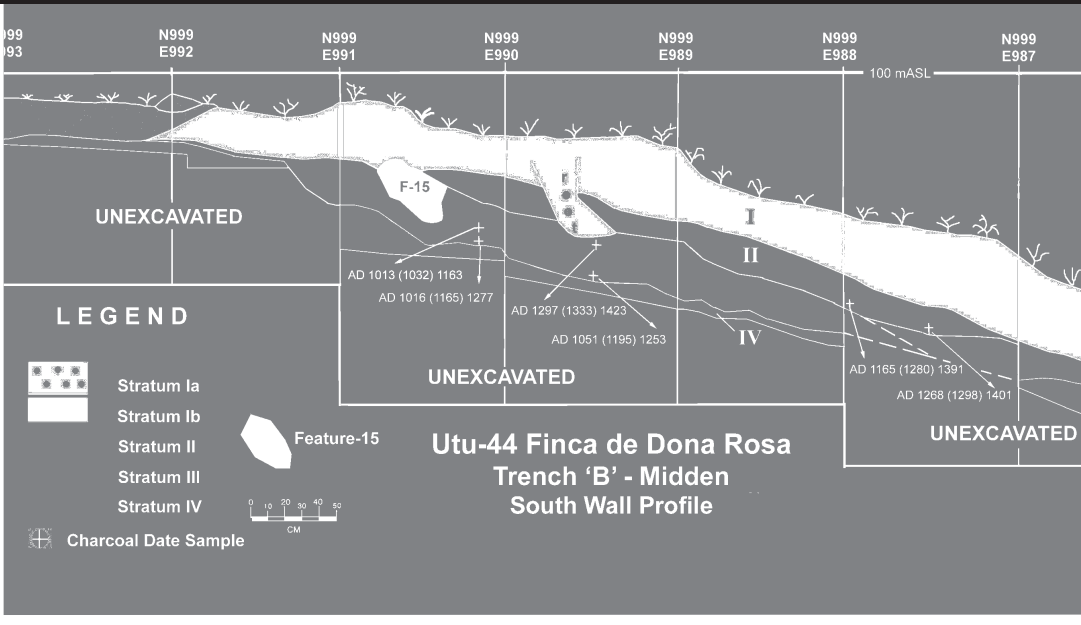
Oliver, J. R. and Y. Narganes Storde (2025). The zooarcheological remains from Juan Miguel Cave and Finca de Doña Rosa, Barrio Caguana, Puerto Rico. Ritual Edibles or Quotidian Meals? In: Proceedings of the 20th International Congress for Caribbean Archaeology. Held in Santo Domingo, 2003. Edited by Glenis Tavarez María and Manuel García-Arévalo, pp. 227-242. Published by Museo del Hombre Dominicano and Fundación García-Arévalo, Santo Domingo R.D. ISBN 99934-813-6-X

José R. Oliver • Yvonne M. Narganes Storde



The Zooarcheological Remains From Juan Miguel Cave And Finca De Doña Rosa, Barrio Caguana, Puerto Rico. Ritual Edibles Or Quotidian Meals?

Resumen

Las recientes investigaciones en la zona cársica de Caguana han arrojado nueva información acerca de las actividades de caza y/o captura de animales por grupos agroalfareros del período Ostiones (1050-1300 dC). Comparamos los restos zooarqueológicos recuperados en un basurero de carácter doméstico del sitio de habitación 'Finca de Doña Rosa' (Utu-44) con los de la cueva funararia-ritual de 'Juan Miguel' (Cag-3), ubicada a cerca de Utu-44. La discusión gira en torno a la posible distinción entre aquellos manjares de carácter ritual en contraste con los alimentos de consumo cotidiano (comida) y de caráracter doméstico que constituyen el aporte nutricional básico del grupo. Es posible que la buruquena (Epilobocera sinuatifrons) haya sido un manjar íntimamente vinculado a las actividades rituales relacionadas a exequias fúnebres, el culto a los difuntos y/o a actividades ceremoniales relacionadas con los petroglifos.

Abstract

Research in the karst zone around Caguana has yielded new data regarding animal hunting/procurement activities by pottery-bearing groups of the Ostiones period (AD 1050-1300). We compare the zooarchaeological remains recovered from a domestic midden at the habitation site Finca de Doña Rosa (Utu-44) with those found at the ritual-ceremonial funerary cave of Juan Miguel (Cag-3), located near Utu-44. The discussion focuses on the possible distinction between ritual edibles in contrast to domestic foods (staple dishes) that constitute the basic quotidian sustenance of the group. It is possible that the river crab (Epilobocera sinuatifrons) was one of these ritual edibles, intimately linked to rituals related to bruials, the cult to the ancestors and/or ceremonial activities involving petroglyphs.

Resumé

Les recherches récentes dans la région karstique de Caguana ont apporté de nouveaux éléments sur les activités de chasse et/ou de capture des animaux par les groupes céramistes horticulteurs de la péeriode Ostiones (1050-1300 ap. J.C.) Nous comparons les restes archéolzoologiques provenant d'une zone de rejet domestique du site d'habitat « Finca de Doña rosa » (UTU-44) avec ceux de la grotte rituelle funéraire de « Juan Miguel » (Cag-3) localisée près de UTU-44. La discussion tourne autour de la distinction possible entre les mets (manjares) de caractère rituel avec les aliments (comida) de consommation quotidienne et d'origine domestique, qui constituient l'apport nutritionnel principal du groupe. Il est possible que le crabe de rivière (Epilobocera sinuatifrons) ait pu être un des ces mets intimement lié aux activités rituelles de funérailles, de culte des ancêtres et/ou aux activités cérémonielles liées aux pétroglyphes.

Quotidian Foods and Ritual Edibles

In the increasing volume zooarchaeological literature of the Caribbean it is uncommon to find an explicit discussion between those food categories that relate to quotidian sustenance consumption ('subsistence' sensu stricto) and those foods that are reserved for consumption in a ritual act or ceremonial feast (Reitz and Wing 1999:274-276, 332-334). While we now have gained considerable knowledge on the dietary/nutritional values of animal and plant remains (e.g., DeFrance et al. 1995) the range of 'natural' habitats hunted, gathered and/or harvested by pre-Columbian natives (Narganes 1982, 1985, 1993, and this volume), its economic implications (Wing 1991), and most certainly have achieved greater sophistication in both sampling and quantifying the data (DeFrance 1990), there still remains a noticeable gap in what might be labeled the 'anthropology of archaeological food'. This phrase refers to the social, cultural and cognitive behaviors and attitudes associated with the full spectrum of edibles, not only those foods including animals but also plants and minerals (e.g., salt). From ethnography (e.g., Hugh-Jones 1979, Hugh-Jones and Hugh-Jones 1993), we know that all societies practice a variety of (plant/animal) food prescriptions, restrictions

and prohibitions (taboos). These 'rules' are variously applied throughout different stages of entire process of food procurement and production: from the raw resources themselves and from the individual's preparation for animal capturing (fishing hunting) and wild plant foraging/gathering to their preparation (cuisine), presentation ('table' etiquette), consumption, and/or storage. And, likewise, from the preparation of cultivation fields (conucos, montones) to their processing, cooking, and subsequent presentation and consumption. While certain food recipes would be expected to be the staple meals for everyday consumption, others would be reserved only for (or temporarily/permanently barred from) specific social, political and/or religious events.

For example, not only certain meals but also specific ingredients are known to be restricted to the Taíno élite, as is the case of the fine cassava bread, xabxao, and the meat from the iguana (probably Cyclura spp.) (Las Casas 1929:444; Cassa 1974: 61. Newsom (1995) has also presented a case where maize (Zea mays) at En Bas Saline, Haiti, was probably a luxury or prestige ingredient (beverage) reserved for proto-Taíno élites. While the distribution of maize was largely restricted to elite domestic areas, it was also consumed in what appears to be a communal feasting (ceremonial?) context: maize was found in a large garbage pit within the large central, public plaza of En Bas Saline. On the other hand, non-elite domestic areas that lacked evidence of maize were interpreted as having a diet primarily based on tubers such as manioc. The potential for gaining valuable insights on the anthropology of food from world-wide archaeological data is exemplified by the papers presented in edited volumes such as The Prehistory of Food; Appetites for Change (Gosden and Hather 1999) and Consuming Passions and Patterns of Consumption (Miracle and Milner 2002).

