

# **10<sup>th</sup> International Workshop for African Archaeobotany**

27<sup>th</sup>-30<sup>th</sup> June 2023, Paris (France)

## **Abstracts**

Oral and poster communications



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## TUESDAY, JUNE 27

### 09:00 - 10:00 Welcome

10:00 - 10:45 Opening speech (Amphithéâtre GGE)

### PALAEOENVIRONMENT, LANDSCAPE DYNAMICS (Amphithéâtre GGE)

10:45 - 11:05 *Anthracological study of samples from Terminal Pleistocene and Holocene high Mountain Settlement site of the Bale Mountains, Ethiopia* - Alemseged Beldados, Katharina Neumann, Bodin Stephanie, Tefera Tarekegn, Gotz Ossendorf

11:05 - 11:25 *Using wood charcoal, phytoliths and isotopes as a multi-proxy approach to reconstruct past vegetation in the SW Ethiopian highlands* - Stéphanie Bodin, Katharina Neumann, Amy Styring

11:25 - 11:45 *Preliminary Anthracological studies in the Ziway region (11,600-9200 cal BC, central Ethiopia)* - Friyat Kidane, Aurélie Salavert, Corentin Biets, Lydiane Gantier, Michel Lemoine, Joséphine Lesur, François Bon, Clément Ménard, Caroline Robion-Brunner

11:45 - 12:05 *[online] Age and pollen record of Bat guano from Onualor cave southeastern Nigeria and potentials for paleoenvironmental reconstruction* - Kenechukwu Daniel, Emuobosa Akpo Orijemie

### 12:05 - 13:30 Free Lunch

13:30 - 13:50 *[online] First archaeobotanical evidence of multiporate Poaceae pollen from early-middle Holocene deposits of the Takarkori rock shelter in the central Sahara* - Anna Maria Mercuri, Assunta Florenzano, Eleonora Clò, Rocco Rotunno, Savino di Lernia

13:50 - 14:10 *Shaqadud Archaeology Project – Questions, approaches and preliminary results of an interdisciplinary research project* - Adela Pokorna, Kristýna Hošková, Jan Hošek, Lenka Varadinová, Ladislav Varadin

### CROP DOMESTICATION AND DISPERSAL (Amphithéâtre GGE)

14:10 - 14:30 *Domestication of African food trees: genetic perspectives* - Jérôme Duminil, Aurore Rimlinger, Franca Meguem, Boniface Yogom, Marie-Louise Avana

14:30 - 14:50 *Domestication and diversification in Ethiopian enset (*Ensete ventricosum*)* - Harriet Hunt

### 14:50 - 15:20 Coffee break

15:20 - 15:50 *Origin of the cultivated sorghum in Africa* - Aude Gilabert, Philippe Cubry, Armel Donkpegan, Angélique Berger, Caroline Calatayud, Louis Champion, Jean-François Rami, David Pot, Yves Vigouroux, Christian Leclerc, Monique Deu

15:50 - 16:10 *New Findings from Jebel Moya: the earliest evidence for domesticated Sorghum and animal husbandry* - Anna Den Hollander, Dorian Fuller

16:10 - 16:30 *The use of MicroCT scanning on pottery sherds to investigate the domestication of sorghum in Eastern Sudan and pearl millet in Northern Mali* - Chris Stevens, Aleese Barron, Louis Champion, Frank Winchell, Tim Denham, Christian Dupuy, Dorian Fuller

16:30 - 16:50 *Waymarks in the Sudanese Long durée: developments in sorghum agro-pastoral economies from domestication to the Meroitic savannah state and beyond* - Dorian Fuller

### 17:00 - 18:00 Posters (see p. 4)

18:00 - 20:30 Cocktail (Cafétéria, Campus îlot Poliveau, 43 rue Buffon)

## WEDNESDAY, JUNE 28

### CROP DOMESTICATION AND DISPERSAL (Amphithéâtre GGE)

09:30 - 09:50	<i>Early evidence of domesticated yam (Dioscorea sp.) management at Tse Dura rock shelter, Middle Benue Valley, Nigeria</i> - Emuobosa Orijemie, Cynthia Larbey, C. A. I French, M. K. Jones
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### PLANT USES FOR FOOD AND CRAFT ACTIVITIES (Amphithéâtre GGE)

09:50 - 10:10	<i>Daily practices of food in Likpe Kukurantumi earthwork settlement, Ghana</i> - Patricia Ayipey, Pokorna Adela, Jaromír Beneš
10:10 - 10:30	<i>From the present to the past, reconstructing foodways in Senegal (West Africa) by the analysis of phytoliths in ceramic pots.</i> - Aline Garnier, Pauline Debels, Julien Vieugué, Léa Drieu, Alex Malergue, Valentine Fichet, Martine Regert, Anne Mayor
<b>10:50 - 11:10</b>	<b>Coffee break</b>
11:10 - 12:30	Prof. Ahmed G. Fahmy Memorial Speaker (Amphithéâtre GGE)
11:10 - 11:30	<i>Exploring agriculture and terroirs of the medieval Haouz : interdisciplinary approach at Aghmat (Morocco)</i> - Fatima-Ezzahra Badri, Amandine Cartier, Benoit Marie, Ilham Bentaleb, Sandrine Canal, Leïa Mion, Violaine Heritier-Salama, Chloé Capel, Abdallah Fili, Jérôme Ros
11:30 - 11:50	<i>The Exploitation of cultivated and wild plants in Post-Medieval Nubia: Archaeobotanical Evidence from Old Dongola (16th-19th Centuries AD)</i> - Mohammed Nasreldein, Simone Reihl, Nicholas J. Conard
11:50 - 12:10	<i>Human-Environment Interactions During the Late Pleistocene and Holocene Epochs: An Analysis of Archaeological Charcoals from Three Archaeological Sites in Southern Ethiopia</i> - Tefera Tarekegn, Isabelle Théry-Parisot, Lamya Khalidi, Alexa Höhn
12:10 - 12:30	[online] <i>One man's trash is someone else's treasure: plant remains from the tomb of the Pharaoh Tutankhamun</i> - NagmElDeen Hamza, Claudia Moricca, Laura Sadori
<b>12:30 - 14:00</b>	<b>Free Lunch</b>
14:00 - 14:20	[online] <i>Prehispanic basketry from the Canary Islands: preliminary data on plants used and techniques</i> - Maria Herrero-Otal, Anna Homs, Raquel Piqué, Paloma Vidal-Matutano
14:20 - 14:40	[online] <i>Too many large ceramic vessels and grinding stones: decoding the centrality of beers among the Ngoni in Southern Tanzania</i> - Sinyati Robinson Mark, Thomas Biginagwa
14:40 - 15:00	<i>New development in the archaeobotany of southeast Nigeria</i> - Kingsley Daraojimba
15:00 - 15:20	<i>Reconsidering early agricultural transmissions in the Middle Nile Valley: New dietary data from Kadruka 1 and Kadruka 21, Sudan</i> - Charles Le Moyne, School of Social Science, The University of Queensland
<b>15:20 - 15:50</b>	<b>Coffee break</b>
16:00 - 18:00	<b>Laboratory session / Poster / Herbarium visit</b> - Plant material observation or visit of the Herbarium (ethnobotanical collections, herbarium, xylotheque)

**THURSDAY, JUNE 29****PLANT USES FOR FOOD AND CRAFT ACTIVITIES (Amphithéâtre GGE)**

09:20 - 09:40	<i>New archaeobotanical data from the Mesolithic in the Eastern Sudan</i> - Matteo Delle Donne, Andrea Manzo
09:40 - 10:00	<i>Evolutionary dynamics of vegetative agriculture in the Ethiopian Highlands: the archaeobotany of Enset</i> - Cristina Castillo, Philippa Ryan, Harriet Hunt, Alemseged Beldados, Ermias Lukelal, James Borrel, Dorian Fuller
10:00 - 10:20	<i>Ebony or not ebony? The case of the blackwoods discovered by the Western Wadis archaeological mission (NKRF/University of Cambridge) located in Luxor area, Egypt.</i> - Gersande Eschenbrenner Diemer
<b>10:20 - 10:50</b>	<b>Coffee break</b>
10:50 - 11:10	<i>Botanical Grave Goods from a Late Antique Child Burial from the so-called Temple of Ceres, Mustis (N. Tunisia)</i> - Wiktoria Zgórzak, Monika Badura, Dawid Wiczorek
11:10 - 11:30	<i>Discussing the archaeobotanical evidence of the Nok culture in central Nigeria, 1500-1 BCE</i> - Alexa Höhn, Katharina Neumann, Louis Champion, Julie Dunne

**AGROPASTORAL AND HOUSEHOLD PRACTICES (Amphithéâtre GGE)**

11:30 - 11:50	<i>Archaeobotany of the Egyptian Delta: State of Research</i> - Mennat-Allah El Dorry, Charlene Bouchaud, Aline Emery Barbier, Claire Malleson, Claire Newton, Clémence Pagnoux
11:50 - 12:10	<i>Identifying patterns of plant "waste accumulation" in House 169, Elephantine Island, Egypt (1773–1650 BCE) using Machine Learning.</i> - Claire Malleson, F. Jordan Srouf
12:10 - 12:30	<i>Agriculture and Diet in Cameroon During the Early Iron Age (ca. 500–200 BC)</i> - Louis Champion, Clarissa Cagnato, Pascal Nlend, François NGOUOH, Geoffroy De Saulieu
<b>12:30 - 14:00</b>	<b>Free Lunch</b>
14:00 - 14:20	<i>An integrated approach to the study of phytoliths and thin sections from ground stone tools at elephantine, Aswan, Egypt</i> - Elshafaey Attia, Claire Malleson, Dagmar Fritsch, Johanna Sigl
14:20 - 14:40	<i>Multiproxy archaeobotanical research in medieval Fardowsa, Somaliland: evaluation of the first results.</i> - Llorenç Picornell-Gelabert, Andrés Currás Domínguez, Leonor Peña-Chocarro, Jorge de Torres Rodriguez
14:40 - 15:00	<i>What about Fruit tree cultivation on the semi-arid slopes of the Anti-Atlas during the Middle Ages? Archaeobotanical data from the almohad period at Igilîz (southern Morocco)</i> - Marie-Pierre Ruas, Jérôme Ros, Amandine Cartier
15:00 - 15:20	<i>Food globalisation and indigenous agricultural resilience in the 15th-17th centuries AD: a case study from the Canary Islands</i> - Jacob Morales, Pedro Henríquez-Valido, Amelia Rodríguez, María del Cristo González-Marrero
<b>15:20 - 15:40</b>	<b>Coffee break</b>

**COLLECTION, KNOWLEDGE, DISSEMINATION (Amphithéâtre GGE)**

15:40 - 16:00	<i>Storage practices in the Moroccan Atlas: ethnographic data on cliff granaries from Aoujgal</i> - Leonor Peña-Chocarro, Jacob Morales, Guillem Pérez-Jordà, Ismail Ziani, Carlos López de Calle Cámara, Juan Manuel Tudanca
16:00 - 16:20	<i>The ethnobotanical collections of the French National Museum of Natural History: from their colonial origin to recent scientific projects</i> - Flora Pennec, Didier Geffard-Kuriyama, Maire-Aimée Allard, Etienne Martiné, Simon Juraver

*Park, Senegal* - Tereza Majerovičová, Miguel Ballesteros, Idrissa Manka, Jan Novák, Jiří Bumerl, Alioune Deme, Jaromír Beneš

16:40 - 17:00 *Seeds and their Stories: Botanical Heritage, Education, and Public Engagement in Tanzania* - Sarah Walshaw, Sinyati Robinson Mark, Cecylia Paul Mgombele

