Archaeobotany Work Group meeting: Amorphous cereal type products, MOLA, London

Saturday 07/03/2020

Minutes by Ruth Pelling and Anne de Vareilles

The spring 2020 AWG meeting was kindly hosted by Dr Lara González Carretero at MOLA, London and was very well attended (25 attendees). Amorphous charred fragments of seemingly organic material are commonly encountered in archaeobotanical flots and residues. It is often assumed that at least some of these fragments might consist of cereal based food debris, but few archaeobotanists have attempted to identify them unless cereal remains have been easily visible, such as in the case of the 'Yarnton bread' identified by Mark Robinson (Hey et al 2017). The recognition of potential food debris by low powered microscopy is a significant first step in greater identification and recording of the likely vast range of past cooking techniques and cuisine, and identifiable fragments are likely to be far more widely present in the archaeological record than previously acknowledged.

Lara presented the methodology which she has developed during her PhD and subsequent research on food remains, using both experimental methods and archaeological remains. The experimental work formed a vital and substantial part of Lara's work and included grinding, preparing, cooking and building ovens. The criteria used to characterise charred food debris (inclusions, air bubble density and number, void types) were discussed with clear illustrations as were the matrix types that can be recognised in archaeological material (Matrix types 1 – 4: flat (unleavened) breads, possible fermented/leavened bread, dough and 'porridge type'). While the full methodology requires both a binocular microscope and an SEM., Lara presented examples of material that could be described using the low powered microscope alone.

Since developing her criteria while examining Neolithic food remains mostly from Çatalhöyük, Anatolia, Lara has been recognising cereal based food remains in assemblages from across the Old World, including a large number from the A14 projects in Cambridgeshire in the UK. Of the staggering 9176 samples assessed from the scheme, 277 have contained cereal based foods. To data Lara has analysed and identified more than 250 fragments ranging in date from the Iron Age (600 BC) to the medieval period (1400 AD). A high profile development was Lara's identification of likely Iron Age wheat based brewing remains, distinguishable from porridge type material by the morphology of the grain fragments (rounded/worn/broken down rather than cleanly cracked) and the gelatinisation of the starch granules which implied a soaking stage. Examples of Saxon porridge conversely produced grain fragments with sharp edges consistent with being ground (cracked) in a rotary quern. Iron Age bread like product was also identified.

The remainder of Lara's presentation focused on what archaeobotanists can and should record using a binocular microscope, acknowledging that many do not have ready access to an SEM. The following details can be recorded:

1. Differentiation of food fragments from charcoal, tubers, dung, nut-meat etc.

2. Roughly characterise according to presence of particles and porosity.

3. Look for visible shiny areas and inclusions such as fragments of grains and bran

4. We can at least differentiate between bread-like and porridge-like materials (examples given)

5. Describe their appearance and microstructure

6. Cost for SEM analysis in your recommendations.

Some useful questions were raised during the discussion that followed, and then examples of material were shown. Useful points to arise during the discussion:

- It is unlikely to be worth routinely examining food type fragments smaller than 4mm.
- Food type deposits are more commonly found in residues that flots as they tend to float poorly – it may be worth screening flotation samples by laying a larger sieve over the flotation tank for samples from certain contexts such as ovens.
- Dung can usually be distinguished from porridge type material on the basis of greater quantities of chaff/stem/leaf, as well as internal structure

After lunch the group continued to examine fragments of Lara's experimental and archaeological material and shared fragments they had found. Ruth Pelling brought the Colchester 'biscuit', a 1st century AD charred 'galette' type object, likely to be Roman *bucellatum* (hardtack or military biscuit), and some experimental reconstructions. Other group members had amorphous fragments, some of which were likely to be bread or porridge type remains.

Many thanks to Lara and to MOLA for allowing us to use the space and for providing refreshments. Lara is leading the way in the identification of amorphous cereal type products and we are extremely grateful for her expert guidance. A pdf of her presentation is being circulated around the AWG.

References

Hey, G., Bell, C., Dennis, C. and Robinson, M. 2016 *Yarnton: Neolithic and Bronze Age Settlement and Landscape*, Thames Valley Landscapes Monograph Volume **39**, Oxford: Oxford Archaeology

González Carretero, L., Woolstonecroft, M. and Fuller, D.Q. 2017 'A methodological approach to the study of archaeological cereal meals: a case study at Çatalhöyük East (Turkey)' *Vegetation History and Archaeobotany* **26,** 415-432

Questions raised during discussion

Q. How can we distinguish porridge type deposits from dung? (Gill Campbell)
A. Texture ('porridge' type deposits typically have cracks/morphology due to boiling) and chaff/leave content

Q. Can we distinguish between grain (eg charred endosperm) and tiny fragments of bread type structure? (Alexandra Kritti)
A. Should have a size criteria – anything from the <4mm mesh size is likely too small to be economically worth examining.

Q. Can we do anything with completely vitrified material (Anne de Vareilles) or separate out food debris from general rubbish (AK)
A. If too heavily vitrified it would not be possible to recognise structure, generally structure and inclusions will be enough.

Q. How to distinguish between bread and dough given bread has a crust (Rachel Fosberry) – also 'biscuits'
A. Bread and dough have different microstructure due to wetness of dough.

Q. Is it worth investigating lumps that appear to consist of a mass of burnt grain? (Meriel McClatchie)
A. Yes, it is always worth investigating as it could still be a food type, such as 'porridge' type.

Q. Do the charred food type fragments tend to be in the flot or heavy residues? (Stacey Adams)
A. Often in the residues as they don't float well – worth training technicians to recognise it.
RP – we should add it to Fay Worley's commonly occurring residue finds image database.
GC – perhaps worth experimenting with mesh over flotation tank to capture before they go in the water, especially for certain contexts such as ovens.

Q. How were the cereals within the Palaeolithic bread samples identified as wild cereal types (A de Vareilles)
A. Aleorone cells and bran cells differ between wild wheat and barley and cultivated.

Q. How much can be identified using the charcoal microscope? (Gill Campbell)
A. Quite a lot – should be able to recognise the inclusions and distinguish barley/non-barley.

Matters arising

RP to arrange CIFA CPD certificates for next meeting. Think about week day vs weekend meeting.

Add amorphous food type residues to commonly occurring residue finds HE image database.

RP to circulate Lara's presentation

Possible workshop or subjects:

Isotopes in archaeobotany molluscs for archaeobotanists

archaeobotanical illustrations