However, at present, there is very little hard archaeological evidence in the Caribbean about what sorts of edibles might be restricted to, or excluded from, specific 'ritual' events (e.g., burial feasts, menstruating period diet/taboos, meals for inductees in initiation rites). We acknowledge the inherent difficulties and dangers in establishing causal links between kinds and patterns of archaeological 'food/ingredient' (fauna/flora) remains and the sociocultural (cognitive) values and norms that 'explain' them as food categories (recipes, meals) and attitudes (e.g., taboos) toward them. Likewise we are mindful of the huge conceptual leap between patterns of discarded bones and the type of 'dish' (meal, edible) product that was prepared for consumption. However, we also think that insights into ritual vs quotidian food-use are not beyond the reach of archaeology. In this paper we explore and suggest the means through which we may gain insights about the anthropology of food, in this case animal food, among late pre-Columbian natives of Puerto Rico.

The opportunity to discuss ritual edibles (manjares rituales) in contrast to quotidian meals (alimentos, comida) arises precisely because of the availability of fauna samples from two very distinct archaeological contexts: the cave of Juan Miguel (Cag-3) and the open, habitation site 'Finca de Doña Rosa' (Utu-44). Both sites span the same time range (Periods IIIb-IVa) and belong to the same cultural tradition/series (Ostionan to Chican Ostionoid). While the fauna remains from Cag-3 are associated with various specific, probably short-term or cyclical religious-ritual events, those from Utu-44 represent the refuse of quotidian, domestic meal remains (and other garbage) continuously accumulating over a span of around 300 years. This paper will argue that since the buruquena (the river crab Epilobocera sinuatifrons) occurs in a disproportionately high MNI frequency at Cag-3, and since it is practically absent at habitation site Utu-44, this crustacean was likely a key meat ingredient in the preparation and consumption of an edible food prescribed for, and restricted to, ceremonies and rituals involving burial, the cult to the dead (ancestors) and/or the numinous petroglyphs present in this cave.

Site Location and Its Surroundings

Sites Cag-3 and Utu-44 are located in the northwestern karst belt region of Puerto Rico, characterized by a Humid Karst Forest. They are found toward the southern edge of the belt, which is positioned

east-west between the igneous highland formations and the coastal plains and only 35 Km—or under a day's foot journey to the coastal city of Arecibo (via Vega de Aguirre). Thus, despite being inland or interior, occupants in this region would have easy access to coastal and marine resources. The local topography consists of closely packed limestone conical hills (mogotes) that surround small valleys and dolines (sumideros). The belt is underlain by a vast network of underground river and drainage systems, while side-hill and underground caves abound. A summary of the current geological, hydrological, faunal, and floral characteristics can be consulted in Lugo et al. (2001). Most of he forest in the immediate area, although evincing a mature, climax assemblage, is nevertheless quite recent (50-60 years), as this region was intensively and extensively farmed until about 1940-50s. There is every reason to believe that this landscape was as intensively cultivated and intervened by humans throughout pre-Columbian times. In short, the fauna and floral communities (and ecology) found in today's recovered forest are likely to be different from those of the past, and most certainly from those present before human occupation.

Juan Miguel Cave is located 1.7 Km north of the civic-ceremonial center of Caguana. It is also only 500 meters as the crow flies, due southeast from site Utu-44 (see Rivera and Oliver, this volume: Figure 1). Around the cave there are several other pre-Columbian sites. Directly to the south is site 'Finca Moisés Cintrón' (or Gerena site, in Alegría 1983:91). It includes the remnants of a batey/plaza (19.5 x 13.4 m) within a rise in the valley bottom (Utu-19a), and an associated domestic midden on the abra or 'port' between two mogotes. Ceramics recovered by Alegría in 1949 and us (in 1997-2001) indicate a Capá style affiliation, dating to Period IVa. To the north is Utu-53, another batey (ballcourt) site that entirely lacks evidence of residential or domestic activities (Oliver et al 1999). Less than 200 meters to the east and close to the base of mogote, where Cag-3 is located, there is Cag-4, a large batey site with an adjacent small, circular domestic midden. Site Cag-4 rests on a colluvial terrace sloping onto the edge of the active floodplain and bedstream of the Tanamá River. Both Utu-53 and Cag-4 yielded Capá style ceramics, while the latter also included spheroliths of varying sizes, an unfinished elbow stone and a wide range of chert flakes. However, most of the intense activities at Juan Miguel Cave almost certainly predate Utu-19, Cag-4, Utu-53 and, possibly other nearby sites. 'Finca de Doña Rosa' (Utu-44) is found 2.1 Km north of Caguana (Utu-10) on a lenticular-shaped ridge-top on the left margin of the Tanamá River. About 250 meters directly east of Utu-44, the river sinks underground only to resurface some 200 meters beyond. This area around the first submergence of the Tanamá has an unusual concentration of archaeological sites. The nearest sites to the north are SR-8 and SR-9, two small rock shelters with a few surface artifacts, ecofacts and, at SR-8, petroglyphs also.Two batey sites, Utu-53 and Utu-39, are found further to the east and north. The Utu-44 locus had been briefly cultivated in the early 1960s, and was completely deforested by illegal logging in 1995-6. By the time of our first visit in 1997, the site was entirely invaded by tall 'elephant' grass (of African origin).

Soil acidity (pH) tests performed at both sites yielded high alkalinity readings (8.0) at surface and below surface, and both within anthropogenic and 'natural' soil contexts. The lack of soil acidity does have implications for bone preservation, but in this case the pH level is a feature shared by both sites. One major difference is that Utu-44, being an open site, is exposed year-round to prolonged and/or intense rainfall. In contrast, the cave is relatively dry and only indirectly affected by the exterior weather. This being the case, differences in chitin (crab claws, land snails) and bone (vertebrate) preservation ought to be the result of environmental factors other than soil alkalinity/acidity. Later we shall return to the issue of whether presence/absence of certain animal remains between the two sites is primarily due to environmental conditions or to anthropogenic activities.

Overview of Cueva de Juan Miguel (Cag-3)

Juan Miguel site is a small cave with an entrance facing to the west-northwest. Most of the dome had long ago, perhaps during the Oligocene to Pleistocene, collapsed and fallen into what is today

the Tanamá River. Today's cave is, in effect, only the preserved tail end of the original cavern. One massive limestone rock fall still remains at the entrance of the cave straddling the present drip line and cliff façade. Other large and medium-sized collapsed limestone blocks are also found inside the cave's main chamber ('A'), but tend to cluster on the northern side. The cave consists of a main chamber 'A' facing the entrance and a shaft chamber 'B'. Chamber 'A' covers an area of approximately 10 x 10 meters (100m2) while chamber 'B' is roughly an oval of 6 x 4 meter (24 m2). In vertical cross-section chamber 'B' is tubular-shaped, a shaft obstructed by limestone rocks. The maximum height in the main chamber is just over 5 meters near the entrance (or west), falling to less than 2.5 meters toward the back (or east). Chamber 'A; is relatively well lit, especially in the afternoon hours, whereas chamber 'B' is pitch dark. Due to the trophic characteristics and the small size of the cave, bats and swallows (golondrinas) are only occasional visitors. No guano deposits have been detected in excavations, and only very thin scatters of dung were observed and mainly in shaft-chamber 'B'. The potential intrusion of food remains by bats and golondrinas is considered to be minimal and thus less likely to have been mechanically mixed with human imported food remains. The massive entrance limestone block has protected the sediments from spilling and eroding onto the sharp slope that leads to the Tanamá River further below. The floor-level toward the walls of the main chamber ('A') and all of the floor in the shaft-chamber ('B') consists of mineralized calcite (stalagma). However, toward the central part of chamber 'A', a thin soil deposit was formed by a very slow process of chemical and mechanical erosion of the cave's walls and abode. Very little allochtonous (e.g., windblown) sediments have been deposited on this cave. This soil deposit doubles its thickness toward the entrance, by the massive rock fall. It is the central, sedimented, portion of the cave covering 16m2, that was subjected to 11 excavated units of 1 x 1 meter each in 1997 and 1998. This represents 68.75% of the sedimented floor and 11% of the entire floor of the main chamber. The sampled area of the cave deposits is far greater than that sampled for site Utu-44, even if only midden area is considered.

