PROCEEDINGS
OF THE
FOURTH SYMPOSIUM
ON THE
NATURAL HISTORY OF THE BAHAMAS

Edited by
W. Hardy Eshbaugh

Conference Organizer
Donald T. Gerace

Bahamian Field Station, Ltd.
San Salvador, Bahamas
1992

Printed in USA by Don Heuer

ISBN 0-935909-41-9

FUEL WOOD SELECTION AND THE LUCAYAN-TAINO LANDSCAPE: A PRELIMINARY VIEW

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ABSTRACT

Many of the factors producing the charcoal assemblage from the Three Dog Site, San Salvador, Bahamas, will be reviewed. These reflect prehistoric patterns of selection and use, archaeological recovery techniques, varying preservation biases, and post-depositional disturbances. The identified woody taxa contribute to assembling a preliminary picture of the floristic environment of San Salvador during its initial colonization. The charcoal assemblage from the earlier component of the site, dating to 1290-1085 BP (A.D. 660-865) will be discussed here.

INTRODUCTION

Charcoal recovered from archaeological sites is an analytic means of reconstructing patterns of cultural adaptation and prehistoric floristic environments. Like the study of other kinds of prehistoric plant remains, it must be used cautiously, since there are many factors which produce an archaeological wood assemblage (Lopinot, 1984; Miksicek 1987; Pearsall 1989; Popper 1988; Smart and Hoffman 1988). The archaeologist and paleoethnobotanist observe materials which reflect prehistoric patterns of selection and use, archaeological recovery techniques, varying preservation biases, and post-depositional disturbances. The selection of specific types of woods is based on, but not limited to, intended use, availability, transport technology, ease of collection, technology, physical properties, form, size, and cultural beliefs. The preservation of charred wood is dependent upon its physical properties, amounts, post-depositional disturbance, patterns of refuse disposal, soil chemistry, and quantity of remains. Furthermore, the recovery of charcoal assemblages reflects sampling and varying archaeological recovery strategies. Finally, the manner in which plant remains are curated and studied affects identification and interpretation.

In this paper, the charcoal assemblage from seven 1 x 1 m. squares excavated between 1984-1987 from the Three Dog Site (SS21), San Salvador, Bahamas, will be interpreted in reference to several of the factors which produced it. The excavation of the Three Dog Site is part of a long-term research project known as the Lucayan Ecological Archaeology Project (L.E.A.P.), focused on understanding Lucayan-Taino adaptations to their island ecosystems (Berman and Gnivecki 1990). Excavation of the site began in 1984 and continues to the present.

THE SITE

The Three Dog Site is located on Sugar Loaf Bay on the west side of San Salvador. Two occupations are known. One, based on the presence of a lead arquebus ball and an assemblage of non-diagnostic metal artifacts in the upper layers of the cultural stratum, dates to the historic period and is, therefore, one of two known Spanish Contact period sites on the island. (The other is the Long Bay Site currently being excavated by Charles Hoffman (1987). The earlier occupation was identified from the pottery, one thermoluminescence and three radiocarbon dates. It dates to 1290-1085 BP (A.D. 660-865), and is the earliest known prehistoric site thus far excavated in the Bahamas. The paper focuses on the older occupation, representing the period of early colonization of the Bahamas islands.

The site consists of the remnants of one, and possibly two, households. There is a midden, a food processing area, a pendant-making toolkit, and another activity area which has not yet been defined. Much of the seaward facing portion of the site has eroded away due to active storm action; consequently, we do not know how large the community was when it was inhabited. The food processing area, located in the southern portion of the site, is characterized by a spatially discrete configuration of partially reconstructible vessels and coral tools showing evidence of use. The midden, situated in the northern part of the site, was recognized on the basis of a high density of broken artifacts (sherds, shell, coral, shell beads), a variety of faunal remains (bone, otolith, carapace, scales), and concentrations of charred wood and ash. Eleven taxa of fish and three species of turtle (including a fresh water variety) have been identified from four squares in this area (Wing, personal communication 1991). The density of charcoal was greater here than at any other part of the site.

