ARCHAEOLOGICAL AND TAXONOMIC SIGNIFICANCE OF ANCIENT WOOD SAMPLES FROM AHANVE, BADAGRY, NIGERIA

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ABSTRACT

Ancient wood samples from an archaeological excavation, Test Pit II, in Ahanve, near Badagry were analysed to ascertain their identity. Anatomical study of the wood samples revealed oval-circular xylem pores, diffuse apotracheal axial parenchyma, procumbent and homogeneous ray and non-septate fibres, all consistent with the micromorphological characters of *Milicia excelsa*. The similarities observed in the morphological and anatomical structures of the samples indicate they have the same origin. A radiocarbon date obtained from TP I, a pit adjacent to TP II, suggests that the *Ìrókò* tree was present at the earliest occupation period of the village and fell probably sometime in the 17th century most likely due to old age.

Key words: Archaeobotany, *Milicia excelsa*, Wood anatomy, Rainforest, Nigeria.

INTRODUCTION

Archaeology, like forensics, attempts at recovering material remains which provide evidence for understanding past life ways and environment of a people using a set of tested scientific methods. A major method employed in almost all archaeological studies is excavation; this is a systematic unearthing and eventual retrieval of materials from archaeological sites which constituted part of the space occupied by peoples in the ancient and/or recent past. The significance of the retrieved materials (artefacts) depends partly on what was preserved and as much information that can be obtained from their "interrogation". The variety of artefacts recovered from archaeological excavations includes pottery, stones, beads, metals, animal (bones, teeth) and plant remains (charcoal, fruits, pollen, seeds, spores and wood) and soils. Hence archaeology partners with related fields in the Sciences such as Botany (Archaeobotany) and Zoology (Archaeozoology) in the identification of plants and animal remains. Due to the acidic nature of soils in Nigeria, once deposited most plant parts quickly decay and are absent in the archaeological record. However when present they provide invaluable information about the local environment of an area. For example the 8000 year old Dufuna canoe retrieved from a water-logged environment in Dufuna village in Yobe State, North-Eastern Nigeria is an exception. This canoe is believed to have been dug out from *Khaya senegalensis*, a large savanna tree species. In the mid Holocene, climatic conditions were humid and warm hence the occurrence of the dugout canoe in a presently Sahel zone, revealed the importance of water transportation and fishing during that period (Breunig, 1996).

In a recent excavation in Ahanve, near Badagry materials such as pottery, animal and fish bones, snail shells, bivalves, smoking pipes, beads, iron slag and objects, charcoal, palm kernels and glass along with fairly well preserved wood (Figure 1) were recovered (Orijemie, 2013). The wood samples were recovered from two different spit levels (Table 1). Oral information gathered from the people suggests that the excavation site was once occupied by a deified large *Ìrókò* tree (*Milicia excelsa*) which had fallen several years ago. The tree was home to a fertility god to which persons in need of children offered sacrifices for cleansing and blessings. Therefore could the pieces of wood recovered from the excavation be the remains of the deified *Milicia excelsa* or a different tree? Hence the aim of this study is to identify the wood samples recovered from the Ahanve archaeological excavation with a view to relating them to the environmental archaeology of the Badagry area

The *Ìrókò* is believed to be a sacred tree in Yoruba mythology (Agbaje-Williams, 2005) as well as in the Savè hills, in neighbouring Bénin Republic

(Gurstelle, 2013). Generally, it is thought to be the home of powerful gods often invested with the power of fertility (Oladosu, 2015). Hence sacrificial objects such as oil, eggs and other food items placed in earthen bowls or pots are usually found at its buttresses. *Milicia excelsa* is considered sacred in Igboland from which *Okpensi* an ancestral stool is carved (Anizoba, 2002 In: Ndubueze, 2012); it also features prominently in the proverbs of the Ibibio in southern Nigeria as one of the respected trees in the rainforest (Okon and Ansa, 2012). Furthermore in a case of E. N/A vs Aliat in Nigeria, the defendant was fined an equivalent of N400 for felling an Ìrókò tree without permission in 1934 (Oke, 2009). In South America and the Carribean, "*Iroko*" (*Ficus* spp.), not *Milicia excelsa*, is seen by the translocated Yoruba slaves as "a meeting place for the wisdom and the experiences of *Orun* and *Ayé*" (Espin, 2000:15). The cultural significance of *Iroko* (*Milicia excelsa*) to West Africans is deep such that on arrival as slaves in South America and the Carribean where *Milicia excelsa* is not indigenous (Orwa *et al.,* 2009), they accorded the white gameleira (*Ficus doliaria* M.) the same veneration of *Milicia excelsa* (Espin, 2000). Evidently this tree is of cultural significance in Nigeria and parts of West Africa.