Thirty-eight petroglyphs were recorded of which Nos. 35 to 37 are dubious. A cluster of 13 petroglyphs (Figure 1: Nos. 10-32) are found in a block-fall with stalagmites located on the northeast corner of chamber 'A'. One of these is not strictly a petroglyph but a graffiti of the date '1881'. In that vicinity two other petroglyphs (Nos. 7-8) are found on the east wall. A solitary petroglyph No. 33 on the northwest corner 'guards' the entrance to the cave. Just outside, simple eye-mouth engravings have transformed the drooping stalactites into biomorphic 'personages' (Figure 2). A singular face (No. 38) and a cluster of five (Nos. 1-5) petroglyphs were engraved on rock-falls facing toward the center of the cave and excavation area. Perhaps equally telling is the fact that much of the east (back) and the south walls, including all of chamber 'B' and the niche gallery, entirely lack petroglyphs. The emphasis is clearly the north side, with petroglyphs 'looking' to the south. A set (nos. 33-37) appears to stand guard at the northeast entrance and look either to the back (east) or to the outside (west). The rest (38, 1-5) form as small set looking south and west toward the center portion of the main chamber. For now we wish only to note that these petroglyphs could have been made by either, or both, Ostiones and Capá groups. Assuming that these were all made by earlier Ostiones groups does not exclude the possibility that later Chican visitors would not have appropriated them for their rituals and imbued them with new meanings.

The total number of ceramics recovered from the surface and all excavations is very small, just 213 sherds. Not a single one included linear or geometric incised and/or punctuated designs. Temper consists of natural inclusions present in the clay sources, although some sources are rich in hematite and iron oxides. In general sherds are relatively hard, even if incompletely oxidized, when compared to typical Capá sherds from the local area (such as at Utu-27). Two tentative 'wares' can be distinguished. One has a relatively well smoothened and even surfaces, some 'polishing' (but opaque when reflecting light), and a light brown to reddish surface (self-slip) devoid of any carbon soot or signs of fire-cooking (i.e., serving ware). The latter are all open, circular bowls with slightly incurving

walls except one that is navicular in horizontal cross-section. A rim from a navicular vessel has a geometric appliqué—the only plastic decoration found for this ware. On occasion, the surface is slipped with a red pigment. The other ware is composed of wide-open bowls (round horizontal cross-section) and usually has flat or rounded rims. No navicular shapes are known for this ware. Decoration is entirely absent. This ware tends to have a darker surface color (brown to dark brown) and is also incompletely oxidized. Surfaces are even but lack any luster and show carbon soot, even crusting (i.e., cooking ware). Microscopic examination of thin-sections suggests the same range of clay sources were utilized to manufacture both wares. In sum, if we were to follow Rouse's (1952) criteria, the ceramic assemblages belong to the 'unmodified' Ostiones style (Period IIIa).

While ceramic attributes and modes indicate an 'unmodified' (or 'early') Ostiones assemblage, the chronological situation is more complex. Only three perhaps four distinct forms (based on rim-wall modes) constitute the entire vessel kit, suggesting a highly limited selection from the full range of forms available for Ostiones style found in habitation sites. All of the Cag-3 vessels (based on rim and wall inflection modes) are probably shapes that persisted into the presumably later 'modified' Ostiones, Period IIIb. This is demonstrated by a suite of radiocarbon dates from Cag-3 (Table 1) that overlap that obtained from Utu-44 (Table 2) in association with what Rouse (1952) would classify as 'late' or 'modified' Ostiones. The case of Cag-3 appearance of being early/unmodified Ostiones is best explained as the result of spatial/functional variability, not time: the natives selected only that segment of the total 'typical' (modified/late) Ostiones vessel set that was required for cooking and serving specific 'foods' (edibles) related to the activities in the cave. It so happened that the selection process focused on the more 'conservative' (i.e., undecorated) vessel forms, which had been present (and preponderant) in the early Ostiones (Period IIIa) ceramic repertoire, and which continued to be used in Period IIIb alongside other more highly decorated (modified) Ostiones vessels.

Lithic artifacts, although present, are even scarcer than pottery (lithic Ct= 38). Several chert flakes were found, some of which were produced via the bipolar flaking technique. Several showed thermal alteration (pock-marks). Most of the lithics, however, are metavolcanic rocks. Finally two unique river pebbles were sliced perpendicular to the long axis ('salami' sliced) and incorporated into Stratum II and the burial fill, Feature-7. (The lithics are presently under analysis by Reniel Rodríguez.) Finally a mahogany-like hardwood artifact (cat. FS-159) of unknown function was found just above the burial tomb's fill. Several other woods with cut marks were also recovered. While most are modern (e.g., clear machete cuts), a few may potentially be pre-Columbian in age. Confirmation will be forthcoming after Newsom concludes the detailed archaeobotanical analysis. Finally the rare marine bivalves recovered showed signs of use as scraping tools, while the equally rare gastropods (one probably Strombus sp.) were primarily used as raw material for manufacturing other artifacts.

Excluding intrusive features, throughout the sedimented portion of the cave's floor there is a compact, relatively hard layer (Stratum I) that seals much of the underlying Stratum II. In portions of the cave the top 5 cm of Stratum I contain inter-stratified lenses of white calcium carbonates and charcoal. The matrix of the underlying Stratum II characterized by a much looser, powdery, alkaline soil. It contains the bulk of the cultural deposit, including abundant gray to whitish ashes, mixed with charcoal, and fairly high densities of landsnails. In most units, this stratum is underlain by a dry hard pan of blocky to angular yellowish-brown clay. In some areas Startum II rests directly on calcite beds that are in turn underlain by clay. The most significant of the cultural features are briefly discussed in turn.

Feature-6, Unit 9 (N51- W54). It consists of the fill of a prepared tomb (Figure 3). The fill included one primary burial (Individual No. 1) and two bones of a secondary burial (Individual No. 2). Individual No. 1 was a circa 25 year-old female laid to rest on her right side, with her legs bent

to the chest in a tight flexed position, while her left arm and hand rested mid-length on her tibia-fibula. A flat, nearly square, smooth igneous rock was placed under her skull as a resting 'pillow'. The distal end (feet) of the body was oriented toward the west (entrance), while the skull leaned sideward, 'looking' to the north. A cut stalagma column was carefully laid on the north side of the burial shaft. The floor of the tomb was artificially prepared by packing a thin, impermeable clay layer extracted from the adjacent Unit 8 (N50-W52). The bones on the right side of the body laying in contact with the impermeable clay rotted away, while those on the left side were preserved probably due to the better aeration of the loose fill soil. The clay floor was underlain by a paleosol with characteristics similar to Stratum II. Based on Edwin Crespo's assessment, several of the bones (e.g., L. humerus, L. ulna) showed signs of post-mortem burn marks. We tentatively suggest that hot charcoals (embers) came into direct contact with some of the already desiccated bones of individual No. 1 when the tomb was back-filled. However, this also could have occurred at a time (still post-mortem) before final interment in this cave.