17:00 – 17:30 *Concluding remarks*

**19:00 - 23:55 Evening event**

## POSTERS

*Impact of ethnobotanical study on preservation of local plant diversity and local knowledge* - Djamila Chabane *et al.*

*Archaeobotanical assemblage from Old Dongola, Sudan* - Cristina Castillo *et al.*

*Archaeobotanical findings from Jebel Barkal (Sudan)* - Anna Den Hollander

*Revisiting the Mound of the Pharaohs: New Analysis at Buto, Egypt* – Mennat Allah El Dorry

*The exploitation of plant food types in the Jos Plateau, central Nigeria* - Emuobosa Orijemie *et al.*

*Shaqadud Archaeology Project. Reconstruction of environmental changes and food resources availability. Introduction to methods* - Adela Pokorna *et al.*

*Food for thought: Archaeobotanical evidence of plant subsistence in Late Antique Marea, Egypt (preliminary results)* - Tzvetana Popova *et al.*

*An ancient Egyptian gardener's secret: four unidentified floras raised in early New Kingdom Theban formal gardens* - Jayme Reichart [online]

*Archaeobotany of Great Zimbabwe* - Alice Williams



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# **PALAEOENVIRONMENT, LANDSCAPE DYNAMICS**

# Anthracological study of samples from Terminal Pleistocene and Holocene high Mountain Settlement site of the Bale Mountains, Ethiopia

Alemseged Beldados <sup>a 1</sup>, Katharina Neumann<sup>b 2</sup>, Boidin Stephanie<sup>c 2</sup>,  
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Archaeological investigation under the "Mountain Exile Hypothesis" (MEH) project at the Bale Mountains (BM) in Ethiopia is shedding new light on the human adaptation to high-altitude environments in Africa. In the BM, several sites including Fincha Habera, Mararo, Fish Shelter, and Simbiro with an altitude of 3469, 3779, 3423, and 3519 meters above sea level (masl) respectively have been the focus of archaeological studies. The archaeological remains coming from the BM probably suggest that the African high-altitude ecozones were occupied by hunter-gatherers during the Late Pleistocene due to its environmental stability during times of environmental uncertainty in lowlands. The BM has a very rich plant cover that ranges between Afro-alpine vegetation, Moist Afromontane Forest and Dry Afromontane Forest. Currently, the BM possesses *Erica arborea*, *Myrsine africana*, *Solanum giganteum*, *Artemisia afra*, *Hagenia abyssinica*, *Hypericum revolutum*, and *Juniperus procera* as possible sources of fire woods for the local inhabitants. Charcoal remains from excavations of four different localities, namely Fincha Habera (n=159), Fish shelter (n=146), Simbero (n=106) and Mararo (n=74) were analyzed to reconstruct vegetation history, ancient fire use and palaeoenvironment of the study areas during the late Pleistocene, Early Holocene and Mid-Holocene. Some preliminary anthracological identification includes *Erica* sp., *Rubiaceae* type, *pental* cf. *schimperia* type, etc.

**Keywords:** Anthracology, ecology, past environment, highland, Ethiopia

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# Using wood charcoal, phytoliths and isotopes as a multi-proxy approach to reconstruct past vegetation in the SW Ethiopian highlands

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The highlands of South West Ethiopia are part of the Eastern Afromontane biodiversity hotspot. They host more than 5200 vascular plant species of which about 10% are endemic. Nowadays, the vegetation of the highlands is highly impacted by human pressure and in particular agropastoralist activities which have led to a dramatic deforestation. The remaining patches of Afromontane forests grow between 1800 and 3000 m asl, where the rainfall and temperature ranges are suitable to allow their persistence. As the highlands capture higher rainfall than the lowlands, it has been hypothesized that they may have acted as refugium areas during dry periods, for example after the African Humid Period, while the lowlands were undergoing aridification and resource depletion.

So far, no palaeoecological data are available in the SW highlands to test this hypothesis. Yet, archaeological excavations led in rock shelters in the last decade have provided abundant and well-preserved palaeobotanical remains, including macroscopic wood charcoals and phytoliths dating back to the end of the African Humid Period.

Here, we present the results of the wood charcoal and phytoliths analyses from the Sodicho and Mochena Borago rock shelters, located in the SW highlands at 1900 and 2200 m asl, respectively. Charcoal and phytoliths assemblages from Sodicho indicate an opening of the dry Afromontane forest linked to human activities (fires) after the African Humid Period. This is evidenced, for example, by the dominance of fire-tolerant Proteaceae and *Acacia* sp. in the assemblage as well as burnt phytoliths. Charcoal analysis from Mochena Borago is still ongoing, but so far, the forest around this rock shelter seems to have been less impacted, as indicated by the presence of typical forest taxa (*eg.* a gymnosperm and *Olea*) and almost no burnt phytoliths. Ongoing analysis of isotopes will help to complete this picture of the past vegetation. Our results suggest that even if the highlands may have kept a forest cover during dry periods, human activities were also shaping the landscape in some areas, as in Sodicho, showing that people were not necessarily seeking refuge in dense forest cover but were also actively modifying it, likely to improve resource availability.

**Keywords:** Palaeoecology, Anthracology, Vegetation reconstruction, Rock shelter, Ethiopia

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<sup>a</sup>Speaker

# Age and pollen record of Bat guano from Onualor cave southeastern Nigeria and potentials for paleoenvironmental reconstruction

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Since bat guano in the tropical areas, contain properties for the preservation of pollen and spores. A well-preserved, diverse palynomorph types and xylem vessel were found in Onualor cave southeastern Nigeria. This paper presents a result of radiocarbon (<sup>14</sup>C) age and pollen assemblage from bat guano in Onualor cave an archaeological site. Pollen assemblage from the surface sediment and stratified bat guano yielded a total of 47 palynomorph types and xylem vessels. The phytoecological group suggested alternating paleoenvironmental conditions, Low-land rainforest and humid conditions (layers 5 and 3) and open vegetation and dry conditions (layers 4, 2-1). A record of freshwater species and fungal spores suggested wet period which later contrasted to dry period inferred from abundant pollen of *Poaceae*, *Elaeis guineensis* and *Asteraceae*. The contrast in the paleoenvironmental conditions showed evidence of human presence and interaction with the environment, this inferred from edible pollen *Dacryodes edulis* (African Plum), and *Blighia sapida* (Ackee apple tree). The presence of abundant iron smelting debris (slag) within the cave premises suggested the area as an industrial site which trees were used for fuel during smelting and other different uses. Radiocarbon date of 3517–3396 cal BC (5466–5345 cal BP) and 3386–3363cal BC (5335–5312 cal BP) suggested the possible period of deposition of bat guano. Possibly at this period, the vegetation might have been harsh for continuous human occupation.

**Keywords:** Radiocarbon (<sup>14</sup> C), palynomorph, palaeoenvironment, bat guano

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<sup>a</sup>Speaker



# Preliminary Anthracological studies in the Ziway region (11,600-9200 cal BC, central Ethiopia)

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The end of the Pleistocene and the Holocene are the scene of crucial climatic and socio-economic changes in the human history of East Africa, such as the cold and dry period of the recent Dryas (ca. 12,900 -11,700 ka). Their impacts on woody vegetation and practices related to firewood exploitation are still very poorly documented for the Late Stone Age, and beyond. The scarcity of archaeobotanical studies in the Horn of Africa is partly due to the absence of reference collection dedicated to the region, including Ethiopia, which has a high rate of endemism and a high woody biodiversity.

This communication presents the implementation of the anthracological reference collection of the UMR AASPE. In addition, the results of the preliminary study carried out at 2 sites (B1s1 and D2S1-3), occupied during the Late Stone Age (15/12 00-9000 cal BC) will be discussed. In the state of progress of analysis, the assemblages present a low taxonomic diversity. Charcoal assemblages are mainly composed of acacias (*Acacia* spp.) and *Rhus* sp. from B1S1, *Acacia* spp., *Rhus* sp., *Olea* sp. and Cf. *Commiphora* sp. from D2S1-3.

This research is part of the interdisciplinary project BigDry (2014-2019) funded by the Agence Nationale de la Recherche (ANR, France, coord. F. Bon), and the Commission consultative des recherches archéologiques à l'étranger (Ministère de l'Europe et des Affaires étrangères, France).

**Keywords:** charcoal analyses, landscape, firewood, Rift valley, man environment relationship, Late Stone Age

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# First archaeobotanical evidence of multiporate Poaceae pollen from early–middle Holocene deposits of the Takarkori rock shelter in the central Sahara

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The Takarkori rock shelter, located in the Tadrart Acacus mountains in southwestern Libya (central Sahara), has been the subject of interdisciplinary research that has repeatedly shed light on the complex relationships between humans and plants in prehistory. The preservation of organic matter is so exceptional that well identifiable plant macro- and micro-remains, zoological remains, as well as molecular residues, lipids, and ancient DNA are recovered.

Well preserved pollen grains were extracted by sediments and coprolites accumulated into the site. Among them, some multiporate pollen of Poaceae were extracted for the first time, an interesting anomaly that has never been reported in the Holocene Sahara (Mercuri et al. 2022). Poaceae multiporate pollen is known to be an effect of reproductive cycle abnormalities; it is often related to high levels of hybridization, polyploidy and apomixis. The occurrence of this anomaly in Poaceae pollen has been connected to plasticity of the grass species, and to their ability to reply to environmental stresses.

Takarkori's multiporate pollen was found in the pollen sequence from the site, mainly concentrated in the Late Acacus foragers (~10,170 - ~8180 cal BP) and Middle Pastoral herders (~7160 - ~5610 cal BP), and in coprolites of ovicaprines dated to ~9500-5700 cal BP (di Lernia et al. 2019). Its presence reveals that Poaceae that lived in central Sahara have tackled several environmental stresses, under climate or anthropogenic change pressures, during the early and middle Holocene. The highest amount of multiporate Poaceae pollen in coprolites was found in samples taken from the area of an enclosure of young Barbary sheep, dated to the Late Acacus (early Holocene) period. This strongly suggests that the fodder collected to feed the animals was repeatedly selected from high stands of weed and wild cereals in the area, like those known by hunter-gatherers and repeatedly visited to gather wild cereals for food, and that this was a form of management strategy originating from a deep knowledge of environmental dynamics.

## References

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Mercuri A.M., Clò E., Florenzano A., 2022. Multiporate pollen of Poaceae as bioindicator of environmental stress: first archaeobotanical evidence from the early–middle Holocene site of Takarkori in the central Sahara. *Quaternary* 5(4), 41; <https://doi.org/10.3390/quat5040041>

Rotunno R., Mercuri A.M., Florenzano A., Zerboni A., di Lernia S., 2019. Coprolites from rock shelters: hunter-gatherers "herding" Barbary sheep in the Early Holocene Sahara. *Journal of African Archaeology* 17, 76-94; <https://doi.org/10.1163/21915784-20190005>.