RECOVERY AND IDENTIFICATION OF PLANT REMAINS

The recovery, analysis, and interpretation of plant remains is an integral part of the research design at the Three Dog Site and includes the identification and interpretation of macrobotanical, pollen, and phytolith remains (Berman, Pearsall and Gnivecki 1988; Berman and Gnivecki 1990). Soil samples for botanical study are taken from the occupational level in each excavated square, as well as from the levels above and below it. Off site samples have also been taken. Macrobotanical remains are recovered from *in situ* contexts, screens (screen mesh size = 1/16 inch or 1.6 mm) and flotation. Although they do not preserve well in the high alkaline soils typical of sediments of the Three Dog Site, phytolith and pollen samples are, nevertheless, taken. While phytoliths were found in two exploratory samples, they were non-diagnostic (Pearsall 1989a). Dr. Thomas Wilson of Miami University of Ohio is currently assessing the degree of pollen preservation in several soil samples.

This paper focuses on the charcoal assemblage representing all of the *in situ* and screen charcoal recovered up to and including the 1987 field season. Only a portion of the soil samples taken up to this point was processed. Flotation was carried out under the direction of Dr. Richard I. Ford of the University of Michigan at the Bahamas Field Station in January 1987. Identification of the plant materials was performed by Dr. Deborah Pearsall of the University of Missouri-Columbia in 1988 (Pearsall 1989a). Because we had not yet determined what kind of plant recovery methods would be most appropriate for the kinds of sediments and plant remains present at the site, a preliminary system was employed with available materials. Soil was dumped into nested geological screens which were held in a bucket of water. The water was agitated by moving the screens in an alternating clockwise-counterclockwise direction. Plant material was retained in a 1.0 mm mesh screen (light fraction). Although this system allowed us to recover plant remains with little or no loss, only a portion of a soil sample could be processed at one time. A flotation system, which allowed us to treat larger samples in less time, was instituted in 1988 by Dr. Pearsall.

Heavy fractions were hand-sorted in the field, but no plant remains were found. All light fractions were submitted for identification. Two additional samples were processed at the Hartwick College Archaeology Laboratory, Oneonta, New York, in May 1988. No plant remains were retained in the 1.0 mm mesh screen, so the heavy fraction was submitted for analysis.

Pearsall (1989a: 2-4) examined the plant materials from the 1.0 mm mesh screen in their entirety using 10-15 X magnification. The usual procedure of dividing material into size fractions (Pearsall 1989) was not followed, as the samples were too small. The heavy fraction from the Hrtwick College samples were dry-screened in a 2.0 mm mesh screen. All charred plant materials which did not pass through the 2.0 mm mesh sieve was extracted.

A collection of 20 pieces of charred wood was selected randomly from each sample. In cases where samples lacked 20 specimens, all pieces of sufficient size were studied. Thirty pieces from the largest sample were identified, so that the full range of taxa could be observed. Each piece was snapped to expose a fresh transverse section, examined under 15 X magnification, and compared with samples in the University of Missouri-Columbia comparative plant collection.

PLANT REMAINS

The assemblage consisted of 1005 charred wood fragments from eight *in situ* and screen charcoal samples from four excavation squares and eight flotation samples from five squares. Two hundred and thirty two (232) pieces were examined. Of these, 210 pieces were of known wood. Charred masses of fungus spores were also found in some samples, but not analyzed. Pearsall (1989a: 5) suggests that these were probably introduced into the deposits. The following species were identified: *Erythoxylon* sp., *Conocarpus* sp., *Guaiacum* sp., *Croton* sp., and *Exostema* sp. One taxon was not identified.

Paleoethnobotanists employ a number of measures to quantify and interpret plant data (Popper 1988; Pearsall 1989). Like all analytic methods, each varies in appropriateness and power. Miller (1989: 72) has noted that the use of ratios allows samples to be standardized. Thus, samples of unequal size, varying degrees and conditions of deposition and preservation, and differences in material (e.g.,nutshell/charcoal) can be compared. In this study, Pearsall (1989a) employed percentages to account for varying sample size and conditions of deposition and preservation.