Feature-6 (tomb fill) contained a second left humerus and an impacted left parietal-occipital skull fragment with clear signs of violent trauma (Figure 4). Both bones show enough distinct qualities to suggest they belonged to the same individual (No 2), but the possibility of two different individuals cannot yet be ruled out. The humerus had been fractured in its proximal end by bending the elbow backwards, against its normal motion of articulation, while the skull had received a bullet-like (projectile) impact that caused a characteristic radial fracture. Crespo noted that none of the lesions showed evidence of healing, suggesting peri-mortem trauma. It is possible that the projectile-like blow to the head was the cause of death and that the body was then (peri-mortem) dismembered. We rather suspect that these bones were intentionally incorporated into tomb back-fill and, hence, related to the burial rituals involving Individual No. 1. Importantly, the remaining skeletal elements of Individual No. 2 were not found in any of the other excavation units or surface areas/crevices of the cave. Two charcoals (GrN-24764, 24766) from within the tomb fill dated to cal. AD 1000 and cal. AD 1170, indicating that the human burial itself dates to AD 1170 or later (Table 1). Since the charcoal assay from the base of Stratum II (GrN-24765), sealing the burial fill Feature 6, dated to cal. AD 1300 (Table 1: Gr-N 24675) it can be reasonably proposed that human burial (No. 1) had to take place between AD 1170 and AD 1300. This suggests at least, ~290 years after the cooking activities around hearth Feature 7, located adjacent to the burial pit.

Table 1. Radiocarbon Dates from Cag-3.

Lab Sample GrN-#	Unit N-W (cm below surface)	Taxon charred wood	Radiocarbon years BP (before present)	Calibrated AD Date (2)
GrN-24765	N51-W54: SIb (10 cm)	Wood taxa 8, 9, 11 cf. Lauraceae, cf. Psidium	680±40	1280 (1300) 1400
GrN-24764	N51-W54: F6 (17 cm)	Wood taxon #12 cf. Montezuma sp.	1060±40	890 (1000) 1030
GrN-24766	N51-W54: F6 (17 cm)	Wood taxon #17 cf. Rutaceae (Amyris?)	890±30	1040 (1170) 1230
GrN-24768	N51-W55: SII (12 cm)	Wood not identifiable	990±40	1000 (1030) 1160
GrN-24767	N52-W54: F7 (22 cm)	Wood not identifiable	1180±40	775 (880) 970
GrN-24769	N51-W55: F7 (29.5 cm)	Wood not identifiable	1140±40	789 (890)-970
24767+ 24769 (∑)	*Feature 7/13 (29.5 cm)*	*Wood not identifiable*	*1420±30*	*790 (890) 970*
GrN-24770	N52-W52: F11 (44 cm)	Wood not identifiable	900±60	1430 (1450) 1620
Gr-A 187657	N52-W50: F4 (31 cm)	Sample not sent for ID	65±45	1710 (1955)-modern
GrN-16414	N51-W50: F4 (57 cm)	Sample not sent for ID	790±50	1170 (1260) 1300

Hearth Feature 7, Units 9, 10 and 11. This hearth feature is located near the feet of Individual No. 1 (Figure 3). It is somewhat oval in horizontal cross-section and basin-shaped in vertical profile. It is overlaid by ash lenses and Stratum II. A large limestone rock, with a natural (metate-like) depression, was positioned between the hearth and the northwestern edge of the burial pit (Feature-6).

The hearth was also circumscribed by limestone and igneous rock fragments around its wall and base. It was initially thought that since Feature-6 (tomb fill) was laden with organic and animal 'food' remains, then the backfill was probably the result of a funeral food feast to which the cooking activities in hearth Feature-7 would be directly associated (Oliver et al. 1999). However, two 14C assays (GrN-24767, 24769) from this hearth feature (cal. AD 890) indicated that the hearth is earlier than the burial and backfill events (Table 1). A charcoal (GrN-24768) from the ash lens right on top of this hearth dated to cal. AD 1025. The AD 1170, or later, date for the burial fill (Feature 6) is relatively contemporaneous with the cal. AD 1025 date from the ash lens date overlaying hearth Feature 7.

Feature 4, Units 2-3 (N51-W52, N-52-W52). At first glance it appears to be yet another hearth of an irregular oval shape in planview and squarish in profile. The feature cut through the hard calcite/stalagma floor into the underlying hard clay. A large, water-worn, smooth, oval manuported igneous stone was placed at the center resting directly on the clay. The rock and basin were then filled with a very fine, powdery pink-gray ash largely devoid of wood-charcoal fragments, ecofacts, and artifacts. However, the underlying clay did not show evidence of thermal alteration. These observations suggest that cold ashes were (ritually?) disposed in a basin containing an intentionally placed river rock. Is this feature related to an unknown ceremony with religious connotations? We cannot know, but this feature is closest to the area of highest concentration of petroglyphs in the cave. At the edge of this feature, associated with the surrounding Stratum II (base) deposit we obtained a date of cal. AD 1260, which overlaps the date from Stratum II sealing the tomb fill (Feature-6). An AMS charcoal sample taken above Feature 4, at the interface of Stratum I/II, yielded a modern date (Table 1).

Feature 11, Unit 5 (N52-W52). This feature is a distinct circular basin filled with dark soil and some charcoal which dated to cal. AD 1430 (1450) 1620. It is not a tap root or animal burrow, albeit its function is as yet undefined. No artifacts were recovered from within the feature. The possibility that this feature dates to proto-historic Taíno (Capá) times would suggest that long after the petroglyphs were engraved and after Ostionan Ostionoid individuals were buried there, the cave still retained a numinous aura—an abode of petroglyph-cemís carved by ancestors— for its latest visitors/users. It is worth emphasizing, however, that no Capá style artifacts were detected anywhere in this cave, and that none of the burials or isolated human bone discards can be pegged to Period IVa. Yet, the probable presence of later Capá period visitors, although 'invisible', is indicated by this anthropogenic Feature 11. There appears to be a hiatus in the record between circa AD 1450 and the late XIX Century (and modern) visits to the cave. The '1881' graffiti (Figure 2) alongside liquor/wine bottles, pig bones (MNI=8) and a hearth (Chamber 'B') attest to late colonial and recent interventions.

In short, the period of most intense activity within the cave can be framed between AD 890 and AD 1300 and associated with 'modified' Ostiones artifacts. The earliest human presence (AD 890) in the cave relates to a hearth and cooking activity at the entrance of the cave, perhaps associated to rituals engaging the carving and 'veneration' of the numinous petroglyphs, but not yet to human burials. It is possible that also an Ostionan version of the Taínan cohoba ceremony would have been conducted, but as yet, no medicinal or psychoactive plant remains have been identified. Around AD 1170, Individual No. 1 was buried and, seemingly, accompanied by two dismembered bones with peri-mortem traumas (sacrifice?). Abundant faunal remains and charcoal in Stratum II (AD 1200-1300), suggest that edibles that included animal meats were prepared and consumed during and after the burial rites. In short, the edible meats were probably linked to ritual food-feasting conducted during the funeral rite and periodically continued later as part of the cult to ancestors, which most likely included the numinous petroglyphs. Trampling and other post-burial activities resulted in a palimpsest that during excavations we recognized as Strata I and II. In some of the Units (e.g., 6, 10) isolated (seemingly unimportant) human bones—phalanges, ribs, and vertebras— were found

in Stratum II. These are without a doubt intentional disposals since the rest of the body parts were neither buried in this cave, nor could they be the result of disturbances of earlier burials. The exact same practice of an apparent random human bone element disposal has recently been ascertained by us at another Ostiones period burial cave site, Cueva de Los Muertos-2 (SR-1), further north of Cag-3. This Oliver finds to be a significant in that it does suggest the possibility that an individual may be buried in (lay claim to) various final resting locales at once—in various caves linking sources of ancestral origin, and also be 'curated' inside a basket for veneration by his/her living descendants back home.