**Keywords:** anomalous pollen, wild cereals, desert, climate change, hunter\_gatherer\_fishers, pastoralists, coprolites

# Shaqadud Archaeology Project – Questions, approaches and preliminary results of an interdisciplinary research project

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The climatic amelioration after the last ice age labelled as the African Humid Period (AHP, ~14,700–4200 cal BP) allowed expansion of vegetation, animals, and people into vast barren regions of Africa, including the Sahelo-Saharan region. Later, during the later AHP, North Africa experienced a progressive climatic deterioration and a succession of arid-climate ecosystems. The Shaqadud Archaeology Project focuses on the Holocene development of hinterland savanna areas, i.e., the areas away from rivers and lakes. They lack aquatic resources as well as natural buffers against dry climatic oscillations. In prehistory, hinterlands could have occupied no less than ~80% of the terrestrial surface of northern Africa. However, the previous research in the Sahel has focused predominantly on riverine and lacustrine areas. Thus, it is so far unknown when the succession of savanna-type ecosystems began in the vast hinterlands, as well as how fast the changes were and what specific vegetation grew there. Shaqadud is an area of sandstone hills lying up to 80–100 km east of the Nile in Western Butana, Sudan. Shaqadud prehistoric site represents, in this context, a unique opportunity to study deep, well-preserved and stratified profiles dating back to the beginning of the Holocene. It contains relics of several successive prehistoric hunter-gatherer and early-herding cultures that were able to sustain in the area for centuries and millennia. Dozens of (extinct) freshwater springs and seeps, revealed by our expedition in 2021, were certainly of great importance for local occupation in prehistory. The relics of these springs (spring tufa and travertine deposits) constitute an excellent proxy for reconstruction of humidity and temperature conditions during the AHP.

**Keywords:** African Humid Period, Hinterland savanna areas, Holocene vegetation succession, Sahel, Subsistence

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# **CROP DOMESTICATION AND DISPERSAL**

# New Findings from Jebel Moya: the earliest evidence for domesticated Sorghum and animal husbandry

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This paper will present new archaeobotanical analysis from the site of Jebel Moya, lead by Michael Brass (University College London) and Ahmed H. Adam (University of Khartoum). Jebel Moya is the largest-known pastoral cemetery in Sub-Saharan Africa, providing scope to investigate the interactions between indigenous pastoral and external traditions on the southern boundary of the contemporaneous Meroitic State (Brass et al. 2018). New findings and radiocarbon dating from the 2017 seasons have pushed back the earliest dates for domesticated sorghum and goat/sheep and cattle to ca. 2500 BCE (Brass et al. 2019). Based on stratigraphy, materials from the 2019 and 2020 seasons are expected to be contemporary or even older than this. In addition, clay animal figurines of yoked cows, yoked bovines, and sheep have been found at the site (Gregory 2021). Based on these early results, it has been hypothesized that Jebel Moya represents a community with both a mobile pastoral component and a component of sedentary agricultural activity – the earliest of such sites found in sub-Saharan Africa to date and a key site to further understand the transition to sorghum-based agro-pastoralism. This presentation will focus on new unpublished archaeobotanical findings from the site, expanding on the 2018 preliminary report. It will include further morphological studies on the relatively abundant *Sorghum* chaff, as well as an assessment of potential cooked food and parenchyma remains.

**Keywords:** Jebel Moya, Meroitic State, agro, pastoralism, sorghum, domestication

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<sup>a</sup>Speaker

# Domestication of African food trees: genetic perspectives

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The influence of man on the biogeographic and domestication history of African food trees is barely known. The historical use of food trees is attested by archaeological remains in ancient human settlements (e.g., soil charcoal and charred botanical remains of trees such as *Elaeis guineensis*, *Coula edulis*, *Antrocaryon klaineianum*, *Canarium schweinfurthii*). Yet, to date, the contribution of genetics to the understanding of the domestication history of these species in the Central African rainforest remains limited. We present new and preliminary results obtained on the spatial distribution of the genetic diversity of two important food tree species from the region: *Dacryodes edulis* (Burseraceae) and *Garcinia kola* (Clusiaceae). We use nuclear (microsatellites) as well as chloroplastic DNA to map the genetic diversity distribution of these two species in Central Africa. We tentatively discuss these results in relation to species' domestication history and we also present the different challenges that are faced to conduct the research and to interpret the results.

**Keywords:** Food trees, African rainforests, Non, timber forest products, Domestication, Safoutier, Kolatier

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<sup>a</sup>Speaker

# Waymarks in the Sudanese Long durée: developments in sorghum agro-pastoral economies from domestication to the Meroitic savannah state and beyond

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Historically sorghum has been a key cereal in Sudanese history, as elsewhere in Africa. This paper will assess our current understanding of four economic transformations in sorghum economies in the central and northern Sudan. First, we consider the emerging picture of sorghum domestication as a multi-millennial process represented in spikelet bases and grain shape data (especially 4th and third millennia BCE). Second we unpick the implication of the integration of domesticated livestock with sorghum agriculture, a case of *cattle after crops*, in the third millennium BC, and how this offers contrasts from elsewhere in Africa. Third, we consider the importance of sorghum in underpinning urbanization and state expansion in the Meroitic period (350 BC-AD 350), alongside investment in pastoral production through water reservoirs (*hafirs*) culminating in an integration with pastoralism in the third millennium BC. This era also provides the first evidence for the diversification of sorghum into races that were more productive and/or less labour-demanding to process (free-threshing). Sorghum becomes the lead cereal in a diversified economy of not just staple foods but commodity crops as well (especially cotton). Fourth, we consider the subsequent role of sorghum in diversifying wheat and barley agriculture, such as in post-Meroitic Nubia or late Roman oases, a role which would fuel a further sequence of geographical expansions throughout the more temperate zones as part of what has often been labelled as an "Islamic agricultural revolution". Key questions for each of these sorghum epochs are identified that require problem-oriented archaeobotanical research.

**Keywords:** Agricultural origins, Nubia, Sorghum bicolor, domestication, urbanization

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<sup>a</sup>Speaker



# Origin of the cultivated sorghum in Africa

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While multiple African crops have been suggested to have originated from Western Africa, archeobotanical data suggest an Eastern Africa origin for the cultivated sorghum. Here, we used a combination of archeobotanical and genomic data to investigate the origin and spread of the cultivated sorghum in Africa. We sequenced 60 new wild samples and combined them with a georeferenced dataset of 210 cultivated sorghum representative of the diversity in Africa. Our analyses allowed us to build a probability map of origin of sorghum domestication in Eastern Africa. Calibrating our model using archeological remains, we dated the onset of the expansion of sorghum agriculture around 5,500 years ago. We also identified that wild-cultivated gene flow led to the emergence of a particular group of cultivated accessions, leading to a more complex history of the origin and diffusion of sorghum.

**Keywords:** Domestication, sorghum origin and diffusion, crop to wild gene flow, population genomics

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<sup>a</sup>Speaker

# Domestication and diversification in Ethiopian enset (*Ensete ventricosum*)

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The Ethiopian false banana, enset (*Ensete ventricosum*, Musaceae), a relative of sweet bananas and plantains, is a giant perennial herb grown widely in southern Ethiopia for its starchy pseudostem and corm, as well as for use as a fibre, packaging, and medicinal plant. A staple food in southwest Ethiopia for some 20 million people, where it grows across a wide range of altitudinal and ecological gradients, it is called the ‘tree against hunger’ because of its reliability even under conditions of environmental stress. Our interdisciplinary project ‘Evolutionary dynamics of vegetative agriculture in the Ethiopian Highlands’ is integrating archaeobotany, ethnobotany and historical approaches, genomics and biogeography to understand how enset has been domesticated and diversified in the context of vegetative agriculture in Ethiopia.

Although the wild form of enset is widely distributed through eastern and southern Africa, enset has only been domesticated in the Ethiopian highlands. The history of its cultivation is obscure, although Musaceae remains, which could be wild or domesticated enset, were found in the Kumali rockshelter in southwest Ethiopia from levels above charcoal dated to 1740 bp (1). Domestication traits include reduced sexual reproduction, improved palatability, and the selection of triploid lineages, paralleling the domestication of the related banana (*Musa*).

In the last few years, the sequencing of the enset genome has opened the way for genetic research on this crop, which will advance understanding of its domestication, and facilitate crop improvement to ensure food security in southwest Ethiopia despite changing climate and fungal pathogen threats. In this talk we present early results from resequencing around 700 domesticated and 100 wild samples, representing the diversity of enset in Ethiopia. This presentation will discuss how population genomic analysis helps understand enset evolution under domestication, including population structure, demographic history, environmental adaptation, and domestication traits. The development of genomic resources also opens up potential for integrating ancient DNA analysis of herbarium and archaeological enset to improve knowledge of enset cultivation chronology.

(1) Hildebrand, EA, Brandt, SA, Lesur-Gebremariam J. Afr Archaeol Rev (2010) 27:255–289. DOI 10.1007/s10437-010-9079-8

**Keywords:** Enset, Ethiopia, banana, Musaceae, perennial crops

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<sup>a</sup>Speaker

# Early evidence of domesticated yam (*Dioscorea* sp.) management at Tse Dura rock shelter, Middle Benue Valley, Nigeria

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We offer the first dated direct archaeobotanical evidence that the management of yams (*Dioscorea* sp.) as a food resource occurred at the site of Tse Dura rock shelter (the local name for which is Indyer Mbakuv) in the Middle Benue Valley, central Nigeria, from at least 933 ±29-802 ±29 BP. The intermittent occupations at this site during the Later Stone Age-Iron Age (LSA-IA) have been direct-dated using botanical remains. Analysis of charred starchy plant remains has identified reproductive characteristics that both in cell morphology and reproductive phase are unique to yams (*Dioscorea* sp.). The identification of this reproductive morphology and phase represents a novel contribution to the archaeobotanical method. From this evidence we infer that yams (*Dioscorea* sp.), most likely *D. rotundata*, was being propagated by the occupants of the Tse Dura rock shelter or ancestors of the Tiv people a thousand years ago; a period that saw the arrival of the Tiv in the hills in the Middle Benue Valley. Keywords: Tiv; Yams/*Dioscorea*; Parenchyma; Propagation; Reproduction; Dormancy; Nigeria

**Keywords:** Tiv, Yams/*Dioscorea*, Parenchyma, Propagation, Reproduction, Dormancy, Nigeria

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# The use of MicroCT scanning on pottery sherds to investigate the domestication of sorghum in Eastern Sudan and pearl millet in Northern Mali

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A pioneering new technique was used to "look inside" ancient pottery sherds to identify plant remains used to temper the clay shedding light on the presence and domestication of sorghum (*Sorghum bicolor*) in northeast Africa and pearl millet (*Pennisetum glaucum*) in West Africa. The non-destructive technique developed at the Australian National University uses MicroCT to create computerized topographies of plant remains, allowing for more precise identifications of cereal chaff and grains. The method was applied firstly to sherds associated with sorghum from Khashm el Girba in eastern Sudan, a site dating from 3700-2900 BC (Barron et al. 2020 J Archaeol Sci 123), and most recently to sherds associated with pearl millet from a number of sites in northern Mali dating from the 5th to the 3rd millennium BC (Fuller et al. 2021, Afr Archaeol Rev 38).

These analyses provided a greater amount of information from each individual sherd than is usually gained from the study of plant impressions. For sorghum it showed that non-shattering spikelets were dominant in sherds from the lowest levels at Khashm el Girba. This suggests potentially a much earlier date for the cultivation and domestication of sorghum dating commencing before 3000 BC. For the sites in Mali it indicated that cultivation of pearl millet likely began at least by the 4th millennium BC, with the fixation of shattering panicles by 2000 BC.

**Keywords:** MicroCT domestication Pearl millet sorghum

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<sup>a</sup>Speaker

# **PLANT USES FOR FOOD AND CRAFT ACTIVITIES**

# DAILY PRACTICES OF FOOD IN LIKPE KUKURANTUMI EARTHWORK SETTLEMENT, GHANA

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There are few archaeobotanical studies on the impact of regional foodways on the Atlantic trade and the movement of American crops to the African coast. However, to characterize the full extent of processes that lead to the current social position of American crops within local foodways in Ghana, there is a need to investigate the pre-Atlantic era. Archaeological and interdisciplinary research is necessary to characterize the full extent of processes that lead to the current social position of American crops within local foodways. Archaeologists cannot ignore studies on Earthworks to understand the pre-Atlantic period of Ghana's history. This paper presents a preliminary overview of the archaeobotanical research conducted at the pre-Atlantic abandoned settlement of the Like Kukurantumi Earthwork in the contemporary people of Likpe in the Oti Region of Ghana. In this research, I work closely with the Laboratory of Archaeobotany and Paleoecology at the University of South Bohemia, the African Archaeobotany Department at Goethe Institute Frankfurt, and the Likpe Kukurantumi community to understand the foodways and how the people of the past interacted with their environment. The indigenous knowledge holders are community knowledge holders of Likpe Kukurantumi. This study contributes new empirical evidence that documents some of the evolution of West African food traditions during the past two millennia through the analysis of archaeobotanical samples of the study area. Data from the study shows the archaeobotanical remains recovered from the study area. This research is timely because it contributes to knowledge and the discourse on the foodways during the pre-Atlantic era.