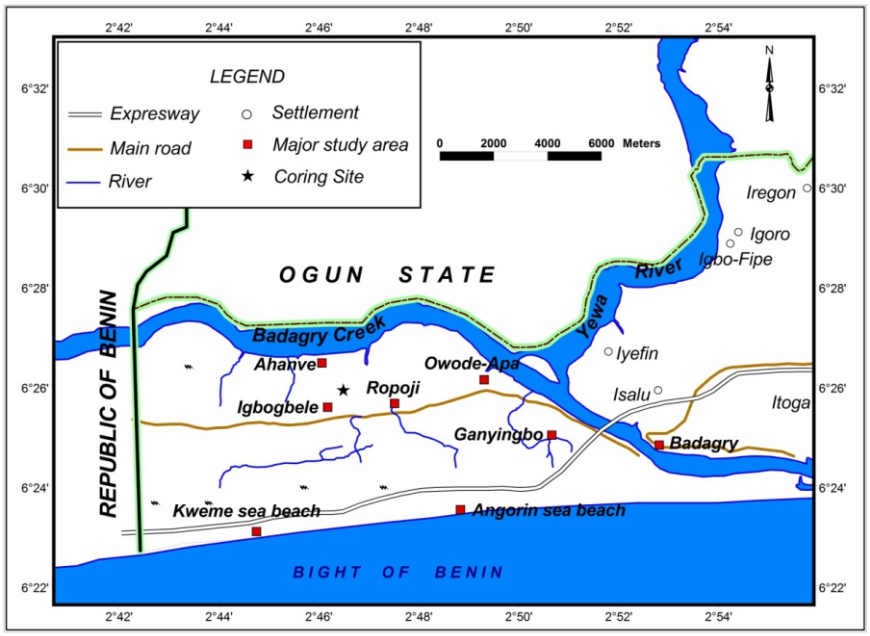

Figure 1: Map of Badagry area showing Ahanve from where the wood samples were recovered

MATERIALS AND METHODS

The excavation was carried out at a test pit located at N 06° 43112´ E 002° 77534´ with excavation progressing at 10 cm spit level. The excavated unit was 2 x 1m, named Ahanve Test Pit II (AHF TP II) and was 110 cm deep. At a distance of 12.6 m to the north-west of AHF TP II was another excavated unit, Ahanfe Test Pit I (AHF TP I) was 210 cm deep. This AHF TP I unit was dated, and used to correlate AHF TP II since the latter was not dated. Stratigraphic layers for AHF TP II were based on the recovery of artefacts (Table 1), and colour and texture changes of the soil type (Figure 2). One sample each from those recovered from the two spit levels (Figure 3) was selected for study partly to ascertain whether they came from the same plant. Samples were sectioned using Reichert sliding microtome at 10 microns; some of the wood samples were also macerated using Schulz' fluid. The sections were stained in Safranin O and counter-stained in Alcian blue while the macerates were stained in Safranin O (Akinloye *et al.*, 2012) and mounted on slides. Slides were observed under the microscope and measurement of cell dimensions was with ocular micrometers. Photomicrographs of the sections and the macerate are shown in Figure 4.

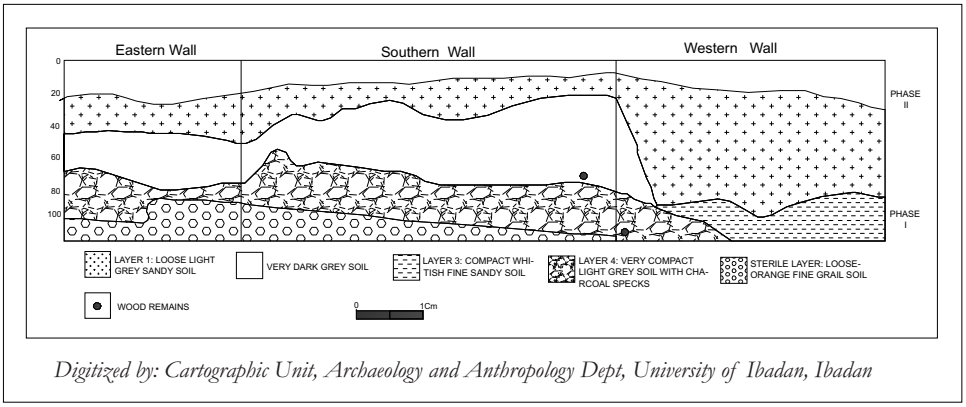

Figure 2. Stratigraphic profiles of the wall sections of the excavated unit (AHF TP II) showing where the wood samples were recovered.