It is clear that Cag-3 is not the locus for quotidian, everyday, domestic activities. Therefore, any food animal (and plant) remains found in this cave can be safely assumed to be ingredients of recipes that relate to food feasts and meals prepared and consumed in a religious-ceremonial context. Certainly one of these contexts involves burials and ancestors; another involves the rituals in which petroglyph images are engaged (perhaps cohoba?), and still others would relate to the mysterious 'cold-ash' pit (Feature 4). However one looks at it, food remains at Cag-3, while they certainly contribute nutrients to the indigenous diet, are best viewed as edibles prepared with rituals and ceremonies in mind and not as merely 'subsistence' meals. There is no a priory reason that religious-ritual food remains found by archaeologists would have to be different or distinct from every day food remains. The actual animal bones tell us little about the recipe of the meal or edible served, the etiquette of presentation and consumption, or of the values attached and symbolism involved in the food-feast. However, the abundant presence and selection of food remains in this cave that are at the same time absent or exceedingly rare in the refuse midden of residential sites should provide a first step in exploring such issues as ritual/ceremonial foods, animal/plant taboos, or perhaps even about contrasting combinations of edible ingredients that are permissible in one context but not in others. If in addition we could pinpoint food items as indicators of prestige, status and luxury, then we would have clues as to the social agents, such as behiques and household heads, that might be present or led ritual celebrations, such as a funerary feast.

Excavations at finca de Doña Rosa (Utu-44)

Site Utu-44 is here considered to be a habitation locus, similar to site Utu-27 reported in this volume by Rivera and Oliver. Utu-44 has a batey or plaza area located on a flat-top ridge and a single, refuse deposit that was dumped downslope to the west (Figure 5). The midden is an elongated, oval-shaped deposit (8 x 15 m) estimated to cover a maximum 120 m2 in area. Given that only one relatively small midden is located at Utu-44, it may be inferred that this was a homestead for not more than one or two families at any one point in time, rather than a village (multi-house/midden) site. To the east of Utu-44 the terrain slopes toward the Tanamá River. To the west, at the base of the slope a (now blocked) is a small drainage, beyond which a series mogotes arise. The mogote where Cag-3 is located is within sight (south of) the ridge-top, as is the 'vacant' ball court, Utu-53, to the east across the river. Just 2.1 Km to the south, following the alluvial terrace of Río Tanamá, the route leads to the civic-ceremonial center of Caguana (Utu-10).

In 1998, a 14 meter trench was excavated from near the center flat ridge-top (at N1000-E1000) and across the midden to coordinates N1000-E 986 (midway downslope). This trench is divided into Trench A, the segment on the ridge-top, and Trench B, the segment intersecting the midden downslope (Figure 5). At the edge, between the beginning of the midden and the ridge-top (Unit N999-E992), there was evidence of where the western row of monoliths of the batey was once located. Several igneous monotlihs and limestone slabs of this batey (lacking petroglyphs) had also been dumped at the bottom of the slope in recent times (we thin in 1995-6). The eastern batey row no longer exists since it was impacted by a dirt-road. The zooarchaeological data used here to compare with Cag-3 includes only those samples that were troweled and handpicked in situ during excavations. Bulk midden soil (of 3-5 Kg) unscreened samples, collected for controlled

waterscreening (through different-sized mesh grades) in the laboratory, have yet to be fully sorted and processed. Despite using a biased sample, initial comparisons between hand-picked (biased) and control samples already wet-screened and sorted do not (yet) indicate any significant differences in terms of range of species, element counts, and presence/absence in mesh fractions of 1/4" or greater.

The stratigraphy of the midden from Trench B is relatively simple (Figure 6). Stratum I consists of a relatively deep plow-zone (Ap Horizon), characterized by a dark brown clayey soil with a high density of cultural materials, including charcoal, lithics, ceramics, and abundant landsnails. The dominant landsnails are the Megalomastoma croceum, Pleurodotone caracolla and Pleurodonte marginella, all three of which are also equally if not more abundant in Cag-3. The ceramic materials from Stratum I are a mixture of Ostiones and Capá styles, as a result of plowing. Stratum II, also clayey, has a distinctive lighter and reddish-brown color that is only present on the down-slope portion of Trench B. This layer contains far less amount of (dark) organic matter and cultural materials than either Stratum I or Stratum III. Rivulets of landsnails and other light-fraction elements, and clusters of heavier fraction materials, show patterns of drainage consistent with relatively rapid downslope displacement. The lighter coloration (less organic) indicates that clayey (Stratum IV) sources from the ridgetop were displaced downslope as a result of precipitation. We interpret Stratum II to have been formed in a period immediately after the flat-top ridge was deforested. It is probable that deforestation is at least in part due to leveling the ridge for the construction (or expansion?) of batey or plaza. The underlying Stratum III, like Stratum I, is a dark-brown clayey midden with a high content of organic materials as well as ecofacts and artifacts. It represents the initial accumulation of garbage at this site, at a time prior to the erosion episode marked in Stratum II. The downslope extent of Stratum III is more limited; it is absent from the westernmost excavated unit toward the lower part of the slope. The base (Stratum IV) consists of of a culturally sterile clay. Trench A only includes a (modern) plowzone underlain by Stratum IV. This zone, nearly devoid of artifacts and ecofacts, is most likely to be the plaza and/or ballcourt area of the homestead site. In both Stratum II and III the ceramics are predominantly 'modified' Ostiones. There are exceptions, as a relatively small number of sherds are diagnostic of later Capá style. However, we are reasonably confident that most of these exceptions were the result of a root intrusion and Feature-15.

Table 2. Radiocarbon Dates from Utu-44

Lab Sample GrN-#	Unit N-W (m above sea level)	Taxon Charred wood	Radiocarbon years BP (before present)	Calibrated AD Date (2 _)
24757	999-988 (98.63 m)	Sapotacea cf. Manilkara	760±70	1170 (1280) 1390
24758	999-988 (98.50 m)	Wood taxon #3	680±50	1270 (1300) 1400
24762	999-990 (98.71 m)	Wood taxon #4	880±40	1040 (1180) 1260
24763	999-990 (98.71 m)	Wood taxon #7	860±40	1050 (1210) 1280
24762+ 24763 (∑)	*999-990 (98.71 m)*	*Undient. Wood charcoal*	*870±29*	*1050 (1200) 1250*
24761	999-991 (98.97 m)	Cf. Sterculaceae	900±60	1020 (1170) 1280
24760	999-990 (99.03 m)	Unident. Wood charcoal	600±40	1300 (1330) 1420
24759	999-991 (99.08 m)	Miraceae cf. Cecropia	970±30	1010 (1032) 1160

Wood taxa identification by L. A Newsom. Radiocarbon dates processed by the University of Groningen, Holland. . Assays GrN-24762 and 24763 are statistically the same at a .95 level of confidence. The summed (∑) date is provided. All calibrated dates are rounded off to the nearest decade as suggested by Reimer et al (1998).

Stratum III, dates to cal. AD 1010-1280, with median dates of cal. AD 1030, AD 1170, and AD 1200 (Table 2). A single date of cal. AD 1300 (1330) 1420 was obtained at the level of Stratum III, but close to a root feature. We believe that the cal. AD 1300-1420 date belongs to charcoal coming from the base of Stratum I into Stratum III, pushed by the tree-root. Two other dates, cal. AD 1280 and cal. AD 1300 were taken from the bottom third of Stratum II. They mark a period of slope-wash erosion in this midden—facilitated by deforestation and batey construction. Incidentally, cal. AD 1280 is also the date for the burning of the structures on the northwest area of the main plaza in Caguana, in order to make room for the oval plaza (Oliver 1998). No dates from Stratum I have been submitted, as these would be unreliable due to mechanical admixtures through plowing.

Stratum III should date post- AD 1300 and perhaps extend to AD 1400-1450. At 2 sigma, there is some overlap among the dates obtained from the two lower strata. But, at the very least, it can be argued that the deposit represents some 300 years of continual deposition—arrested only during the erosion episode represented in Stratum II, which nevertheless still contained a fair amount of refuse.