**Keywords:** Foodways, Earthworks, Archaeobotany, Daily practices

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<sup>a</sup>Speaker

# Evolutionary dynamics of vegetative agriculture in the Ethiopian Highlands: the archaeobotany of Enset

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The EDVEAH Project (*Evolutionary dynamics of vegetative agriculture in the Ethiopian Highlands*) seeks to address fundamental questions on how the evolutionary history of vegetative agriculture has given rise to contemporary diversity patterns, and its relationship to ecological and sociocultural history. The research focuses on enset (*Ensete ventricosum*), a food security crop of the Ethiopian Highlands which supports some of the densest populations in sub-Saharan Africa and is the staple for 20 million people.

Our major objective is to test whether vegetative landrace patterning or distribution of enset crop diversity is primarily evolved through environmental adaptation, cultural mechanisms, or antiquity of exploitation. To deliver this, our interdisciplinary team combines expertise in plant genetic diversity at Royal Botanic Gardens Kew with archaeobotany at the UCL Institute of Archaeology.

This paper provides preliminary results of the ethnographic and archaeobotanical work undertaken at Kew Gardens and UCL Institute of Archaeology. Long-term evidence for enset agriculture will come from key archaeological sequences, already collected across a series of sites in the Ethiopian Highlands. However, to interpret these remains, we must first undertake a comparative study of phytoliths considered against phylogenetic position and potential plasticity due to the growth environment. Ethnobotanical survey is being used to both assess recent historical changes in enset use and to inform on how cultivated varieties and crop processing traditions may affect phytolith variation on archaeological sites. Thirty enset leaf samples collected by Kew Gardens, including wild and cultivated, have been processed using different phytolith extraction methodologies and mounted histologically. Phytolith morphologies will be recorded in terms of qualitative and morphometric traits following recent studies of *Musa* phytoliths and imagery is being undertaken using standard binocular and scanning electron microscopy.

**Keywords:** Ensete ventricosum, food security crop, phytoliths, ethnobotany, Ethiopia, Musa, reference collection, crop processing

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# New development in the archaeobotany of southeast Nigeria

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In Africa, Nigeria is crucial in contributing to the wider narrative of African environmental and agricultural history as it stretches across many ecological zones which are potential source regions for many African crops. However, not much data has been tapped from these diverse ecological zones due to paucity and uneven distribution of archaeobotanical studies in the different parts of the country. Whilst the northern and southwestern parts of Nigeria have a higher record of archaeobotanical research conducted, only little is done in southeastern Nigeria. This paper highlights the progress made so far in the development of archaeobotanical research in southeast Nigeria, an area which holds one of the earliest complex societies in Nigeria. One of the major breakthroughs in archaeobotanical studies in the southeast region is the recent establishment of the second archaeobotany laboratory in Nigeria at the Department of Archaeology and Tourism, University of Nigeria Nsukka. The laboratory is a product of the Igbo-Ukwu archaeology project for teaching and research. Recent micro and macro botanical studies conducted at Igbo-Ukwu have provided insights into landscape history, plants exploited by early settlers and antiquity of plant use. These developments show high potential for further archaeobotanical studies in the region.

**Keywords:** Igbo Ukwu, southeast Nigeria, pollen, fungal spores, *Elaeis guineensis*, Food residue

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# New archaeobotanical data from the Mesolithic in the Eastern Sudan

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The eastern Sudan has been identified as a key region for understanding the domestication process and geographical dispersal of sorghum in the period between the 4th and the 1st millennia BC. Contrariwise little is still known about the role of this and other plants used by Mesolithic communities in the area during the 5th millennium BC (Malawiya Group, Saroba Phase). In 2015, the Italian Archaeological Expedition to the Eastern Sudan of the University of Naples “L’Orientale” and ISMEO has begun the excavation of the site UA50, where previous field surveys allowed the identification of Pre-Saroba materials. The main aims of this new archaeological investigation were to provide information on this little-known Mesolithic period and to obtain new information on the human-environment interaction in the region in the 6th (Amm Adam Group, Pre-Saroba Phase) and 5th (Malawiya Group, Saroba Phase) millennia BC. For these goals, a new pilot archaeobotanical research was launched following two distinct lines of investigations in the exploration of the excavation units UA50 IX and X, in 2019. The first involved the recovery and study of plant remains from soil samples collected during the excavation of the archaeological evidence at the site. The second examined another kind of evidence on plant exploitation, such as impressions on baked clay lumps retrieved during the excavation. The first results pointed to the exploitation of millets, other grasses, and some wild fruits, underscoring the widespread practice of utilizing a range of edible wild plants.

**Keywords:** Palaeoethnobotany, Eastern Sudan, plant exploitation, Malawiya Group

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<sup>a</sup>Speaker

# Ebony or not ebony? The case of the blackwoods discovered by the Western Wadis archaeological mission (NKRF/University of Cambridge) located in Luxor area, Egypt.

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The ancient Egyptians used the term *hebeni*, which is translated as "ebony", to designate the black woods used to make furniture. This term "hebeni", although we know that it refers to a dense black wood, raises the question of its identification with a specific species. Indeed, the ancient Egyptians generally defined materials by a term referring to their color or function. For the ancient terminology of wood species, it seems that another parameter comes into play: the term used does not refer to the color of the wood: indeed *hebeni* does not mean "black" which is said *kem*, from which the ancient name of Egypt, *Kemet*, the black earth, is derived. Thus the term *hebeni*, from which our word ebony is derived, could refer to several types of black, dense and grained wood. In the archaeological furniture preserved, many objects use these black woods generally considered as ebony wood for lack of xylological analysis. Objects made of black "hebeni" wood are represented on the walls of funeral chapels, signifying the prestige of their owners. These black wood objects are always represented with lighter brown veins (sometimes awkwardly as here at the bottom left of the screen) but always ostensibly insisting on the very nature of these precious woods. The precise identification of the species used in ancient Egypt is problematic for several reasons: firstly, access to archaeological material and secondly, obtaining authorisation to carry out anatomical analyses of the species used. However, this field of research is developing and today, thanks to the portability of equipment, it is possible to carry out analyses in the field. Black woods are generally used for the manufacture of precious objects, making them even more difficult to access. The hardness of these woods makes anatomical analysis even more delicate as it is almost impossible to take a sample directly from the wood with a razor blade. To address this issue, a new analytical protocol has been tested in the field, offering the possibility to analyse these dense woods without damaging the archaeological material. This lecture will present the field-tested protocol and the results obtained on the blackwood furniture discovered within the Egyptian-British Western Wadi mission led by Piers Litherland (NKRF/University of Cambridge) in the West Bank of Luxor.

**Keywords:** wood analysis, ebony, Egypt, blackwood, new analytical protocol, 2nd Millenium BC, royal equipment

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<sup>a</sup>Speaker

# From the present to the past, reconstructing foodways in Senegal (West Africa) by the analysis of phytoliths in ceramic pots.

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Because it may be used for storing, transporting, preparing and serving food commodities, pottery represents a key evidence of the food practices of past societies. However, the plant content of archaeological pottery is difficult to track because of (i) the low preservation of their molecular biomarkers in organic residues, (ii) the scarcity of well-preserved botanical remains and (iii) the lack of interpretative references.

This communication aims at presenting the potential and limits of phytoliths as an indicator of plant content of pots and culinary practices of past societies. Because of their siliceous structure, phytoliths offer new perspectives for identifying plants remains in organic residue, where other biological and molecular indicators are poorly preserved. Differentiating the parts of plants and Poaceae subfamilies may furthermore supply detailed information about the substances prepared inside pottery (seeds, leaves, roots, etc.). However, studies are limited because of the lack of interpretative references. The building of a modern reference on plants used in cooking recipes bring new knowledge about phytoliths production according plants or parts of plants. Such approach is nevertheless quite challenging since, before interpreting the data in terms of foodways, it is important to distinguish the phytoliths issued from pottery use from those from the environment.

This study focuses on the phytoliths analysis of the residues from more than 150 samples coming from ethnographic and archaeological pots from Senegal. These were collected in two present-day communities in Casamance and Bedik Country representing two regions with different traditional food systems, according to their farming practices (rice farming vs rainfed agriculture). This study has been developed in the framework of an international research program with a wider perspective of establishing an ethnoarchaeological reference of the functions of pottery that combines different approach (morphometrical study, organic residue, phytoliths and use-wear analysis).

The first results highlight a good signal of phytolith assemblages according to the content of the

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pots. Phytoliths are particularly useful for documenting the culinary practices from cereals, that is not always perceptible by the other proxies and are complementary of the other information. This multidisciplinary and exploratory approach has been applied to the archeological samples of a dumping site "La Poubelle des mamans" dated from the XXth century.

**Keywords:** Phytoliths, Foodways, Senegal, Ceramic pots

# Prehispanic basketry from the Canary Islands: preliminary data on plants used and techniques.

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The Canarian archipelago constitutes a relevant case of study to evaluate the dynamics established between the aboriginal groups that colonised the islands from Northern Africa during the first millennium AD, the technology developed and the natural resources used and offered by these environments. Prehispanic archaeobotanical analyses in the Canary Islands have traditionally focused on anthracological and carpological remains. Recently, the analysis of wooden artefacts from a technological perspective has been added. However, Prehispanic basketry and cordage remains have not been studied in depth since the publication of a typological proposal by Galván (1980). Although these plant-based artefacts are rarely preserved in archaeological contexts, the Canarian dry conditions allowed their exceptional preservation, especially in the island of Gran Canaria. These archaeobotanical remains could be the result of the successful intergenerational transmission of plant management strategies through processes of accumulated ecological knowledge. Since 2022, an interdisciplinary approach based on archaeobotany, experimental archaeology and tool-mark and wear analyses has been applied to study the production and usage of plant-based artefacts in this chronocultural context within the framework of the ForestImpact project (Spanish Ministry of Science, PID2021-125055NA-I00). One of the research lines under development is the analysis of the large set of basketry and other worked fibre artefacts stored at El Museo Canario (Gran Canaria, Spain). In this oral communication, preliminary data is presented on the analysis of the Prehispanic *tehuetes* which are small basketry bags recovered in different geographical locations of Gran Canaria. Our analyses are focused on the craft techniques involved in the manufacturing of these basketry elements, with special attention to the raw material selection and treatment. With this aim, the first step is the creation of a reference collection of the Canary Island weaving plant. The identification of the plant raw materials used for manufacturing the archaeological basketry has been carried out by optical microscopy observation and the technical analysis is based on an experimental approach. The first results indicate that some *tehuetes* from distant points of the island's geography show similar production techniques probably indicating common handicraft production processes and expressing material cultural identities.