RESULTS

Materials recovered from the excavated unit, AHF TP II, include, apart from the wood samples, pottery, charcoal, smoking pipes (local and foreign), animal bones, rusted nails (metal objects), iron slag, snail and bivalve shells, glass/broken bottles, hearth, palm kernel shells, spindle whorl and glass beads (Table 1). Five stratigraphic/cultural layers (1-5) were recognised in the test pit (Figure 2); soil colours from the stratigraphic layers ranged from light gray, dark gray to black (Table 2) while anatomical details of the wood samples are presented in Table 3. The wood samples named AHF sample a and AHF sample b were recovered from levels 100-110 cm and 60-70 cm respectively in the excavated unit AHF TP II.

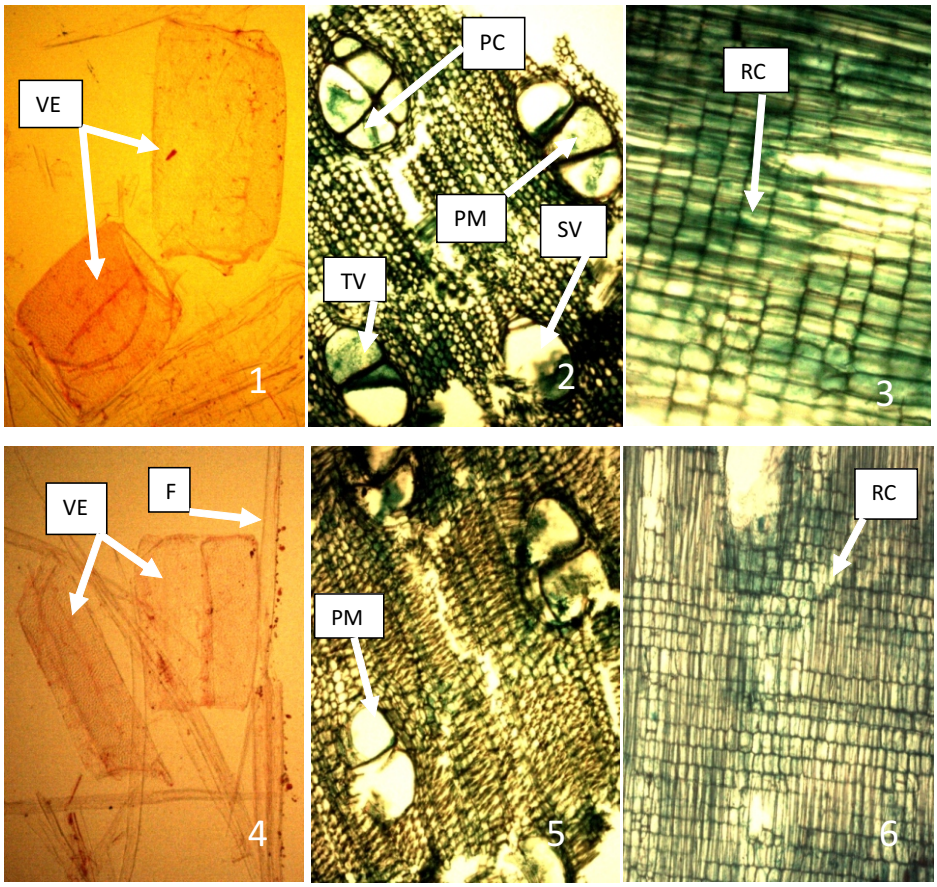

Figure 3. Anatomical structures of wood samples from AHF TP II; AHF sample a: 1-3., and AHF sample b: 4-6. VE: Vessel element, PC: Pore cluster, PM: Pore multiple, SV: Solitary vessel, TV: Tylose in vessel, F: Fibre, RC: Ray parenchyma. Magnification x 320µm

Table 1: Proportion of Materials Recovered from AHF TP II, Ahanve near Badagry, Nigeria