The midden deposits at Utu-44 can be reasonably interpreted as representing the refuse or disposal of two broad-ranging types of activities. On the one hand the midden includes the garbage generated by variety of quotidian and domestic activities. On the other, it also contains refuse from sacred as well as profane activities that took place in the open plaza or batey. Undoubtedly, some of these homestead-level public activities would be secular and quotidian while others would be periodic and sacred rites/ceremonies (e.g., local ballgames, homestead-level areítos). Most, if not all, of the refuse generated from all sorts of activities—scared-profane, periodic-quotidian, informal-ceremonial—would be expected to have ended up in this midden, as this is the only midden for this locus. It is extraordinary—to us anyway—that for at least 160 years (AD 1170-1330), but more likely for 300 years, the refuse generated was studiously dumped on the same tightly circumscribed area downslope. This signals strong degree of continuity regarding proper (or obsessive compulsive?) behavior in the disposal of garbage. Despite obvious differences, the span of occupation, from about AD 1170 to circa AD 1330/1450 overlaps the period of intense activity at Cag-3.

The Zooarchaeological Data

The zooarchaeological samples (excluding terrestrial mollusks) are here discussed at the whole site level, rather than by unit/level/feature/context. Inevitably, some resolution will be lost. However, this coarse-level still reflects the overall (accumulated) differences between a specialized ritual/ceremonial locus (cave Cag-3) and a habitation site with a batey. Both sites show the dominance of terrestrial (including riverine) fauna over marine and coastal/estuarine animal resources. At Cag-3, of the total of 3522 elements and 791 MNI, fully 98.73% were terrestrial or fluvial. At Utu-44, of the total 1158 elements and 166 MNI, fully 86.14% were terrestrial or fluvial. Even so, most of the marine specimens were not imported as food resources, but primarily as raw materials for manufacture or use (in the case of bivalves) as scrapers. Due to space limitation, we shall first provide a quick run-down of the taxa encountered at each site and conclude with a more detailed discussion of the taxa most relevant to the issues raised in this essay.

At Utu-44, Strombus costatus, Strombus sp., Cyparea zebra, Lucina pectinata, and Codakia orbicularis totaled only 17 MNI, with Codakia being the most abundant (MNI= 11). But in Cag-3 the MNI is 5, represented by one Columbella mercatoria, one Lucina pectinata and two Codakia orbicularis. Marine and river fish remains are neither present at Utu-44 (though this may change once we process the bulk soil samples) nor at Cag-3 (the latter is a definitive absence). The only other marine specimens are of the Quelonidae family (MNI=4) and found only at Utu-44. Although coastal contacts are indicated at Utu-44, the flow of coastal/marine resources is, indeed, quite limited and narrow. Somewhat more frequent (MNI=7) is the freshwater turtle or hicotea (Trachemys stejnegeri) found only in site Utu-44. Six different amphibian and reptilian taxa have been identified. The boa snake (Epicrates ornatus; MNI=4) was only found at Cag-3. The Annolis sp. (MNI=2) and Lacertilia (Ct=1 MNI=0) lizards as well as the Peltraphryne sp. frog (MNI=2) were found only at Utu-44. The siguana (Ameiva exul) was found in both sites: Cag-3 (MNI= 2) and Utu-44 (MNI=3). The snake Alsophis portricensis was also found in both sites: Cag-3 (MNI=2) and Utu-44 (MNI=4).

As usual, the great majority of avian bone elements remained unidentified (Utu-44 Ct=39; Cag-3 Ct.=46). Interestingly, only the pigeons (Columba sp.) are found in both sites (Utu-44 MNI= 4; Cag-3 MNI=6). Exclusive to site Utu-44 are the duck (Annas sp.; MNI=1), the mozambique passeriform bird (Quiscalus niger bracheryptus; MNI=1) and the guaraguao vulture (Buteo jamaicensis; MNI=1).

Instead, the turtledove, Zanida aurita zenadia (MNI=3), is exclusive to Cag-3, one of which has clear burn marks. Thus, other than Columba sp., there is little overlap between the two sites, albeit the large number of unidentified bird bones demands caution before reaching any conclusions.

Perhaps the most interesting discovery made by Narganes is the identification (only at Cag-3; MNI=1) of the musaraña (Nesophontes edithae). This is the first hard evidence for the presence of this insectivore in the mountainous interior of the island. Not long ago it was assumed that this animal was already extinct prior to the arrival of the first humans to Puerto Rico. Equally telling is the presence, also at Cag-3, of a mandible fragment (MNI= 1) of the rodent Heteropsomys insulans, a very rare species in late prehistoric contexts, yet more ubiquitous in Huecoid and early Saladoid contexts (e.g., Narganes 1982, 1985).

The Evidence for Animal Staple Foods and Ritual Edibles

Of all the animal taxa listed above, one in particular stands out as an the best candidate for a specialized ritual 'meat' associated with funerary ceremonies, veneration of ancestors, and/or rituals engaging the numinous petroglyphs. That is the buruquena or river crab. Other fauna that show interesting but not as clear-cut possibilities (e.g., the boa) will have to await another opportunity.

The Buruquena. The Epilobocera sinuatifrons today mates and reproduces in clear-water streams flowing into the Tanamá River. They can also be found frequently in karst wetland habitats (known as furnias). They may also move overland from stream to stream or stray around furnias. Today they are searched from under rocks in the streams, particularly in river pools, and captured by hand (Figure 7). No special traps or equipment are used, except a receptacle to hold and transport the (live) captured animals. Archaeologically, only the claws preserve, as the carapace (chitin) is too fragile, for which reason sexing the specimens is not possible. The table below quite unambiguously underscores the magnitude of the differences in both number of elements (Ct) and minimum number of individuals (MNI).

Table 3. River Crab/Buruquena Element Counts and MNI

No.	Taxa	Spanish vulgar name	Cag-3 Ct	Utu-44 Ct	Cag-3 MNI	Utu-44 MNI
33	*Epilobocera sinuatifrons*	buruquena (river crab)	2390	3	692	1

The argument that this is due to differential preservation, at the moment, is not particularly strong. Site Utu-27, is only about 2 Km southeast from Utu-44. Their midden deposits share the same overall environmental characteristics and suffer similar effects of climate, have similar midden soil types, moisture and high alkalinity. Moreover, both were also excavated and sampled using the same methodological approach. The only difference is temporal and cultural: site Utu-27 dates between ca. AD 1300-1450 (Capá). Yet preliminary counts of buruquena already amount 102 MNI (70% of all taxa excluding mollusks) and was, like Utu-44, obtained from only the handpicked (biased) sample.

Given the above discussion, we propose that between AD 900-1300 (Ostiones-Period IIIb), the over-abundance of buruquena reflects a specialized meat consumption in ritual food-feasting ceremonies (burials, ancestors, petroglyphs) at Cueva de Juan Miguel. In contrast, crabmeat consumption was exceedingly rare in the contemporaneously occupied residential site of Utu-44. Perhaps the crab's presence was incidental. If so, one might argue either some sort of prohibition or restriction of crab meals and its prescription for certain religious rites. The data from the post AD-1300 Capá period habitation site suggests that by this time buruquena meat consumption was no longer restricted to ritual cave contexts. The restriction or prohibition was lifted. Alternatively, if it turns out that other Ostiones habitation sites—yet to be excavated in this area—show similar MNI frequencies to either Utu-27 (habitation MNI=106+) or Cag-3 (cave ritual MNI=692),

then Utu-44 would be the odd-one out. Even so, it would still imply that there was a significant food restriction or avoidance involved for reasons that would also need explanation. If Utu-44 turns out to be such an exception, it may well be that the reason(s) are not so transcendental but mundane, even trivial; e.g., local residents of this small home/farmstead simply abhorred buruquena meat the same way one of us (Oliver) hates broccoli!

However, as things stand, we find the buruquena avoidance at Utu-44 and its specialized ritual use at Cueva de Juan Miguel (Cag-3) a plausible explanation for the sharp differences in MNI. But it will remain a just-so explanation until it is confirmed by repeated occurrences throughout this region (i.e., that there is a pattern and a norm) or until Utu-44 is proved to be an exception to the norm.

The Hutía. The hutía is quite interesting since it is a keystone meat resource among groups, especially if the 'absence' of marine or river fish remains in the region of Caguana is real rather than apparent. Yet it is well represented in almost all the excavated levels at both sites. While in both sites there is a clear preference for adult hutías, there is a higher proportion of juveniles represented in site Utu-44 (19.62%) than at Cag-3 (6.25%). Perhaps the hutía meals consumed in the ceremonial feasts at Juan Miguel cave required larger adult animals; whereas, at the habitation locus, a wider age-range was acceptable or tolerable for everyday meals. It could also be that the higher frequency of juveniles at Utu-44 would be expected if these were kept live, in captivity, for later consumption around the homestead. Still, why mostly adult hutías were found in the funeral cave?