**Keywords:** Basketry, Vegetal fibres, Prehispanic, Canary Islands, Archaeobotany

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# Discussing the archaeobotanical evidence of the Nok culture in central Nigeria, 1500-1 BCE

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The Nok culture, known for its eponymous terracotta figures, occupied the savanna-forest ecotone in central Nigeria from c. 1500 BCE and introduced pearl millet (*Cenchrus americanus*, syn. *Pennisetum glaucum*), domesticated earlier in the arid northern grass-dominated savannas, into the more southern woodlands. Archaeological, archaeobotanical and biomolecular evidence attest to a lifestyle combining foraging for fruits and leaves, bee products and hunting, together with the cultivation of at least two crops, pearl millet and cowpea (*Vigna unguiculata*). Food preparation included the processing of various plant types and plant parts, including leafy vegetables as well as possibly underground storage organs. Lipid evidence for plant oils, as produced by canarium fruits (*Canarium schweinfurthii*), is absent. However, canarium endocarps are ubiquitously present in the macro-botanical record, which might indicate the raw consumption of these tree fruits. Based on the systematic absence of pearl millet chaff and in connection with the archaeological evidence, we have proposed that most excavated Nok sites were consumer sites where clean grain was brought in from outside and consumed in a ritual context connected with feasting. This might also explain the relative paucity of the macro-remains record in comparison to other contemporary sites.

In the presentation, we will discuss the peculiarities of the Nok culture archaeobotanical evidence and put the results into a wider spatial and temporal perspective within Western Africa.

**Keywords:** Pearl millet, foraging, feasting, ritual context, West Africa

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<sup>a</sup>Speaker

# Reconsidering early agricultural transmissions in the Middle Nile Valley: New dietary data from Kadruka 1 and Kadruka 21, Sudan

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Rare finds of Southwest Asian cereals primarily derived from funerary contexts in Upper Nubia and Central Sudan continue to generate discussions concerning the configuration of Neolithic economies and whether local agricultural production formed part of initial responses to climate change. However, the context of these finds and lack of large-scale integrated studies presents a major barrier to understanding diachronic changes in plant use and dietary breadth. This paper presents recent findings from analyses of human dental calculus and dietary isotopes from Kadruka 1 and Kadruka 21 that contextualise domesticated cereals previously reported in associated graves. In line with emerging trends highlighting subsistence flexibility and the variable use of domesticates by early food producers, these results necessitate a reconsideration of the economic significance of early funerary evidence in the Middle Nile region and the timing of agricultural transmissions.

**Keywords:** Upper Nubia, Middle Neolithic, Kerma, phytoliths, starch granules, stable isotopes, dental calculus

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<sup>a</sup>Speaker

# Too many large ceramic vessels and grinding stones: decoding the centrality of beers among the Ngoni in Southern Tanzania

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The Ngoni of southern Tanzania are known for significant alcohol consumption. Local brews thus feature prominently in their various socio-cultural milieus such as in performing rituals, mourning, weddings, rites of passage, and post-harvest ceremonies. Our archaeological research at the abandoned Ngoni's earliest settlements of Mbinga Mharule (1850s – 1890s) and Ndirima (1890s – 1970s) yielded abundant and extraordinarily large ceramic vessels, also recorded dozens of grinding stones. The ongoing archaeobotanical analysis of floated soil samples from the two sites has yielded carbonised maize and millets-like remains. The dominance of these materials contrasts the records at the contemporaneous nearby non-Ngoni settlements such as Mang'ua and Kikole. This paper will present and discuss these patterns to inform how the past food cultures reflect in material remains and, in way, the social identities.

**Keywords:** archaeobotany, local brew, social identities, Ngoni, Southern Tanzania

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# Botanical Grave Goods from a Late Antique Child Burial from the so-called Temple of Ceres, Mustis (N. Tunisia)

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The Roman municipium Mustis (N. Tunisia) was founded at the end of the 2nd century BC in the area later called Africa Proconsularis and existed as a city until the 11th century AD. It was located in a strategic position, on one of the main roads between Carthage and Theveste. During its long history, many monumental buildings of a sacred, secular or defensive nature were erected there. One of those is the so-called Temple of Ceres, excavated in 2022 as part of the Tunisian-Polish project (*Reading*) *African Palimpsest. The dynamics of urban and rural communities of Numidian and Roman Mustis (AFRIPAL)* led by Prof. Tomasz Waliszewski from the Polish Centre of Mediterranean Archaeology, University of Warsaw, and Jamel el-Hajji from the Institut National du Patrimoine (Tunis). A burial pit with the child's remains was discovered there, located on the axis of the temple almost in a north-south orientation. The tomb was covered with three ceramic tiles (*tegulae*). Stratigraphy allowed to date it to the late 5th - early 6th century AD. This fits in with the trends taking place in North Africa from the 4th century onwards, but especially from the Vandal period (5th century AD), when single burials are found *intra muros* in houses, temples, churches, etc. as is the case, for example, at Bulla Regia or Hippo Regius. In order to fully understand the burial, archaeobotanical samples were taken from the bottom and the fill. Analysis of the macroremains revealed the presence of cultivated plants such as *Triticum aestivum/durum*, *Hordeum vulgare*, *Olea europaea*, *Lens culinaris* and segetal or ruderal weeds from the families Boraginaceae and Malvaceae, which were part of the natural plant communities. The remains bear traces of intensive burning and the fact that they were exceptionally abundant compared to macroremains from other contexts of the excavation suggests that they may have been deposited as a type of grave goods. The importance of the research carried out at Mustis is underlined by the fact that it is the second archaeobotanical burial study carried out on Tunisian sites, after Leptiminus, which was located on the east coast.

**Keywords:** Mustis, Africa Proconsularis, Late Antiquity, Plant remains, Grave goods, Child burial

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# **AGROPASTORAL AND HOUSEHOLD PRACTICES**

# Agriculture and Diet in Cameroon During the Early Iron Age (ca. 500–200 BC)

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Archaeology in Western Central Africa is slowly revealing its complex history. In the current context of declining biodiversity (including agro-diversity) it is becoming urgent to understand the history of agriculture in Central Africa and its past strategies in order to improve current food security and to find resilient solutions for the future.

In this paper we present the preliminary archaeobotanical results (macro remains and starch grains) recovered from 19 archaeological sites dated to the Early Iron Age (ca. 500–200 BC) and the modern period (ca. 1800 AD) located 70 km north of Yaoundé and discovered on a dam construction site. The rescue archaeology program on the Nachtigal Amont hydroelectric dam site conducted by a Franco-Cameroonian IRD (Institut de Recherche pour le Développement) team has to date documented more than 161 archaeological sites across more than 721 hectares. In total, 50 archaeobotanical samples (for a total of 483.5 litres of soil) and 23 potsherds were analysed. The results suggest that agriculture based on the West-African package comprising pearl millet (*Pennisetum glaucum*) and cowpea (*Vigna unguiculata*) was introduced during the Early Iron Age and that the local diet was composed of cereals, legumes, oil-rich seeds (*Canarium schweinfurthii* and *Elaeis guineensis*) as well as tubers (*Dioscorea* ssp.).

**Keywords:** Pearl millet, Cameroun, starch grain, macro, remains

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<sup>a</sup>Speaker

# Archaeobotany of the Egyptian Delta: State of Research

Mennat-Allah El Dorry <sup>a 1,2</sup>, Charlène Bouchaud <sup>3</sup>, Aline Emery Barbier <sup>4</sup>, Claire Malleson <sup>5</sup>, Claire Newton <sup>6</sup>, Clémence Pagnoux <sup>3</sup>

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Despite archaeobotany's long history in Egypt, starting the late nineteenth century, it was not until the 1980s that archaeobotanical analysis took off in the Nile Delta. This paper will present an overview of the history of archaeobotanical research in the Delta specifically, with the mention of a few case studies from the Delta. In Merimde Beni Salama, for example, the research is oriented towards better understanding the arrival of domesticated cereals and agriculture in Pharonic Egypt. At Buto, early contexts on the site from the Pre- and Early Dynastic provide a chance to understand the environment and plant exploitation at this pivotal moment in Egyptian history. Roman contexts from Bouto further inform our understanding of agricultural practices and storage of cereals. At Plinthine, the analysis explores agricultural land, viticulture and fuel management, especially between the New Kingdom and Early Roman Period. At the ninth-tenth century AD monastic settlement of St John the Little in Wadi al-Natrun, the foodways and agricultural practices of the monks living in the arid desert are the focus of the archaeobotanical investigations. This communication will present the diversity of the research questions that archaeobotanical investigations have tackled in the Delta, highlighting the importance of continued botanical research in this area.

**Keywords:** Macroremains, Egypt, Delta

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<sup>a</sup>Speaker

# Identifying patterns of plant "waste accumulation" in House 169, Elephantine Island, Egypt (1773–1650 BCE) using Machine Learning.

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The exceptionally well-preserved multi-period settlement, cemeteries, and temples on Elephantine Island (Aswan, Egypt – 1st Nile cataract) have been under investigation by the German Institute for over fifty years. The location of the settlement site on an island well above the highest Nile flood level in one of the most arid regions in Africa yields near-perfect preservation of organic remains. Between 2013-2019, the "Realities of Life" project focussed excavations on House 169 which was identified as a single house unit via recognition of abandonment layers / phases separating it from earlier / later buildings. H169 dates to the mid-late 13th dynasty (latter part of 1773-1650 BCE).

Because the house did not experience any kind of catastrophic destruction, and was abandoned very slowly, with new houses constructed on top, we assumed that the remains found in the "occupation" deposits would be limited to waste gathered in corners, trampled into floors, and the ashes and debris left following final use of cooking / baking installations. For this reason, we anticipated that the archaeobotanical assemblage from H169 was likely a homogenous mix of debris from household activities and plants blown / brought into the house. However, because this is largely a desiccated assemblage, we were also interested in identifying spatial differences, either between rooms, or between different types of features. To do that and following the broader aims of the project-to explore as many different archaeological methods as possible-we decided to assess the potential of machine learning techniques for identification of patterns in the data.

Traditional PCA analysis indicated that the assemblage is almost totally homogeneous, with no real differences in the composition of the samples other than a few easily identified outliers. However, the results of our two-step approach in data analysis revealed some patterns. A hierarchical clustering strategy applied to the composition of the samples yielded 2 to 4 reasonably equally sized clusters among the collected samples; subsequently, evolutionary prediction trees – our additional step in Machine Learning – served to relate spatial, temporal, and functional variables to cluster membership. The fit metrics associated with the predictive trees indicate a robust tie between the site characteristics and the samples associated with each cluster. In this way, the resulting tie between spatial/temporal/functional properties of the site and sample clusters serves to achieve our stated goal of finding patterns even within a largely homogenous assemblage.

**Keywords:** Egypt, settlement, household, machine learning, data analysis

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<sup>a</sup>Speaker

# Food globalisation and indigenous agricultural resilience in the 15th-17th centuries AD: a case study from the Canary Islands

Jacob Morales <sup>ab 1</sup>, Pedro Henríquez-Valido <sup>1</sup>, Amelia Rodríguez <sup>1</sup>, María Del Cristo González-Marrero <sup>1</sup>

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The populations from the northwest of Africa that initially colonised the Canary Islands in the early centuries of the 1st millennium AD remained isolated until the arrival of European seafarers in the late 14th century AD. The earliest settlers were farmers who introduced a series of crops to the archipelago (barley, durum wheat, lentil, faba bean pea, and fig). Ultimately, after the European colonisation, new domesticated plants and animals began to arrive from Europe, Africa, and Americas.

In order to delve into the question of the introduction of new crops, this study resorted to the archaeobotanical data from the site of Cruz de la Esquina, a cave-granary on the Island of Gran Canaria spanning both the pre-Hispanic and colonial periods. The aim is to evaluate the transformations in agricultural activities resulting from the new colonial rule and to assess the resilience of the indigenous populations. The study specifically focuses on the results gleaned from Silo 9, a storage room dating to the 15th-18th centuries AD.