The most common wood extracted from the samples was *Erythroxylon* sp., a member of the coca family (Erythroxylaceae), represented by two species on San Salvador (Smith 1982) and four species on Andros (Nickrent, Eshbaugh, and Wilson 1991). *Erythroxylon* sp. accounted for 74.8 per cent of all identified wood (N = 157). Pearsall (1989a:) noted that the fragments were hard, dense, and difficult to break. There was a good match between the archaeological type and that represented in her comparative plant collection.

Conocarpus sp. constituted 11.9 per cent of the identified wood (N = 25). *Conocarpus* is a genus in the Combretaceae (white mangrove) family, which is represented by four genera with one species each on San Salvador (Smith 1982) and Andros (Nickrent, Eshbaugh, and Wilson 1991).

Guaiacum sp. accounts for 9.0 per cent of the identified wood (N = 19). It is a member of the Zygophyllaceae (lignum vitae) family. Only one species, *Guaiacum sanctum* (lignum vitae), has been noted on San Salvador (Smith 1982) and Andros (Nickrent, Eshbaugh, and Wilson 1991). The archaeological wood was very hard, broke unevenly and contained occasional resinous inclusions in the pores. The match between the archaeological wood and the wood in the comparative collection was excellent (Pearsall 1989a: 11).

Croton sp. constitutes 3.3 per cent of the wood assemblage (N = 7). *Croton* is a genus in the Euphorbiaceae (spurge) family, represented by 16 genera on San Salvador (Smith 1982). Six species are present on San Salvador (Smith 1982), while three species have been observed on Andros (Nickrent, Eshbaugh, and Wilson 1991). The archaeological wood resembled *Croton* and *Savia*, although there was a closer resemblance to the former. Pearsall (1989a: 11) suggests that the wood might be another genus in the Euphorbiaceae family.

Only two fragments, constituting 1.0 per cent of all identified wood, was identified as *Exostema* sp., a genus in the madder family (Rubiaceae). Smith (1982) has identified 15 genera and many species in this family present today on San Salvador. One species is present on Andros (Nickrent, Eshbaugh, and Wilson 1991). The archaeological wood closely resembled *Exostema*, but Pearsall (1989a: 12) suggests that it could be checked for other genera in the family.

An unknown type did not match anything in the comparative collection. The remaining unidentified wood was too fragmentary rendering no match.

DISCUSSION

Use

The samples submitted for analysis came from two features: the midden and the food processing area. All screen-recovered and *in situ* charcoal came from the midden; none was present in the food processing area. This and the absence of screen-recovered bone from these squares suggest that it was a very well-maintained area. The sample consisted of 23 wood pieces from the food processing area; the remainder (283) came from the midden. The specimens were determined to be fuel wood, as no evidence of site-wide or structure conflagration or other processes responsible for producing charcoal is apparent at the site. The charcoal recovered from the food-processing area may have been air-borne from nearby hearths, barbecues, torches, or fields being cleared of its vegetation through the swidden technique. No accidental charring of food is in- dicated in the samples. Interestingly, *Erythroxylon* sp. was the only known wood identified from the food-processing area. The significance of this has yet to be determined.

Fuel can be used for cooking, heating, lighting, flavoring, and the production of smoke to ward off insects. In fact, *Croton* sp. and *Conocarpus* sp. are used as fuel by inhabitants of the West Indies (Little and Wadsworth 1964: 299, 390). I have been told by a number of Bahamians, for example, that buttonwood (*Conocarpus erectus*) is used in outdoor hearths to repel insects. Scarry and Newsom (in preparation) note that fishermen of the Charlotte Harbor and Cedar Key areas (Florida) like to smoke their fish with black mangrove and buttonwood.