Table 4. Hutía Element Counts and MNI

No.	Taxa	Spanish vulgar name	Cag-3 Ct	Utu-44 Ct	Cag-3 MNI	Utu-44 MNI
12	*Isolobodon portoricensis*	hutía [rodent, extinct]	283	900	48	107

Overall, it is clear that the hutía was consumed in numbers at both sites, but with an expected higher MNI frequency coming from the habitation site, as shown in Table 4.. Hutía meat, in and of itself, was not uniquely restricted to cave (Cag-3) ritual feasting, even though perhaps the recipe for preparing, serving and consuming hutía may have been quite different from that back at home. One might conclude that if any differences existed between ritual edibles and /staple meals, these would not be because of the animal's meat per se (it was not prohibited or restricted in either context), but because of the recipe (ingredients) involved, its preparation, mode of presentation and/or consumption of a particular hutía 'dish'. This is why, the better candidate for a strong correlation with exclusive ritual edible is the river crab. It is this crab that is already exclusive, regardless of how its meat was prepared, presented, and consumed.

This essay ends with bats, as these loom large in Taíno mythology and symbolism. Could any be considered as a special 'ritual' food?

The Bats. Of the five taxa identified, only E. wetmori and B. cavernarum are found in both sites, although the latter has an expected higher frequency of MNI in Cag-3 (Table 5). M. blainvilli is restricted to Cag-3, whereas A. jamaicensis is represented only at Utu-44. Narganes suggests that while an incidental presence of bats in caves is to be expected, their presence in the midden at Utu-44 could be the result of bats being consumed during rare, probably ceremonial-religious, events. The very low MNI might also indicate that in both sites, bats were very sporadic, rarely prepared into edible delicacies, whether for ritual or other purposes—assuming that their presence is not incidental. However, one of these bat species at Utu-44 is frugivorous, which may indicate that in or around this midden there may have been fruit bearing trees—as might be expected in a tropical house garden.

Table 5. River Crab Element Counts and MNI

No.	Taxa	Spanish vulgar name	Cag-3 Ct	Utu-44 Ct	Cag-3 MNI	Utu-44 MNI
3	*Mormoops blainvilli*	murciélago canela	1	0	1	0
4	*Stenodermidae*	murciélagos nariz de hoja	5	14	5	7
5	*Brachyphylla cavernarum*	murciélago cavernícola	11	3	5	1
6	*cf. Brachyphylla cavernarum*	Cf. murciélago cavernícola	1	0	1	0
7	*Artibeus jamaicensis*	murciélago frutero	0	1	0	1
8	*cf. Artibeus jamaicensis*	Cf. murciélago frutero	0	2	0	1

Overall, the evidence for bat consumption here is not strong. Bat bones are indeed very fragile and systematically underrepresented for most sites, caves included. At least, in Cag-3, bat bones did not show any particular distribution, concentration, or association to features, that would suggest ritual use. The bones preserved also lacked clear human-made fractures and cooking/burn or use marks.

Much work yet remains to be done, but hopefully the Utu-44/Cag-3 comparative analysis will stimulate further research and discussion on this topic of ritual edibles vs. quotidian meals in the Caribbean.

Acknowledgements

We wish to thank the Institute of Archaeology-University College London, Programa de Arqueología y Etnohistoria of the Instituto of de Cultura Puertorriqueña, British Academy and Consejo para la Protección del Patrimonio Arqueológico Terrestre de Puerto Rico. Students from the University of Puerto Rico, University College London and University of Leiden-Holland participated in the excavations at both sites. We are grateful to Guy Weaver for directing the 1998 excavation at Cag-3. Lee A. Newsom identified the wood specimens, and Dr. Edwing Crespo performed the analysis of human remains from Cag-3 site. Juan Rivera co-director with Oliver of the Utuado-Caguana Archaeological Project was involved in all aspects of the work that led to this paper.

References Cited

Alegría, Ricardo
1983 Ball Courts and Ceremonial Plaza in the West Indies. Yale University Publications in Anthropology, No. 79. New Haven: Department of Anthropology, Yale University.

Cassa, Roberto
1974 Los taínos de La española. Santo Domingo, República Dominicana: Editora de la universidad Autónoma de Santo Domingo.

De France, Susan
1990 Zooarchaeological investigatios of an early ceramic age frontier community in the Caribbean: The Maisabel Site, Puerto Rico. Antroplogica No. 72-74: 3-180. Caracas: Instituto Caribe de Antropología y Sociología-Fundación La Salle.

De France, S. W. F. Keegan and L. A. Newsom
Ms1995 The Archeobotanical, Bone Isotope and Zooarchaeological Records from Caribbean Sites in Comparative Perspective. Unpublished manuscript. Florida Museum of Natural History, Gainesville.

Gosden, Christopher y Jon. Hather (editors)
1999 The Prehistory of Food; Appetites for Change. London: Routledge.

Las Casas, Fray Bartolomé de
1929 Historia de Las Indias. 3 Vols. Edition and prologue by Gonzalo Reparaz. Madrid: M. Aguilar. Lugo, Ariel, L. Miranda Castro, A. Vale, T. López, E. Hernandez Prieto, A. García Martinó, A. R. del Puente Rolón, A. G. Tossas, D. A. McFarlane, T. Miller, A. Rodríguez, J. Lundberg, J. Thmolinson, J. Colón , J. H. Shellekens, O. Ramos and E. Helmer
2001 Puerto Rican Karst—A Vital Resource. United States Department of Agriculture, Forest Service. General Technical Report WO-65.

Narganes Storde, Yvone
1980 Vertebrate Faunal Remains from Sorcé, Vieques, Puerto Rico. Unpublished Masters thesis, Department of Anthropology, University of Georgia, Athens.
1982 Restos faunísticos de vertebrados de Sorcé, Vieques, Puerto Rico. Proceedings of the X International Congress for the Study of Pre-Columbian Cultures of the Lesser Antilles, edited by L. Allare and M. Mayer, pp. 251-264. Montreal, Canada: Centre de Recherches Caraibes de la Université de Montreal.

1993 Los restos faunísticos del sitio Puerto Ferro, Vieques, Puerto Rico. Proceedings of the XIV International Congress for Caribbean Archaeology, edited by A. Cummings and P. King, pp.94-114 Barbados Museum and Historical Society-IACA.
Newsom, Lee A.
1995 Mangroves and Root Crops: The archeobtanical record from En Bas Saline, Haiti. Proceedings of the XVI International Congress for Caribbean Archaeology, edited by G. Richard, pp. 52-66. Basse Terre, Guadeloupe: Conseil Régional de la Guadeloupe, Mission Archeologique et du Patrmoine.
Oliver, José R.
1998 El Centro Ceremonial de Caguana, Puerto Rico: Simbolismo iconográfico, cosmovisión y el poderío caciquil taíno de Borínquen. British Archaeological Reports International Series No. 727. Oxford, Inglaterra: Archaeopress.
Oliver, José R., Lee A. Newsom and Juan Rivera Fontán
1999 Arqueología del Barrio Caguana, Puerto Rico. Trabajos de Investigación Arqueológica - Tercer Encuentro de Investigadores. Editado por J. Rivera Fontán, pp.8-26. Publicación Ocasional de la División de Arqueología-Instituto de Cultura Puertorriqueña. San Juan, Puerto Rico: ICP.
Reitz, Elizabeth J. And Elizabeth S. Wing
1999 Zooarchaeoloy. Cambridge Manuals in Archaeology. United Kingdom: Cambridge University Press.
Hugh Jones, Christine
1979 From the Milk River: Spatial and Temporal Processes in Northwestern Amazonia. Cambridge: Cambridge University press.
Hugh Jones, Stephen & Christine Hugh-Jones
1993 The Storage of Manioc product and its Symbolic Importance among the Tukanoans. Tropical Forests, People and Food: Biocultural Interactions and Applications to Development. Man and the Biosphere Series, Vol. 13, edited by C. Hladik, A. Hladik, O. F. Linares, H. Pagezy, A, Semple, and M. Hadley, pp. 589-94. United Nations Educational, Scientific and Cultural Organization, Paris. New York: Parthenon Publishing Group.
Miracle, P.y N. Milner (editores)
2001 Consuming Passions and Patterns of Consumption. McDonald Institute Monographs. Cambridge, UK: Oxbow Books.
Wing, Elizabeth
1991 Economy and Subsistence I. Prehistoric Barbados, edited by P. L. Drewett, pp. 134-152. London: Institute of Archaeology, Archetype Publications..
1993 The realm between wild and domestic. Skeletons in her cupboard, edited by A. Clason, S. Payne and Hans-Peter Uerpman, pp. 243-250). Oxford, England: Oxford University Press.