Among the artefacts was a large assemblage of plants preserved by desiccation: maize (*Zea mays*), cotton (*Gossypium arboreum*), and bottle gourd (*Lagenaria siceraria*). The direct radiocarbon analyses of maize samples place it in the 15th-17th century AD, presumably one of the earliest instances of this crop in the eastern Atlantic. The archaeobotanical results also suggest a continuity in the cultivation of the earlier crops (barley, durum wheat, lentil and fig) predating the arrival of the European colonists. The overall preliminary findings thus signal an early adoption of new crops as well as the continuity of certain traditional indigenous crops.

**Keywords:** Canary Islands, Colonial period, Archaeobotany, Maize, Plant exchange, Crop resilience

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# Multiproxy archaeobotanical research in medieval Fardowsa, Somaliland: evaluation of the first results.

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Fardowsa is a medieval town located in Central Somaliland, close to a mountain pass that communicates the important commercial town of Berbera with the interior of the Horn of Africa. It is a town of more than 200 houses, scattered around an area of 10 hectares, which makes of Fardowsa one of the most important settlements in the region. The site was tested in 2016, and in 2020 a large area excavation took place, which documented a compound with two large rectangular houses and some several smaller structures. The site yielded an important set of imported materials, including pottery from China, Arabia, Middle East and India, metal objects, stone rings and beads and hundreds of cowries. These materials and several radiocarbon samples have dated the site between the 14th and the 16th centuries, and have shown the importance of Fardowsa as a trade hub in the routes linking the Horn of Africa with the Indian Ocean and Middle East. In this presentation we will present the first archaeobotanical results obtained in Fardowsa. During 2020 archaeological sediments were sampled to recover and analyse both micro and macrobotanical remains. Charcoal and seeds were recovered through water flotation of archaeological soils. Moreover, soil samples for microremains analyses were recovered and allowed for pollen analysis. The main aim of this first study is: i) to evaluate the preservation of botanical remains in the site; and ii) to assess the potential of the archeobotanical record to investigate past landscape in Fardowsa and different plant uses in the medieval town (food gathering, agriculture, fuel supply, etc.).

**Keywords:** charcoal analysis, pollen analysis, seeds and fruits, medieval Somaliland

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# What about Fruit tree cultivation on the semi-arid slopes of the Anti-Atlas during the Middle Ages? Archaeobotanical data from the almohad period at Îgîlîz (southern Morocco)

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The Îgîlîz mountain fortress located at 1350 m altitude in the Anti Atlas is excavated by a Moroccan-French cooperation since 2009. The main phases of occupation date from the 11th-13th centuries. During this period, it was the place of residence of a group of devotees under the military and religious authority of Mahdi Ibn Tumart, at the origin of the Almohad Islamic movement. The archaeobotanical results from the analysis of dry subfossil woods, charcoal, fruits and seeds show the consumption of a broad spectrum of cultivated plants composed of cereals, legumes and fruit trees. Beside *Argania spinosa*, the predominant species in the archaeobotanical records, a total of 10 fruit species were recorded: *Phoenix dactylifera*, *Ficus carica*, *Vitis* and *Ziziphus* spp. attested both by woods and seeds. Only seeds attest *Ceratoniasiliqua*, *Ziziphus lotus*, *Ziziphus ziziphus* and *Punica granatum*, while only charcoal fragments attest *Olea europaea*. This diversity is unexpected in a mountainous and semi-arid environment not very favourable to the exploitation of plant resources, which require a regular supply of water. The main objective of this paper will be to comment on the spatial distribution of fruit trees remains in the contexts of occupation, on the nature of the waste and to discuss the practices and places of their exploitation.

**Keywords:** archaeobotany, agrobiodiversity, islamic times, fruit growing, food, fuel, mountain, Southern Morocco

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# An integrated approach to the study of phytoliths and thin sections from ground stone tools at elephantine, Aswan, Egypt

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The analysis of plant remains from archaeological excavations in Egypt is usually based on a study of charcoal, charred seeds, or any other vegetative parts all remains visible by naked eye. The analysis of phytoliths represents an approach not previously used in archaeological work in Egypt. Combining the results of the phytolith study with the results of the study of plant macro remains reveals the full spectrum of historically used flora, from wild plants to domesticated species. Thus, the interaction between humans and the environment in the area of the first Nile cataract is further illuminated. Ground stones are a common type of find in Egyptian settlement excavations. However, they rarely feature in publications and are almost never studied in detail despite the fact that, as critically important tools of everyday life, they have great potential to shed much light on numerous aspects of domestic household activities and by inference, the society and culture of ancient Egypt. Residues on these tools, as well as their usewear marks, provide evidence of how the stones were utilized, in some cases even how they were held during work. The pilot study presented here focuses on nine stones, retrieved from house H169 (c. 1750-1650 BCE), whose stratigraphic layers are particularly well preserved, and from deposits relating to the use of later buildings in the same location. Samples were taken from pores and crevices as well as from the surface of the finds following the method of Piperno, 2006. The most common morphotypes observed, both in the phytolith extracts and micromorphological thin sections, were bulliform phytoliths, indicative of the mesophyll or epidermis of Poaceae, most likely Phragmites. Cereal remains dominated the macro botanical assemblages, but their phytoliths were surprisingly absent from the grinding stones. Cucurbitaceae family phytoliths were found in the crevices of one stone, and wild colocynth melon was present in the macro-remains. Our current working hypothesis is that the culms of wild grasses were pounded on grinding stones to make the fibers easier to bend and weave for matting and basketry. Additionally, we are investigating the possibility that the presence of wild melon phytoliths on one stone might represent the processing of the fruits for medicinal uses. The most important outcome of this integrated approach to the study of stone tools from Elephantine has been to uproot the assumptions that grinding stones were primarily used for processing plants for consumption, leading us to revise our ideas about these everyday items, and the routine activities of life in the town.

**Keywords:** Elephantine – Middle Kingdom – Macro, botanical remains, grinding stones – use wear analysis – phytoliths

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# **COLLECTION, KNOWLEDGE, DISSEMINATION**

# Displaced rural communities and their ethnobotanical knowledge: plant species of cultural importance, collection sources and implications for conservation in the Niokolo-Koba National Park, Senegal

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The socio-cultural bond between traditional farming societies and local plant resources is inseparable. Recent societal changes are contributing to the displacement and disintegration of traditional rural communities and the rapid vanishing of ethnobotanical knowledge and other elements of great cultural and historical value. Here we study this issue in the Niokolo-Koba National Park (NKNP) in Senegal, founded in 1954 and further expanded in 1969 to 9130 km<sup>2</sup>, causing the abandonment of more than 50 villages and hamlets. Inhabitants were displaced either to newly established villages or to old traditional villages outside of the protected area. We studied the relationship between the displaced inhabitants and their environment by assessing the differences in the use and cultural importance of a selection of plant species according to the region, ethnic group and collection sites in the landscape. We selected 63 woody species based on the available literature, plant surveys and questionnaires, interviewing 63 informants in seven villages in two regions around the NKNP. Quantitative ethnobotanical indices were used to evaluate the plant use and cultural importance of plant species according to the spatial distribution of plant resources in villages, surrounding areas and the protected park area. The ethnobotanical cultural importance of plants varied spatially, mainly according to the geographical region and the type of collection sites. More than 80% of species were collected in the village surroundings, ca. 25% were collected in the park and ca. 15% in the villages. The most important plant uses were medicine, food, architecture and firewood, while economic, ritual and cosmetic uses were less important. Ethnobotanical study is essential to interpret past and present interactions between people and the landscape in living and abandoned settlements in NKNP and to better understand the archaeological context. Further efforts in documenting the

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traditional knowledge and the use of natural resources are necessary to design effective nature conservation measures and to preserve the cultural heritage in rapidly changing societies in West Africa.

**Keywords:** Conservation, Niokolo Koba National Park, plant use, quantitative ethnobotany, species cultural importance, traditional knowledge.

# The ethnobotanical collections of the French National Museum of Natural History: from their colonial origin to recent scientific projects

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The ethnobotanical collections of the French National Museum of Natural History shelter about 50,000 herbaria specimens collected from early XXth century in all continents. The collection began with the creation of the Laboratoire d’Agronomie Coloniale by Auguste Chevalier in 1911. The agronomist and their collaborators were studying useful plants and their application for economic development. Then, as the direction of the laboratory changed, the research thematic evolved to ethnobotanical issue. Nowadays, the collections reveal the emergence of this disciplinary and the multiplicity of related thematic in the institution. Recent projects aim to valorize the specimens by a numerization process in order to offer an access and visibility to these collections. Moreover, because of their origin, some specimens show an important value for current research. For example, sorghum collection (*Sorghum bicolor*), which represents about 1,000 specimens, is a precious resource to explore taxonomy and morphological properties of sorghum varieties from West Africa. This material can have applications for archeological research by supplying well identified, documented and accessible seed references.

**Keywords:** herbaria, collection, ethnobotany

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<sup>a</sup>Speaker

# Storage practices in the Moroccan Atlas: ethnographic data on cliff granaries from Aoujgal

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Storage represents a key practice in the complex phenomenon of plant food production as it guarantees provisions for short or long-term use, beyond the time when a particular resource is available. It is one of the mechanisms designed for coping with the risks and uncertainties that characterized past subsistence such as seasonal and annual climatic fluctuations, natural hazards, pests, conflicts and all sources of variability that may affect food. It is particularly in the context of large-scale storage that we aim to present ethnographic data collected in 2019 on the so-called perched or cliff granaries "grenniers à falaise", an intriguing feature that characterizes some areas of the Moroccan Atlas inhabited by nomadic tribes. The granaries are located on high vertical escarpments, taking advantage of natural ledges on which small structures made of stone walls are built. These have remained unexplored despite their potential for providing crucial information not only on economic aspects of the medieval society (storage practices, agricultural production and management), but also on the identity of the communities that used them. Interviews with past guardians and users of these structures have allowed to record a wealth of information of past practices and management of plant resources. More significant has been the possibility of sampling remains of crops preserved by desiccation.

**Keywords:** storage, Morocco, ethnography, plant resources

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<sup>a</sup>Speaker

# Seeds and their Stories: Botanical Heritage, Education, and Public Engagement in Tanzania

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Archaeological plant remains are commonly recovered through flotation from later Holocene Tanzanian archaeological sites, and botanical artifacts have been applied to a variety of important research questions about early farmer population movements, regional and global trade, cultural adoptions, urbanization, and food histories under Omani imperialism. An archaeobotanical lab has been established at the University of Dar es Salaam, making it increasingly possible to process and identify plant remains within Tanzania instead of removing remains to laboratories outside the country. Questions remain about how best to store archaeological plant remains as well as modern comparative collection material, and even whether these are the domain of archaeology units or herbaria. A heritage management perspective advocates for mobilizing archaeobotanical findings for public education, potentially in museums, botanical gardens, among other public institutions. In this presentation, I discuss building educational resources from archaeological plant remains - in general, but also specifically for the flotation samples and plant comparative samples Walshaw collected between 2002 and 2007 on Pemba Island, Tanzania. While regional museum and storage facilities support the curation of other artifact types, archaeological plant remains present both challenges and opportunities for long term storage, curatorial exhibits for public learning, and collections for further research by specialists. I aim to present updates on current projects and I look forward to learning from colleagues about their own experiences with botanical heritage, specialist training in African Universities, and public archaeobotany.