Preservation

The preservation of charred wood is dependent upon multiple factors that took place when the charcoal was produced and after the site was abandoned. Factors such as rate of burning, temperature, amount of oxygen, length of exposure to heat, final wood temperature, moisture content, chemical composition, and size of the wood affect carbonization (Smart and Hoffman 1988: 172; Miksicek 1987; Lopinot 1984). For example, ash is produced when there is rapid burning at high temperatures with abundant oxygen (Lopinot 1984). Soil chemistry, floral and faunal turbation, and aeolian and alluvial processes during and after deposition also affect the kinds, amounts, and physical properties of charcoal, as well as other plant remains in the archaeological record (Miksicek 1987). Moreover, the means by which specimens are recovered and curated affects preservation (Miksicek 1987). Although we are paying close attention to these factors (and know, for example, that they affect phytolith preservation), we do not know yet to what degree they have determined how much of or how well the fuel wood assemblage persists through time. So far patterning in the hardness of the wood has been ascertained.

Although other species may have been used to build and maintain fires, only the harder woods that have survived the archaeological record are represented in the fuel wood assemblage at the Three Dog Site. With the exception of *Croton* sp., which is moderately hard (Little and Wadsworth 1964: 508), all of the woods in the charcoal assemblage range from hard to extremely hard (Table 1). (This might explain why *Croton* sp. constitutes a minor portion of the assemblage). Other woods, which were not preserved, might have been used as kindling.

Recovery

Screen size affects sizes and amounts of recovered plant material. A number of investigators have found that smaller mesh sizes employed in screening and flotation insure greater recovery (Pearsall 1989; Wagner 1988). The degree to which the screen sizes employed in plant recovery reported here has not yet been assessed. Comparisons will be made between them and the samples from the flotation system, once the samples from those have been processed and studied.

Factors Arguing For Selection

As anthropology has taught us, native peoples are intimately knowledgeable of their local flora and have devised many economic uses for wood (e.g., Carniero 1978; Smole 1976). Furthermore, according to Ford (1978: 203), cultures have their own systems of classification or folk taxonomy for firewood. Although we cannot reconstruct all the decisions that went into fuel selection at the Three Dog Site, there are a number of factors which help to explain why the woods found in the charcoal assemblage were chosen by the inhabitants of the site. There are also a number of less well understood reasons why they are represented in the proportions we observe.

Physical Properties

Various physical characteristics such as density and presence/absence of resin make certain woods better for fuel. Aboriginal knowledge of such properties might explain why the woods found in the charcoal assemblage were selected for fuel. For example, woods with high specific gravities make the best fuel because they produce more intense heat and burn more slowly and steadily than low density woods (Shelton and Shapiro

Table 1: Relative Plant Hardness and Specific Gravity

PLANT	HARDNESS 1	Specific Gravity
Erythroxylon sp.	hard	heavy
Conocarpus sp.	very hard	1.0 (heavy)
Guaicum sp.	extremely hard	1.2 - 1.3 (heavy)
Croton sp. 2	moderately hard	0.6 (moderately heavy)
Exostema sp.	hard	1.0 (heavy)

Notes:

1. Little and Wadsworth (1964: 210, 390, 214, 266, 508)
2. Croton poecilanthus (Puerto Rico)

Table 2: Tree Diameter and Height

PLANT	TREE DIAMETER 1 (inches)	HEIGHT (feet)
Erythroxylon sp.	2-6	8-20
Conocarpus sp.	8	up to 20
Guaicum sp.	8	15-30
Croton sp.	10	20-40
Exostema sp.	4	10-25

Notes:

1. Little and Wadsworth (1964: 210, 390, 214, 266, 508)

1976: 18). With the exception of *Croton* sp., each of the woods in the Three Dog Site assemblage is a high density wood, measured by specific gravity (Table 1). In fact, the woods range from moderately heavy to heavy.

Other woods make good fuel because they contain resin which increases their kilocaloric (and thus energy) values. In addition to being a heavy wood, *Guaiacum* sp. is characterized by a distinctive oily resin (Wadsworth and Little 1964: 212).

Availability

The availability of the wood is another feature determining what might have been selected. Availability is determined by abundance in the environment and ease of procurement. Abundance is related to the spatial distribution of the species. Ease of procurement is determined by a combination of factors such as proximity, growth factors affecting transportability, procurement technology, the organization of wood collection, and competition with the inhabitants of other settlements in the vicinity.

