

An ethnoarchaeological study of finger millet in Uganda

Melissa Shiress, Institute of Archaeology, University College London

To date, archaeobotanical research on finger millet in Africa is limited. Its place of domestication remains uncertain and there has not as yet been a concerted effort to understand its role as a food crop in the African past. Problems of preservation and retrieval of macrobotanical remains have meant that there is a paucity of evidence for the role of finger millet cultivation in past African societies. However, the site of Ntuusi in southwestern Uganda has yielded significant evidence for the cultivation of finger millet, suggesting that this was already a crop of some significance by the first half of the second millennium CE.

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During the summer of 2017 I undertook ethnographic research in the southwest and east of Uganda to better understand the different stages of the cultivation and processing of finger millet, and its preparation as a foodstuff and as beer. Through ethnographic examination of these processes I hope to generate greater insights for the interpretation of archaeological data, in order to explore the role of finger millet to the societies that produced it and to understand the processes by which finger millet remains enter archaeological assemblages.



- Finger millet (*Eleusine coracana*) is often intercropped with other food plants, such as sorghum, cassava and maize
- It is largely grown in hilly areas
- In Ntuusi, there are 2 growing seasons, per year, but few people grow it twice in a year. In Kanungu, it is grown once within a given year
- In Kanungu, where people had previously left land fallow for around ten years after harvesting finger millet, an increased population and decrease of uncultivated land has meant that land is now left fallow for a shorter period of time, around 3-5 years

Cultivation and harvesting



- Iron knives are used for harvesting. Baskets are now less commonly used than plastic basins. In Kanungu, the decrease in use of baskets coincided with increasing deforestation; the necessary materials for basketry became less easily accessible
- The harvested fingers are then sundried. At this stage they can be stored to be processed at a later date
- One interviewee in Kanungu described how, in the mid-twentieth century, households were entitled to keep a certain portion of their finger millet harvest but the rest was stored communally at the local government headquarters, as a precaution against times of famine



- The first stage after sundrying is threshing the finger millet to remove the seeds from the stalks
- After threshing, the millet is then winnowed using trays. It is then picked over by hand to remove any remaining chaff
- The waste from this process is used variously for chicken feed, as sawdust, or put on banana plantations
- As a free-threshing cereal, finger millet is dried in the sun rather than with fire. This could therefore reflect on the paucity of macrobotanical remains

Processing and storage



- The finger millet is stored either before or after threshing and winnowing, and in its unthreshed state can keep for up to ten years. Finger millet that is half-germinated or ground is prone to weevils
- Granaries are used to store finger millet and other grains such as sorghum. Such granaries are made from reeds with a thatched grass roof. The exterior is covered with cow dung to protect the structure, which is supported on wooden posts, from termite damage
- Granaries are diminishing in number in Kanungu as finger millet cultivation has become less prevalent



- Grinding stones are used for smaller quantities of finger millet. Larger quantities (such as those needed for beer production) are taken to communal grinding machines
- In Kanungu, the cultivation and processing of finger millet is done by women, and it is women who own the grinding stones
- When it is ground into flour it can be used to make finger millet bread, porridge (hot or cold), or beer. Finger millet bread is seen as a traditional food, and one that is served to parents-in-law
- In the past, newly-wed women would be given gifts of finger millet by their sisters and female friends when they moved to a new household. This was to sustain her new household until she began cultivating her own finger millet. However this tradition has become increasing less common in recent years

Grinding and food preparation

- Finger millet flour is often mixed with flour made from dried cassava and used to make millet bread. In Kanungu, this is a relatively recent innovation, and was adopted as finger millet became cultivated in decreasing amounts
- Plain finger millet flour is used to make porridge
- Hot porridge is made from a mixture of half-germinated finger millet and flour
- Finger millet (after having been threshed and winnowed) is left in a basin of water for a day, and then this mixture is poured into a banana leaf-lined pit where it is kept for around three days, until the water has drained out
- At this stage it will begin to germinate, and is removed to be sundried. In this state the finger millet can be stored for around a month
- This is then ground to make flour, and mixed with already made hot porridge. The addition of the germinated finger millet adds sweetness and sharpness.



- Beer production is done, almost exclusively, by women. Its production entails both expertise and an investment of time and labour
- I interviewed several women who were producing finger millet beer in Tororo, in the east of Uganda. Most of these women were not growing their own finger millet; they were buying it from farmers in order to make beer. This beer was largely being for commercial purposes. In some instances, clients were buying this beer to distill into another form of alcoholic beverage
- To make beer, finger millet flour is mixed with water and placed in pits to ferment for about a week. Some of this beer was made from a mixture of both cassava and finger millet. One interviewee stated that she only made beer solely from finger millet for special occasions such as funeral rites, or for esteemed visitors
- While the fermentation is in progress, additional finger millet is malted. It is kept moist and covered for several days to allow the millet to germinate. In order to then halt this process, the partially germinated millet is dried, roasted, and then milled before being combined with the fermented mixture.

Beer production and consumption

- As described in Karp's ethnographic study of beer consumption among the Iteso of eastern Uganda (1987), vessels fabricated from organic materials were used for the consumption of maize and banana beer; however, ceramic vessels were used for beer made from finger millet. This speaks to finger millet's status as a special foodstuff, and suggests that beer consumption, as well as production, could be visible in the archaeological record
- Whereas vessels made from plastic are utilised in present-day beer brewing, we could expect to find residues of lactic acid and / or grain fragments on the interior of ceramic vessels used for brewing in archaeological contexts
- One interviewee in Kanungu described how she had used the same pits repeatedly for beer production since at least 1975. This long-term reuse of beer brewing pits could also leave an archaeological signature



Table showing planting and harvesting seasons in both Ntuusi and Kanungu

	January	February	March	April	May	June	July	August	September	October	November	December
Ntuusi	harvesting season 2	field preparation and sowing, season 1		weeding season 1			harvesting season 1	field preparation and sowing, season 2		weeding season 2		harvesting, season 2
Kanungu						field preparation	field preparation	sowing	sowing (until middle of month)		weeding	harvesting