**Keywords:** Tanzania, botanical heritage, museum, laboratory

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**Prof. Ahmed G. Fahmy Memorial  
Speaker**



# Exploring agriculture and terroirs of the medieval Haouz : interdisciplinary approach at Aghmat (Morocco)

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In Morocco, the Haouz region has been the subject of important archaeological, bioarchaeological and ethnological research for more than a decade, in particular the area of Aghmat, a town of medieval origin located at the foot of the High Atlas, at the mouth of the Ourika valley. Founded around the 10th century, the city had a turbulent history, going from a dynamic economic center, ephemeral capital of the Almoravid kingdom, to a rural locality reoccupied by Sufi populations who devoted themselves to agricultural and ceramic production. Although the rapid evolution of the socio-economic (change in the status of the town, migratory waves, ruralization) and climatic (medieval optimums and peyorations) context suggest transformations in the relationship of the inhabitants to their agrosystems and to the surrounding landscapes, the latter had, until very recently, been little explored. Since 2016, the development of an interdisciplinary research project (carpological, anthracological, isotopic approach), allowed addressing the local agricultural history. Several themes are investigated: agropastoral practices (agriculture, fruit growing, fodder), domestic and artisanal practices (treatment and processing of produce, fuel economy), management and nature of the land (landscapes exploited, forest management). This paper brings together the first carpological, anthracological and isotopic results obtained from the archaeological site of Aghmat. They shed light on various aspects of the exploited plant diversity, in particular a shift of practices during the late Middle Ages, with a specialization turned towards olive growing, potentially as early as the 14th century, and a significant deforestation following this olive growing boom, which could have led to an extension of the fuel supply zone as far as the foothills of the Atlas.

**Keywords:** carpology, anthracology, stable isotopes, irrigation, manuring

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<sup>a</sup>Speaker

# One man's trash is someone else's treasure: plant remains from the tomb of the Pharaoh Tutankhamun

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The arid environmental conditions present in Egypt have allowed to perfectly preserve desiccated botanical materials from a wide range of contexts and time periods, spanning from the Predynastic Period to the Ottoman one. An interesting case study in this sense is represented by the tomb of the 18th Dynasty pharaoh Tutankhamun, who reigned between 1334 and 1325 BC. Other than the golden objects and the rich funerary assemblage, the tomb was also full of plant remains. These were found in the form of already well documented flower garlands and stored in numerous containers as funerary offerings. Nonetheless, part of these remains was left untouched for a century. In fact, after cataloguing the most interesting findings, Howard Carter and his collaborators swept the remaining material from the surfaces of the tomb, including numerous plant parts, and stored them in a wooden box, initially found in the Egyptian Museum in Cairo and recently moved to the Grand Egyptian Museum. We have had the opportunity to study the contents of this box, identifying over 9000 plant remains, including food, medicinal and ornamental plants. These include taxa not previously recorded in the tomb (such as *Beta vulgaris* L.). Overall, our study does not only provide information about funerary offerings to the king, but also provides information about plant availability in 14th century BC Egypt.

**Keywords:** Tutankhamun, plant, ancient Egypt

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# The Exploitation of cultivated and wild plants in Post-Medieval Nubia: Archaeobotanical Evidence from Old Dongola (16th-19th Centuries AD)

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Sudanese history of the 16th and 19th centuries is poorly understood due to the lack of written and archaeological evidence. This investigation gap resulted in very scarce and patchy archaeobotanical evidence. Nevertheless, few systematic archaeobotanical investigations have been conducted in Sudanese Nubia regarding plant consumption and agricultural production. We present the newly identified archaeobotanical remains from the administrative townsite of Old Dongola, the northern province's capital of the Funj Kingdom (AD 1504-1821). Since 2018 onwards, we carried out large-scale systematic archaeobotanical sampling at the citadel of Old Dongola. This strategy enabled us to reveal a huge variety of wild and cultivated plants, comprising more than 36.000 seeds belonging to 17 plant families and 36 genera from 17 occupational contexts. These new results provide a cornerstone for understanding post-medieval and early Islamic Sudanese subsistence regimes and the historic use of economic and medicinal plants. Furthermore, we discovered several imported plants in Old Dongola that represented important commodities in the trading networks of the old world.

**Keywords:** Agricultural production, Archaeobotany, Medicinal plants, Funj Kingdom, Old Dongola, Nubia, Sudan

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# Human-Environment Interactions During the Late Pleistocene and Holocene Epochs: An Analysis of Archaeological Charcoals from Three Archaeological Sites in Southern Ethiopia

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Despite the attention given to the lower Omo region of the southern Ethiopian Rift Valley, the southern part of Ethiopia is one of the regions that has received relatively little attention in archaeological research. Understanding the region's contribution to archaeology particularly localities out of the main Rift Valley area has been made possible by recent archaeological research in light of various archaeological remains originating from this region. The archaeological sites are endowed with rich archaeological materials including lithic, and faunal remains and a huge concentration of botanical remains, ceramics, charcoal, and ochre. These archaeological finds played a significant role to understand different aspects of the region such as understanding diachronic changes in technology and subsistence, food production, cultural, technological, and biological evolution, dietary system, and hunting activities. Archaeobotanical remains including charcoals collected from various sites in south Ethiopia were stored in the National Museum of Ethiopia. This thesis is proposed to examine the anthracological remains excavated from 3 archaeological sites namely Bale Mountains, Gotera, and Kumali located in the southern parts of Ethiopia. The objectives of this thesis include understanding subsistence strategies, prehistoric vegetation change, woodland management, palaeoenvironment reconstruction, and hunter-gatherer interaction with their environments. The result of this study is expected to create more complete pictures of human and environmental interactions from the Late Pleistocene to the Holocene in the southern part of Ethiopia. The study also expects to better understand the role of the environment in human cultural transformations from the Middle to the Late Stone Age (MSA, LSA), and from hunting-gathering to early food production by using archaeobotanical remains as sources of data.

**Keywords:** Anthracology, Archaeobotany, ecological adaptations, palaeoenvironment

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# Posters

# Impact of ethnobotanical study on preservation of local plant diversity and local knowledge

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To preserve the diversity of plants, to understand and keep the knowledge and culture of populations in various regions around the world, ethnobotany is essential. Indeed, ethnobotany focuses on the interactions and relationships between plants and people over time and space. Many arid regions in southern Algeria suffer from the undesirable effects of climate change, leading to the loss of various spontaneous and endemic plant species. Our research interests in this issue underline the importance of ethnobotany for harvesting information on the biodiversity of plants in desert regions towards more sustainable living. Multiple surveys conducted in natural areas in Tamanrasset using a questionnaire developed by CRD-SAIDAL with open questions with a guide who speaks "Tamahaq" (local language spoken in Ahaggar). People of various ages (25-80), women and men, private healers and herbalists are interviewed. Information on the local name, plant parts used and recipes for illnesses is recorded. Our research provides a list of medicinal plants and their therapeutic benefits. A voucher specimen of each plant species is determined through identification keys in the field and then grouped in a herbarium. A large number of natural plant species are harvested, observed and then studied and classified into botanical families for their medicinal properties. A result of this investigation is the discovery of the rich biodiversity in the Hoggar area, as well as local names and recipes.

**Keywords:** ethnobotany, Ahaggar, plants, herbarium, biodiversity

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<sup>a</sup>Speaker

# Archaeobotanical assemblage from Old Dongola, Sudan

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This poster presents archaeobotanical results from the excavations of the site of Old Dongola, excavated by the Polish Centre of Mediterranean Archaeology, University of Warsaw for the UMMA project (Urban Metamorphosis of the Community of a Medieval African Capital City) funded by the European Research Council. The results presented here are an important body of work as they represent the wide variety of plants used by the inhabitants of Old Dongola, for food and craft, but also, these data contribute to our limited knowledge of Nubian archaeobotany.

Archaeobotanical sampling targetted areas of the city of Old Dongola, including residential spaces, spaces used for animal related activities, courtyards, dumped deposits and specific contexts such as hearths, infills of baskets and vessels. The period covered by the archaeobotanical investigations in this report is the second half of the 15th to the 19th centuries AD. The organic remains found represent a wide range of food crops (human and for fodder), some plants used in craft production and weedy or wild plants which may represent farming techniques or the ecology surrounding the area where the city was located. Preservation is particularly good in this site with more than 70% of the assemblage preserved in desiccated form.

The staple food in Old Dongola is sorghum (*Sorghum bicolor*). This cereal is the most visible of all economic crops in frequency and ubiquity. Based on ubiquity, cereals are the most visible taxa, and this is probably due to their importance as food, but also crop processing of cereals leaves a good trace in the archaeological record since dehusking is normally done close to households or occupation areas, and preserve well. Weeds of cultivation are also found in abundance and across many contexts (e.g. *Echinochloa* and *Digitaria*) and these may also be as a result of crop processing, where weeds are winnowed in close proximity to houses. In terms of frequency, cucurbits and cereals are well represented in the assemblage. Other botanical remains of interest include barley (*Hordeum vulgare*), wheat (*Triticum aestivum*) cucurbits (*Citrullus* sp., *Cucumis melo* and *Cucumis sativus*), dates (*Phoenix dactylifera*), whole desiccated maize (*Zea mays*) cobs and doum palm (*Hyphaene* cf. *thebaica*).

**Keywords:** Sudan, Nubian archaeology, desiccated, sorghum, cucurbits, maize, weeds

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# Archaeobotanical findings from Jebel Barkal (Sudan)

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This poster will present the recent archaeobotanical findings from the Jebel Barkal Archaeological Project, lead by Geoff Emberling from the Kelsey Museum of Archaeology and El-Hassan Ahmed Mohamed of the National Corporation of Antiquities and Museums (NCAM), Sudan. The project aims to investigate non-elite lifeways and residencies in the city from Napatan through Meroitic times (7th c BCE to 3rd C. CE), with the archaeobotanical analysis focussing more specifically on resilience and change of foodways in the face of changing climatic conditions. Current results are predominantly from the 2020 season (Meroitic occupation), supplemented with materials from the 2022 and 2023 excavations which underwent flotation and analysis in 2023. The 2020 sample was relatively modest in size, with 244.2 litres of soil being sampled across fourteen loci, and with only a total of 1169 charred remains returned (of which 362 were unidentified small and large seed fragments). The food crops identified include six-row hulled barley (*Hordeum hexastichum*), wheat (*Triticum sp.*), and barley (*Hordeum vulgare sensu lato.*) (N=43), four lentils (*Lens culinaris*), one piece of sorghum (*Sorghum bicolor*), and six fragments of date stone (*Phoenix dactylifera*). One cotton seed (*Gossypium sp.*) has been recovered. Potentially, the seeds of alfalfa (*Trifoliae: cf. Medicago sativa*) have been identified (N=5). Some loci have returned evidence for food preparations in the form of charred food residue (N=68), which require further analysis.

The apparent reliance on a winter crop assemblage including wheat and barley at Jebel Barkal is in line with regional patterns, including Napatan Kawa (Fuller and Lucas, 2021). However, due to the statistically insignificant size of the analysed material so far, this observation needs to be quantified by incorporating the results of the analysis of the material from the 2022 and 2023 seasons. We hope to answer the questions raised by this preliminary data through more extensive sampling.

## References:

Fuller, D. & Lucas, L. (2021) 'Savanna on the Nile: Long-term agricultural diversification and intensification in Nubia', in *Savanna on the Nile: Long-term agricultural diversification and intensification in Nubia*. Oxford University Press, USA.

**Keywords:** Jebel Barkal, Napatan, Meroitic, subsistence strategies, resilience

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<sup>a</sup>Speaker



# Revisiting the Mound of the Pharaohs: New Analysis at Buto, Egypt

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Investigating the early days of the ancient Egyptian state is a well-established research area in which archaeobotanical evidence has played a vital role. One key site that has revealed much material of this period is the settlement at Buto, in Lower Egypt. Previous archaeobotanical research of the macro-botanical remains from Buto (Thanheiser 1997) has revealed information about plant husbandry practices and the environment, but left several questions open for future investigations. This paper builds on earlier analysis, but looking at a wider temporal and geographic range. The paper will focus on the changes in the archaeobotanical assemblage over a period of Egyptian history.