Abundance: It is more cost effective to harvest woods which grow in concentrations than woods which exist as a single unit. Plants which grow in concentrated populations would have had a higher selective value in that more wood can have been gathered per unit area. Thus, species which grew in clumps, such as mangroves, might have been selected over others which did not. Furthermore, if one is exploiting a number of different communities, it is easier to gather wood that grows in a number of them, rather than one. *Conocarpus* sp., for example, is present today in three plant communities on San Salvador (Smith 1982), which might help to explain why it was the second most represented wood.

Proximity: Because of its weight, bulk and the need for a constant supply, it would have been cost-effective for inhabitants of the site to have gathered wood in close proximity to it. We do not know whether the distribution of plant communities during prehistory was the same as that observed today on San Salvador. The plants in the charcoal assemblage grow today in six different plant communities on San Salvador (Smith 1982). If the spatial distribution of the prehistoric flora was like that of the contemporary landscape, the inhabitants of the site would have procured wood from at least four or six different plant communities. These include: coastal coppice/coastal thicket; coastal coppice/coccothrinax-scrub; freshwater palmetto flat; mangrove swamp; blackland/coppice; blackland/open thicket (Table 3). All of these, with the exception of the mangrove community, lie within 5 kilometers of the site. One community, the blackland coppice, was used more heavily than others, as three of the identified woods (*Guaiacum* sp., *Erythroxylon* sp., and *Exostema* sp.) grow there today. Both the blackland/coppice and the coastal coppice lie less than one kilometer from the site. The collection of wood would not have taken the inhabitants far away from their settlement, if we assume a similar distribution.

Gatherability and transportability: It is not always necessary that a whole tree be cut down to procure wood. Fallen branches and limbs create a ready source of fuel wood, as do standing dead trees. Lightning, wind, hurricanes, and other forces are contributing factors in the Caribbean. Inundation by salt water and sea spray are responsible for killing and stunting vegetation. In Bimini, it has been noted that salt water flooding often killed trees leaving dead woody vegetation (Howard 1950: 324). The lowering of water tables through natural or human modified means results in vegetative destruction. In his survey of the flora of Bimini, Howard (*ibid.*) observed stands of dead *Conocarpus*, killed, he believed, by the lowering of the water table following the draining of a pond. Moreover, the slash and burn method of clearing fields results in dead and fallen woody vegetation. It is believed that this was the means by which the inhabitants of the Three Dog Site created their gardens and fields. Carniero (1978: 201-2) has noted that the Kuikuru Indians of Brazil collect their fuel wood over a period of several months from the charred wood produced from preparing their fields. In this way, fewer trips to dense parts of the forest have to be made. Most agriculture on San Salvador is conducted in the blackland community (Smith 1982), considered to contain the most fertile soils in the Bahamas (Sealey 1985). It is possible that agriculture was conducted here during prehistory. Three of the species represented in the charcoal assemblage originating from the blackland community might have been brought back from recently burned fields.

Table 3: Representation of Fuel Wood Assemblage in contemporary Plant Communities

CONTEMPORARY PLANT COMMUNITIES	IDENTIFIED CHARCOAL SAMPLES THREE DOG SITE (SS21) SAN SALVADOR ISLAND, THE BAHAMAS				
	Guaiacum sp.	*Erythroxylaceae* sp.	*Conocarpus* sp.	*Croton* sp.	*Exostema* sp.
1) COASTAL ROCK					
2) SAND STRAND AND UNIOLA					
3a) COASTAL COPPICE: COASTAL THICKET				PRESENT	
3b) COASTAL COPPICE: COCCOTHRINAX-SCRUB				PRESENT	
4a) FRESHWATER PALMETTO FLAT			PRESENT		
4b) FRESHWATER TYPHA MARSHLAND					
5) WHITELAND					
6a) MANGROVE SWAMP			PRESENT		
6b) OPEN MANGROVE FLAT					
7a) BLACKLAND: AGRICULTURAL AND DISTURBED		PRESENT?			
7b) BLACKLAND: COPPICE	PRESENT	PRESENT			PRESENT
7c) BLACKLAND: OPEN THICKET			PRESENT		
7d) BLACKLAND: SINKHOLES					