Depth of AHF TP II (cm)	Recovered Materials													
	Pottery	Animal bones	Snail shells	Bivalve	Smoking pipes	Glass Beads	Iron slags	Metal objects	Charcoal particles	Stones	Palm kernels	Glass	Wood samples	Total
0-10	120	-	2	-	-	-	1	1	23	-	-	2	-	149
10-20	169	-	2	-	1	-	2	-	21	-	1	-	-	196
20-30	356	-	-	-	2	-	10	-	75	-	17	-	-	460
30-40	246	-	10	-	8	-	13	5	81	-	18	-	-	382
40-50	348	25	5	-	5	5	14	3	55	10	18	5	-	493
50-60	259	17	-	-	4	1	9	2	66	2	18	-	-	378
60-70	252	-	3	1	4	-	7	6	100	-	14	-	3	390
70-80	100	-	1	-	-	-	1	-	-	-	21	-	-	123
80-90	71	1	1	-	-	-	1	-	1	-	8	-	-	83
90-100	1	-	-	-	-	-	-	-	-	-	-	-	-	1
100-110	20	-	-	-	-	-	-	-	-	-	-	-	2	22

Table 2: Sediment Colour Changes in Relation to Cultural Layers of AHF TP II, Ahanve near Badagry, Nigeria

Layer	Depth (cm)	TPII	Remarks
5	0-20	Dark brown	The soil is loose and fine grained. Iron slag and iron object (nails) remained in this layer.
4	20-55	Dark brown	Smoking pipes and glass beads were recovered from this layer. This was the last layer where animal bones were recovered
3	55-78	Light gray	Compact, whiti sh fine sandy soil. The soil contained pottery, snail shells, charcoal, stone and palm kernels.
2	78-105	Very dark brown	Very compact soil with charcoal specks. Animal bones, bivalves, iron slag, charcoal and charred palm kernel were the major materials recovered from this layer.
1	105-110	Yellowish brown	This is the sterile layer. Soil is loose and fine grained. Pottery was recovered from this layer.

Wood Anatomy

Table 3: Anatomical Details of Wood Samples from AHF TP II, Ahanve, near Badagry, Nigeria

Wood samples	Xylem	Tylose	Axial Parenchyma	Ray	Tangential Plane	Fibres	Vessel Element	Perforation plate
Sample b (60-70cm)	2 oval, circular, pores cluster none, mainly solitary vessel. Pore shape oval, circular, saucer and arch.	None	Diffuse Apotracheal	Procumbent and homogeneous	Decayed	Non-septate; some have large lumen, others have no lumen.	Simple dense pitting; some have short tail, others lack tails	Simple
Sample a (100-110cm)	2-5 oval, circular pore cluster	Present	Diffuse Apotracheal	Procumbent and homogeneous	Decayed	Non-septate with large lumen and narrow wall	Simple dense pitting; short and long tails present	Simple

Wood samples	Fibre Characteristics [µm]			
	Length	Lumen	Wall thickness	Diameter
Sample b (60-70cm)	1503	31.9	5.63	42.5
Sample a (100-110cm)	1419	39	3.3	45.6

DISCUSSION

In general, the morphological and anatomical features of the two wood samples are similar hence it is assumed that they are from the same plant. One of the unique features of the wood samples is that they have non-septate fibres. Out of ten timber species in Nigeria, the anatomical features of which were studied, non-septate fibres were found in *Afzelia africana* and *Milicia excelsa* (Jayeola *et al*., 2009). Although both species have solitary vessels, tyloses are present in *M. excelsa*, as in the archaeological wood sample but absent in *A. africana* (Jayeola *et al.,* 2009). In addition, the fibre lengths of the fossil wood samples compare positively with those of *Milicia excelsa* although differences exist in terms of diameter (Jayeola *et al*., 2009). This may not be unrelated to the age and compressed nature of the archaeological samples. Furthermore, vessel shape, ray parenchyma and fibres of *Milicia excelsa* trees in Ghana (Antwi-Boasiako and Atta-Obeng, 2009) are similar to those in the Ahanve samples. The similarities in the anatomical details between the archaeological and modern wood samples from Nigeria and

Ghana suggest that the former is that of *Milicia excelsa*.