Thanheiser, U. (1991). Untersuchungen zur Landwirtschaft der vor- und frühgeschichtlichen Zeit in Tell el-Fara'in in Buto. *Ägypten Und Levante*, II, 39–45.

Thanheiser, U. (1997). Die Pflanzenfunde. In T. von der Way, *Tell el-Fara'in. Buto I. Ergebnisse zum frühen Kontext Kampagnen der Jahre 1983-1989.*, Mainz am Rhein: Philipp von Zabern, pp. 238–252.

**Keywords:** Macroremains, Egypt, Delta

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<sup>a</sup>Speaker

# Autofluorescent phytoliths. A new proxy for detecting fire signal in tropical and subtropical regions.

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Tracking evidence of past fires is crucial in the understanding of human practices and landscapes evolution. Representing a global agro-pastoral tool, especially in the tropic, it has major relevance for both archaeobotany and palaeobotany. In such anthromes, phytoliths yielded generally good preservations and provided local signals. However, the different approaches to identifying burn phytolith turned out rarely adequate apart from their development contexts (Evet & Cuthrell, 2017).

The recent study on autofluorescent phytoliths (Devos et al., 2021) opens new perspectives. However, so far, the exploration of fluorescent archaeological phytoliths is limited to the European temperate regions. Present contribution intends to further explore the potential of this technique to reconstruct fire histories for the African continent, and more largely for tropical and subtropical regions. Therefore, we explored different modern and ancient contexts.

This comparative process permits an evaluation of the relevance of autofluorescence phytoliths as a new proxy for detecting fire in archaeological and palaeoenvironmental deposits.

Devos, Y., Hodson, M. J., & Vrydaghs, L. (2021). Auto-fluorescent phytoliths: a new method for detecting heating and fire. *Environmental Archaeology*, 26(4), 388-405.

Evet, R. R., & Cuthrell, R. Q. (2017). Testing phytolith analysis approaches to estimate the prehistoric anthropogenic burning regime on the central California coast. *Quaternary International*, 434, 78-90.

**Keywords:** Phytoliths, fire, fluorescent

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<sup>a</sup>Speaker

# The exploitation of plant food types in the Jos Plateau, central Nigeria

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Recent archaeological excavations of a rock shelter on Fier hill complex, in the Jos Plateau, central Nigeria revealed three main occupation phases namely (i) the early Later Stone Age (LSA) that was characterised by lithic tool assemblages, (ii) material culture reflective of the Iron Age (IA), and (iii) the historic age. The archaeobotanical data revealed that first, an exploitation of a diversity of plant food resources characterised the archaeological phases; second, in each phase, some plant types were emphasized over others, which was an indication of specialized food production strategies among the people, and third, the richness of the archaeobotanical data indicated that the society was generally food secured despite the historic climatic and ecological changes associated with the region.

**Keywords:** Archaeobotanical remains, *Pennisetum glaucum*, food security, Later Stone Age, Jos Plateau, Nigeria

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<sup>a</sup>Speaker

# Shaqadud Archaeology Project – Reconstruction of environmental changes and food resources availability. Introduction to methods

Adela Pokorna <sup>a b 1</sup>, Kristýna Hošková <sup>a c 2</sup>, Jan Hošek <sup>3</sup>, Lucie Juříčková <sup>4</sup>, Ikram Madani Ahmed <sup>5</sup>, Jiří Unger <sup>1</sup>, Lenka Varadzinová <sup>6</sup>, Ladislav Varadzin <sup>1</sup>

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Our aim is to detect changes of resources availability in the NW Butana, Sudan, during the African Humid Period (AHP). However, it is still difficult to understand human-environment interactions in Sahelian hinterlands during the AHP, mainly due to generally poor preservation of plant remains in the area (in contrast to hyper-arid conditions to the north, and humid conditions to the south) and due to destruction of the sediments by aeolian erosion. Shaqadud area represents, in this context, a unique prehistoric site with deep, well-preserved, and stratified profiles dating back to the beginning of the Holocene.

Prehistoric cultural deposits found in the Shaqadud site during 2021-2023 field campaigns contain, among artifacts, faunal remains (bones), diversity of terrestrial and aquatic snail shells, fragments of charred wood and seeds, as well as abundant and well preserved phytoliths. These finds represent diverse proxies for the reconstruction of ecosystem's development. Moreover, relics of fossil freshwater springs constitute a proxy for reconstruction of humidity and temperature changes. Detailed serial stable isotope analyses, micromorphology and AMS radiocarbon dating of tufa and travertine deposits from these springs provide crucial data for hydroclimatic reconstruction and for in-depth examination of the onset and history of the AHP in the Eastern Sahel.

Besides, detailed study of geomorphology, along with botanical and ethnobotanical surveys help to reveal various habitat-types according to their current vegetation composition and diversity. We particularly focused on a specific vegetation-geomorphological phenomenon known locally as el-shataib. The shataibs (steep small canyons draining seasonally rainfall water from the mountain plateaus into lower plains) are associated with the richest vegetation cover and the highest species diversity. These features were selected as particularly important because most of the archaeological sites investigated in the area were associated with them.

**Keywords:** African Humid Period, Food resources availability, Holocene environmental changes, Methods, Multidisciplinary research, Phytolith analysis, Reconstruction of humidity and temperature

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# Food for thought: Archaeobotanical evidence of plant subsistence in Late Antique Marea, Egypt (preliminary results)

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## FOOD FOR THOUGHT: ARCHAEOBOTANICAL EVIDENCE OF PLANT SUBSISTENCE IN LATE ANTIQUE MAREA, EGYPT (PRELIMINARY RESULTS)

Tzvetana Popova, Hanna Hristova

The site of Marea and its Late Antique agglomeration are located on the south shore of Lake Maryut (ancient Mareotis), about 45 km to the southwest of Alexandria, Egypt (see Babraj, K. Szymańska, H., et al., 2013). The Late Antique settlement, with remains of a harbor and industrial facilities, dated to the 5th–6th century. The archaeobotanical samples were collected during the excavation season in 2016 and represent plant material dated to the Umayyad period. They were collected from several rooms, located in House n°1. Archaeobotanical analysis revealed the use of a wide spectrum of domesticated and other useful plants including cereal crops, leguminous crops, fruits, oil plants and grasses. Remains of the following cereal crops were identified: einkorn wheat (*Triticum monococcum* L.), tetraploid free-threshing wheat (*Triticum aestivum/durum* L.), hulled barley (*Hordeum vulgare* var. *vulgare*), rye (*Secale cereale* L.), oat (*Avena* sp.), and millet (*Panicum miliaceum*). The presence of hazelnut, almond and peach stones, as well as grapevine seeds, indicates that these species were probably grown or were traded. Oil plants, such as sesame, appear to have been utilized as well, probably for oil production, although no reliable archaeobotanical evidence has been found at the site. The presence of *Leptadenia pyrotechnica*, *Acacia nilotica*, *Desmostachya bipinnata*, *Imperata cylindrica* shows the relationship between the surrounding palaeoenvironment and people who intentionally collected different wild-growing plants for various purposes.

**Keywords:** Marea, Egypt, crops, wild grasses, plant foods, subsistence

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# An ancient Egyptian gardener's secret: four unidentified florae raised in early New Kingdom Theban formal gardens

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In early New Kingdom in Egypt (1550-1351 BCE), the early to mid-late 18th Dynasty pharaohs who ruled from Thebes (present-day Luxor) built various types of formal gardens(1) in and around their capital and its localities prior to the reign of the dissenter Amenhotep IV/Akhenaten (1351-1334 BCE). These formal gardens were constructed in proximity to the palaces, temples, shrines, or cenotaphs of the king, royalty, and/or gods, as well as beside upper-class homes and tombs. These formal gardens were aesthetic landscapes used for various sports, festivities, rites, and forms of leisure and entertainment, as well as functioned as seasonal, surplus produce for the institutions to which they were connected. More than 42 native and foreign floral and 11 faunal species were incorporated by architects into the landscape designs of these formal gardens. The flora and fauna in the formal gardens were raised and supervised by intricate networks of individuals (Reichart 2022; Reichart 2021; Reichart forthcoming). Four of the 42 floral species have yet to be identified with a family and/or species with certainty by scholars: the *mnw*-plant, the *mnwH*-plant, the *tjwn*-plant, and the *iHy*-plant in hieroglyphs. An examination of evidence across a variety of disciplines(2) aims to identify the four florae with a family and/or species from our modern plant taxonomy, and to further situate them into the interconnected milieu of pharaonic Egypt and its neighbors in North Africa, the Eastern Mediterranean, and Near East from the 3rd to 1st millennium BCE.

(1) Such types in hieroglyphs include the *š*-, the *xnty-š*-, the *sš*-, the *k3mw*-, the *'at-nt-xt*-, and the *Hrrt-š*-formal gardens.

(2) Such as but not limited to Egyptology, Near Eastern and Classical Studies, archaeology, linguistics, sociocultural anthropology, archaeobotany, phytochemistry, medical chemistry, and pharmacology.

**Keywords:** Egyptology, archaeobotany, ethnobotany, economic botany, ancient Egyptian gardens, formal gardens, garden history, sociocultural anthropology, history of gardening, horticulture

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<sup>a</sup>Speaker

# Archaeobotany of Great Zimbabwe

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The archaeobotanical record from Zimbabwe includes charred remains from Early Holocene through to Iron Age sites, often recovered from sieved samples or the flotation of small sample subsets (Jonsson, 1998). More focused efforts to recover archaeobotanical macrofossils at Iron Age sites have been conducted at Great Zimbabwe (Jonsson, 1998; Chikumbirike, et al. 2016) and Mtanya (Mushangwe, 2019). However, systematic flotation of samples has largely been absent, and we lack detailed information about the plants present throughout the occupation of sites.

As part of the project, ‘*Archaeometry and social formation in southern Africa*’, led by Professor Shadreck Chirikure, we are undertaking excavations at the iconic World Heritage site of Great Zimbabwe. We will systematically sample contexts for macrobotanical remains using flotation methods and analyse microbotanical remains from soil samples. We will also collect modern flora and seed samples from locally grown plants for morphometric and isotopic comparison with archaeobotanical materials. As there has been relatively little archaeobotanical data published from Great Zimbabwe or other contemporary archaeological sites, our first objective is to build a clear understanding of the plant species present during the occupation of the site. We will then ask broader questions about the social and environmental context of plant use at the site and link with the archaeozoological and material records also being investigated as part of the project.

In this poster, we will summarise the existing archaeobotanical data from across Zimbabwean archaeological sites before discussing our archaeobotanical plans for excavation at Great Zimbabwe. We welcome any input or information about existing archaeobotanical data from Great Zimbabwe or other Iron Age sites in Zimbabwe.

## References:

- Chikumbirike, J., Bamford, M. K., Esterhuysen, A. B. (2016). A Study of Archaeological Charcoal from Great Zimbabwe. *The South African Bulletin*, 71(204), pp107-118.
- Jonsson, J. (1998) *Early Plant Economy in Zimbabwe*. Studies in African Archaeology 16. Department of Archaeology and Ancient History, University of Uppsala, Uppsala, Sweden.
- Mushangwe, C. T. (2019) *Human-Plant Interactions in Semi-Arid Regions: An Archaeobotanical Study of the Iron Age Site of Mtanya, Southwestern Zimbabwe* (unpublished master’s thesis). University of Cape Town, Cape Town, South Africa.

**Keywords:** Great Zimbabwe, Macrobotanical remains, Social formation

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# IWAA

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