Tree height and trunk width are other factors (in combination with technology) which might have influenced selection. It is easier to cut down a tree with a smaller diameter, especially when raw materials are limited. In Table 2 the tree heights and trunk diameters are given for species identified from the site. It should be kept in mind that these measurements are from Puerto Rico and the Virgin Islands, however (Little and Wadsworth 1964), where ecological conditions vary from that of the Bahamas, and San Salvador, in particular. With the exception of *Exostema* sp., it appears that there is an inverse relationship between frequency of occurrence of charcoal and height and diameter. In other words, charcoal from shorter and narrower tree species is represented in greater proportions. Such trees might have been selected for because of the ease with which they might have been cut down, burned, or felled by natural forces.

Procurement technology refers to the means by which wood might have been harvested and transported from where it was gathered to where it was used. At many prehistoric sites throughout the Bahamas, fine-grained metamorphic igneous stone axes and celts have been found. Such material is not native to the Bahamas archipelago, and, macroscopically, it appears to have been imported from Cuba and Haiti. The specimens I have observed in museum collections at the Field Museum of Natural History and the Peabody Museum of Natural History, Yale University, show evidence of use, presumably in cutting down trees and branches. Wood harvested some distance away from the village (or even from other islands) might have been transported via canoes which moved people and goods between islands and throughout the extensive inland lake system of San Salvador.

ENVIRONMENTAL RECONSTRUCTION

The preceding discussion demonstrates that there are many factors that determined the array of recovered woods from the Three Dog Site. The wood identified in a charcoal assemblage represents only a segment of the flora that existed at earlier point in time; in fact, it only represents a portion of the different kinds of woods that might have been used by prehistoric peoples for a number of purposes and a wide variety of activities. However, it is possible from the fuel wood assemblage to derive a preliminary, albeit partial reconstruction of the environment of San Salvador during prehistory.

First, the identification of the wood allows us to identify some of the taxa growing in the area at the time the site was occupied. This provides a preliminary baseline for measuring changes in the floristic environment that have occurred since the islands were first colonized. From this, interpretations can be made of forest succession, community composition and structure, and of the nature and extent of de- or re-forestation during later prehistoric and historic occupations (see for example, Byrne 1972). It is curious, for example, that other woods observed today on San Salvador, whose densities are equal to or greater than the woods recovered from the Three Dog Site, are absent from the archaeological assemblage. Trees such as red mangrove, *Rhizophora mangle*, a member of the mangrove community, has a hardness which varies from 0.90-1.20 (Little and Wadsworth 1964: 384). It can be found 2 kilometers from the site (Smith 1982). Furthermore it coppices readily (Little 1983: 294; National Academy of Sciences 1980) assuring a steady, replaceable supply of wood. Newsom (1991: 20, 27) has noted a similar absence of this species in the fuel wood assemblage from the Wanapa Site in Bonaire, where, today, red mangrove grows near the site and from the Maisabel Site in Puerto Rico, which also is located in close proximity to an extensive mangrove community.

Second, it can be inferred from the wood in the assemblage that the climate, soils, and other growing conditions responsible for the growth of these plants were similar in a general way to those observed today. It is possible, however, that microenvironmental conditions conducive for the growth of, for example, red mangrove was not present at the time of occupation.

CONCLUSION

Archaeological wood assemblages provide insight into a number of features characteristic of the prehistoric floristic environment and how it was used. The presence of charred wood in an archaeological site is due to a number of factors,

TABLE 4 : Site Catchment of the Three Dog Site (SS21)