The results from the wood anatomy are supported by the occurrence of cf. *Milicia excelsa* pollen in the sediment record of Ahanve. Palynological study of a 2m core obtained from the freshwater swamp located less than 50 m from the excavated unit revealed that Moraceae was part of the diversified rainforest vegetation that was present in Ahanve from the mid-late Holocene period; climate at those times was wet and warm (Orijemie, 2013; Orijemie and Sowunmi, 2014). The rainforest species included those of *Anthocleista vogelli, Ceiba pentandra, Gaertnera paniculata, Hannoa klaindeana, Hymenostegia afzelli, Irvingia gabonensis, Lovoa trichiloides, Nauclea diderrichii, Pentaclethra macrophylla, Pycnanthus angolense, Tetrorchidium didymostemon* and *Triplochiton scleroxylon* (Orijemie, 2013). However with the onset of drier conditions around 3000 yrs B.P. (Sowunmi, 2004) and subsequent anthropogenic impact on the environment, the rainforest became degraded and was replaced by secondary forest. The effect of humans on the Ahanve environment became more evident in the historic phase as *Milicia excelsa* subsequently declined and eventually disappeared at 10 cm of the Ahanve core (Orijemie, 2013). On the basis of the occurrence of foreign smoking pipes, two occupation phases were delineated in AHF TP II. These are Phase I (60-110 cm) which is without foreign smoking pipes and Phase II (0-60 cm) which contained foreign smoking pipes (Table 1, Figure 3). These occupation phases were also recognised in the dated AHF TP I, Phase I (130-210 cm) and Phase II (0-130 cm) (Orijemie, 2014). In Phase I, the people engaged in a variety of activities most prominent of which were farming, hunting of game and pottery and salt production. During Phase II, Europeans had influence over the area, and introduced among other things European salt and smoking pipes.

The similarities in the pattern of occurrence of cultural materials as well as appearance of smoking pipes in the two test pits suggest that the two occupation Phases in TP I and TP II are likely contemporaneous. It appears that AHF TPII was not a refuse dump site but one of some cultural importance. Firstly, few animal bones, snail shells and charcoal pieces were recovered from Phase I. Secondly no fish remains were recovered. Considering the littoral location of Ahanve (Figure 1) viz-a-viz the fishing occupation of her people, the complete absence of fish materials is significant. This is in contrast to the refuse mound AHF TP I, the recovered archaeological materials of which reflected the people's exploitation of aquatic resources (Orijemie, 2014). Thirdly, glass beads were only recovered from this test pit which reflects the symbolic nature of this site. Ige (2010) explored the importance of beads, and stated they were comparable to gold, and most importantly of equal value to children in Yorubaland in ancient times. This is aptly expressed in the Yoruba saying: "*ileke lomo kogbodo ja*" (glass beads are as valuable as children) (Ige, 2010). Therefore the occurrence of these artefacts, especially the glass beads which presumably were used as objects for appeasing the fertility god believed to be resident in the *Ìrókò* tree, reflected the sacred nature of the site.

In TP I, Phase I (130-210 cm) occurred from any time after the 9th century AD to 360 ± 40 BP (1440-1640 yrs AD) [Beta-296133] while Phase II (0-130 cm) occurred immediately after 360 ± 40 BP (1440-1640 yrs AD) (Orijemie, 2014). These relative dates indicate that the *Milicia excelsa* tree was probably present in Ahanve at the earliest period when it was occupied until the recent past when it fell. The recovery of *M. excelsa* wood from 60-70 cm of the excavated AHF TP II, and its pollen until 10 cm of the sediment core suggest that the tree probably fell around the 17th century bearing in mind a 17th century date obtained from level 120-130cm of AHF TP I. It is remarkable that despite the long time since the *Ìrókò* tree fell, the Ahanve people still recount its occurrence at the site where it once stood, and often state this in the narratives of their oral traditions. Their action thus reflects the value of ethnography to archaeological investigations.

CONCLUSIONS

Ancient wood samples were recovered from an archaeological context in Ahanve, near Badagry. Ethnographic information suggested that the samples are from an *Ìrókò* tree which once stood at the excavation site but it fell many years ago. Therefore the anatomy of the samples was studied to ascertain their identity. Anatomical details of

the wood samples are consistent with those of *Milicia excelsa*, and confirm the people's oral account of the existence of an *Ìrókò* there in the distant past. Hence, the study of wood samples recovered from archaeological contexts (Archaeobotany) can be used to test the veracity of ethnographic data, in this case the existence of a deified *Milicia excelsa* tree associated with a fertility god in Ahanve. Based on dates from an adjacent excavated unit it is presumed that the *Ìrókò* tree was present at the earliest occupation period of the site but probably fell in the 17th century most likely due to old age. It may have subsequently been used for other purposes after due cultural rites hence only a fraction of it was recovered from the archaeological record. The ability of the people to recount the legend of the *Ìrókò* tree which may have fallen some 300 years ago underscores the complementary role of ethnography to archaeological research.

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