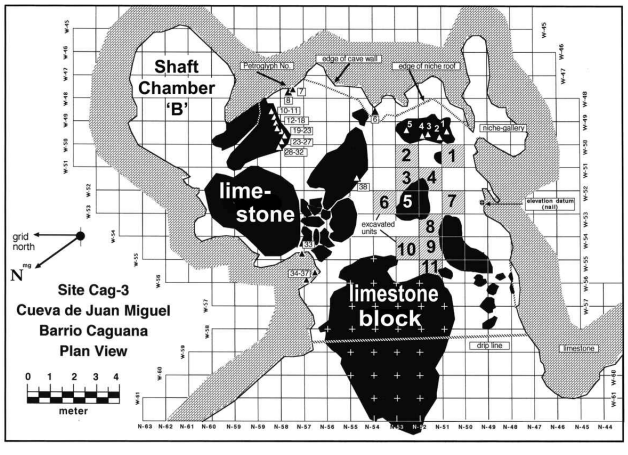


Figure 1. Plan view of Cueva de Juan Miguel showing location of petroglyohs and excavation Units 1-11.

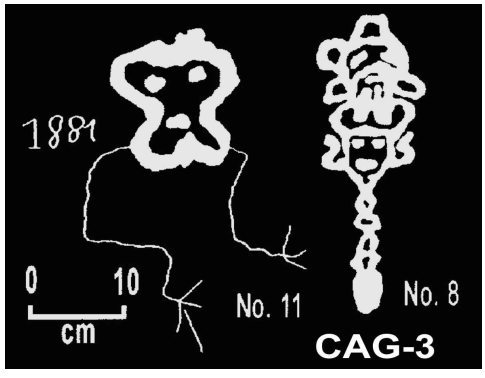


Figure 2. Grafitti of a date (1881)
Petroglyph Nos. 11 and 8

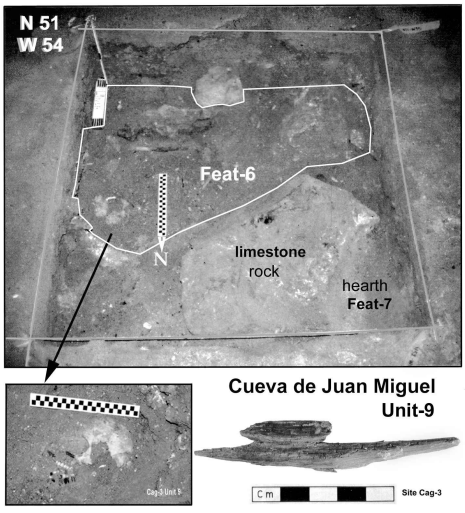


Figure 3. Top: Unit-9 showing Feature-6 burial of Individual No.1 and Hearth Feature-7. Bottom: Close up of the cranium and a unique wood artifact of unknown function, from Stratum II, above the burial fill.

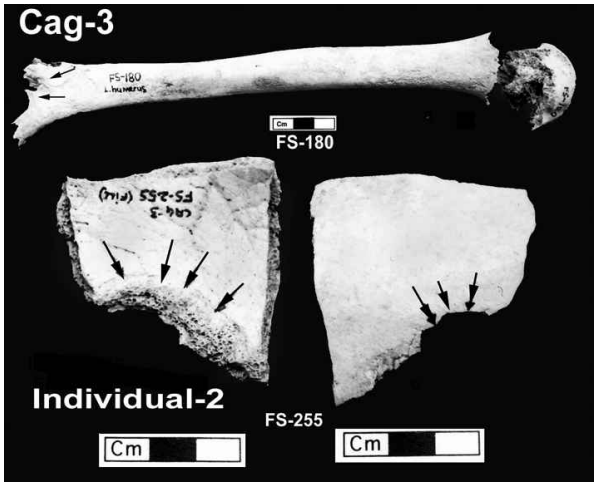


Figure 4. L. humerus and interior/exterior skull fragment showing (arrows) peri-mortem trauma.

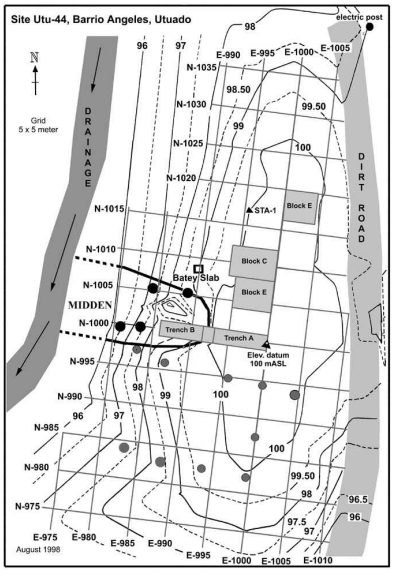


Figure 5. Topographic map of site Utu-44 (Finca de Doña Rosa). Grid: 5x5m.

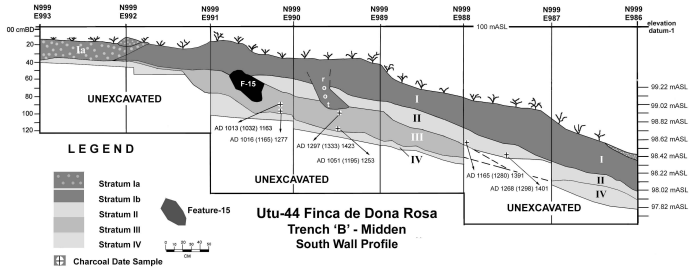


Figure 6. Stratigraphic profile of Trench 'B'. Between E-992 and E-991 evidence of the batey row was found.

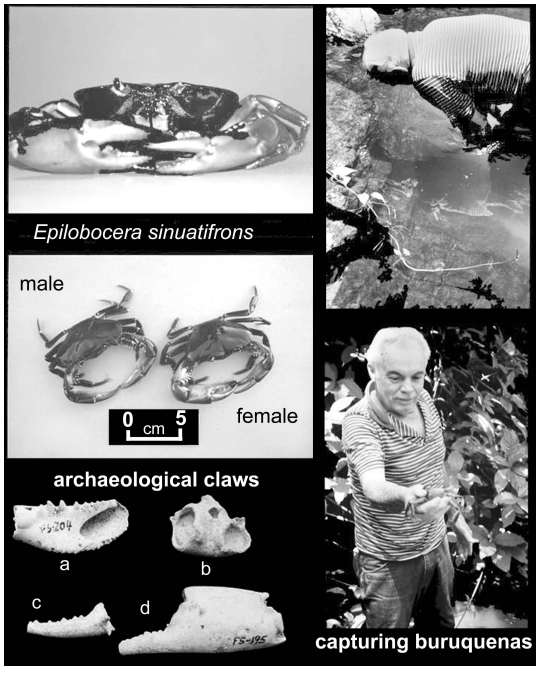


Figure 7. Left: Live buruquena crabs and archeological specimens. Right: Sixto Bérmudez capturing bruquenas in an affluent of Río Tanamá.