Plant Community Type or Environmental Type	Distance in Kilometers				
	01	1-2	2-3	3-4	4-5
Coastal Rock	X				X
Sand Strand and Uniola		X	X	X	X
Coastal Coppice/Coastal Thicket	X	X	X	X	X
Coastal Coppice/Coccothrinax-Shrub					X
Freshwater Formation/Palmetto Flat		X	X		
Freshwater Formation/Typha Marshland					
Whiteland			X	X	X
Mangrove/Mangrove Swamp			X	X	X
Mangrove/Open Mangrove Flat	X	X	X	X	X
Blackland/Agricultural and Disturbed Areas	X	X	X	X	X
Blacklands (Coppice)	X	X	X	X	X
Blacklands/Open Thicket					
Blacklands/Sinkholes					
Highest Elevation in Feet	50	20	80	113	100
Lakes/Ponds	X	X	X	X	X
Blueholes				X	X
Inshore-Estuarine	X				X
Banks	X				X
Reefs	X				
Offshore-Pelagic		X	X	X	X

Source: Smith (1982)

which must not be ignored. At the Three Dog Site, the composition of the charcoal assemblage can be attributed to the means by which it was recovered from the archaeological record, its physical properties affecting preservation, the locations from which the samples were taken, and the uses to which the wood was put. Because there are so many factors which contribute to the formation of a charcoal assemblage, the degree to which any particular wood type is represented in an assemblage should be interpreted prudently (Smart and Hoffman 1988).

In this study it was ascertained that the charcoal recovered from the site was part of a fuel wood assemblage and that certain inferences about fuel wood selection can be made. For example, it was found that the species represented in the assemblage were selected because they produced intense heat and were capable of burning for extended periods of time. In addition, it appears that certain species, such as *Conocarpus* sp. were easy to collect, as it grows in dense concentrations (Lee Newsom, personal communication, 1991a) and in three plant communities. The data also suggest that shorter, narrower trees were selected in greater quantities than taller, wider species. Moreover, it can be inferred that a least-effort strategy of fuel wood collection was practiced by the prehistoric inhabitants of the Three Dog Site.

Finally, several preliminary statements about the floristic environment can be made from these remains. First, it appears that the taxa recovered archaeologically are present today. This suggests that general growing conditions have changed little since prehistory.

The study of the wood charcoal from the Three Dog Site reflects a preliminary attempt at examining the adaptation of the Lucayan-Taino to their island ecosystem. The sample analyzed here is one of a larger number of samples of *in situ* and screen-recovered charcoal and flotation samples awaiting identification and analysis. It is hoped that the completion of the wood charcoal study will result in answering our questions about Lucayan-Taino lifeways and raise additional, unexpected ones for archaeologists and paleoethnobotanists to pursue in future excavations.

ACKNOWLEDGEMENTS

I thank Dr. Perry L. Gnivecki, co-director of the Lucayan Ecological Archaeology Project for his helpful comments and insights. A debt of gratitude is extended to the project paleoethnobotanist, Dr. Deborah Pearsall, University of Missouri-Columbia, who identified the plant remains and has advised on the site's plant recovery procedures. Similarly, a big thank you is due to Dr. Richard I. Ford, University of Michigan, for his support and interest in this project. Helena Mariella-Walrond and Christine Maletta, Wake Forest University, assisted in various aspects of this paper.

I also acknowledge the help of Lee Newsom, Florida Museum of Natural History, who shared a number of her unpublished and in press manuscripts on the paleoethnobotany of the West Indies with me. Dr. Ben Rouse, Yale University, has, since the inception of this project, been an interested and supportive mentor. A major thank you goes to Dr. John Winter, Molloy College, for finding the site for us. Additionally, I thank Dr. Gail Saunders, Director, Department of Archives, Nassau, Bahamas, for allowing this excavation and its subsequent analyses to take place. Finally , a major acknowledgment of gratitude goes to Dr. Donald and Mrs. Kathy Gerace of the Bahamian Field Station for their friendship and unflagging support.

Funds for the analysis of the plant remains were supported by a Hartwick College Board of Trustees Research Grant in 1986. The results of additional research presented here were supported by a 1991 National Endowment for the Humanities Travel to Collections Grant, a 1990 Wake Forest University Research and Creative Activities Council Grant, and a 1985 Hartwick College Board of Trustees Research Grant. The faunal assemblage was analyzed by Dr. Elizabeth Wing, Florida Museum of Natural History with support of NSF Grant BNS-8903377.

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