The CUISINE project
An innovative approach for the study of culinary practices in past societies

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Project rationale

The CUISINE project aims at developing an innovative methodology for the study of culinary practices (cuisine) in past societies through the **integrated analysis of phytoliths, starch grains and lipids from cooking pottery**. In order to interpret the archaeological record, **extensive plant reference collections and several experiments will be developed as part of the project**. At the same time, the methods developed during the experimentation phase will be tested and validated on two archaeological case studies. The development of these integrated analyses on Neolithic and Bronze Age settlements will allow for the study of the emergence of new social practices and cultural identities linked to the origins of food production and the development of urban societies. Moreover, this project will **bring plants into the picture on the basis of full-spectrum residue analyses from archaeological pottery**. Plants and animals are often cooked (and consumed) together (e.g. the combination of dairy and cereals to prepare dishes such as *trahanas*, the use of spices to flavour up a stew, etc.). Thus, the combination of techniques/approaches proposed in this project will **eliminate the methodological bias that has overemphasised the role of meat products and byproducts on prehistoric cuisine**.

Methodology

Reference collections:

- Design based on **literature data and field surveys of traditional culinary practices** in the study areas (northern Greece and Crete).
- Modern plants collected to identify **diagnostic microbotanical remains** as well as their **lipid content**, paying special attention to plants commonly used for cooking but often overlooked in archaeobotanical research, such as wild greens.

Experimentation:

- **Cooking experiments** with replica vessels to study: a) the **preservation** of microbotanical remains when cooked with different vessels and cooking conditions (technique, temperature, time, etc.), and b) the **spatial distribution** of microbotanical remains in pottery vessels.
- **Laboratory experiments** with subsamples of the replica vessels to develop a method to recover lipids and microbotanical remains from a single sample and in a single procedure. The experiments will be specifically directed towards **recovering microbotanical remains from the powder resulting from the pottery drilling method used to extract lipids**.

Archaeological contexts:

- **Neolithic Stavroupoli** (Greek Macedonia, ca. 5600-5000 cal. BC): charred food crust.
- **Bronze Age Knossos-Gypsades** (Minoan Crete, ca. 3650-1100 cal. BC): potsherds sampled prior to washing to recover the sediment attached to their inner surface.

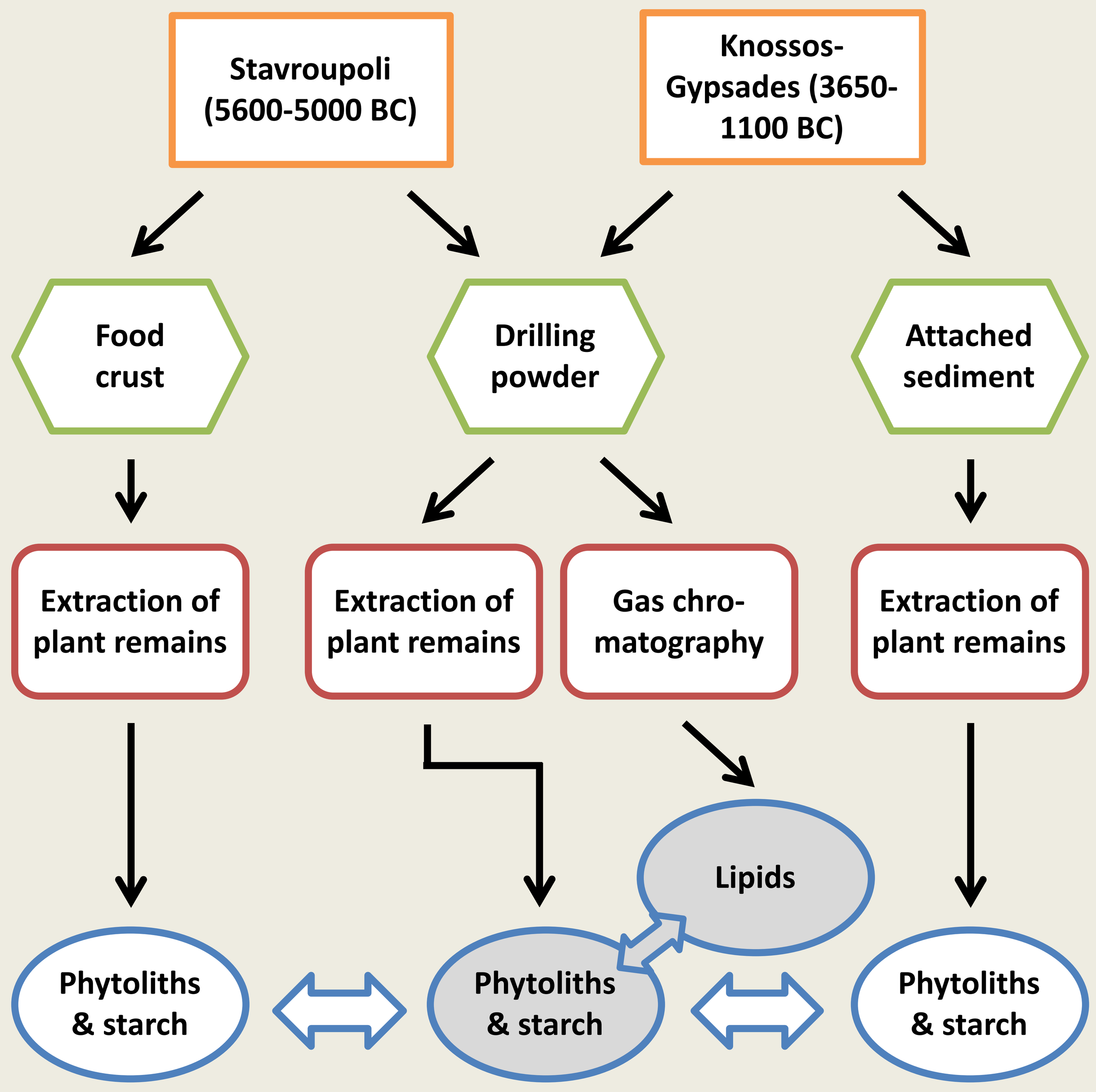

Figure 1. The microbotanical remains recovered using traditional methods (sampling of food crust/attached sediment) will be compared with the remains recovered using the new experimentally developed method (drilling powder), thus independently assessing the validity of the new method against two standard procedures.

First results: cooking plant foods at Neolithic Stavroupoli

Starch and phytolith analyses from charred food crust adhering to the inner wall of 17 early Late Neolithic vessels (García-Granero et al. submitted):

- **Domestic wheat** (einkorn and, possibly, emmer) and **lentils**, as well as **weedy *Setaria* sp. and wild geophytes** (Figures 2 and 3).
- *Setaria* weeds –> **high soil fertility and disturbed growing conditions** (Jones et al. 1999).
- Wheat and lentils + *Setaria* weeds –> in Neolithic southeastern Europe: a) cereals and pulses were cultivated in intensively manured plots (Bogaard et al. 2013) and b) subsistence strategies relied on highly integrated small-scale agropastoral systems (Bogaard 2004; Halstead 1996).

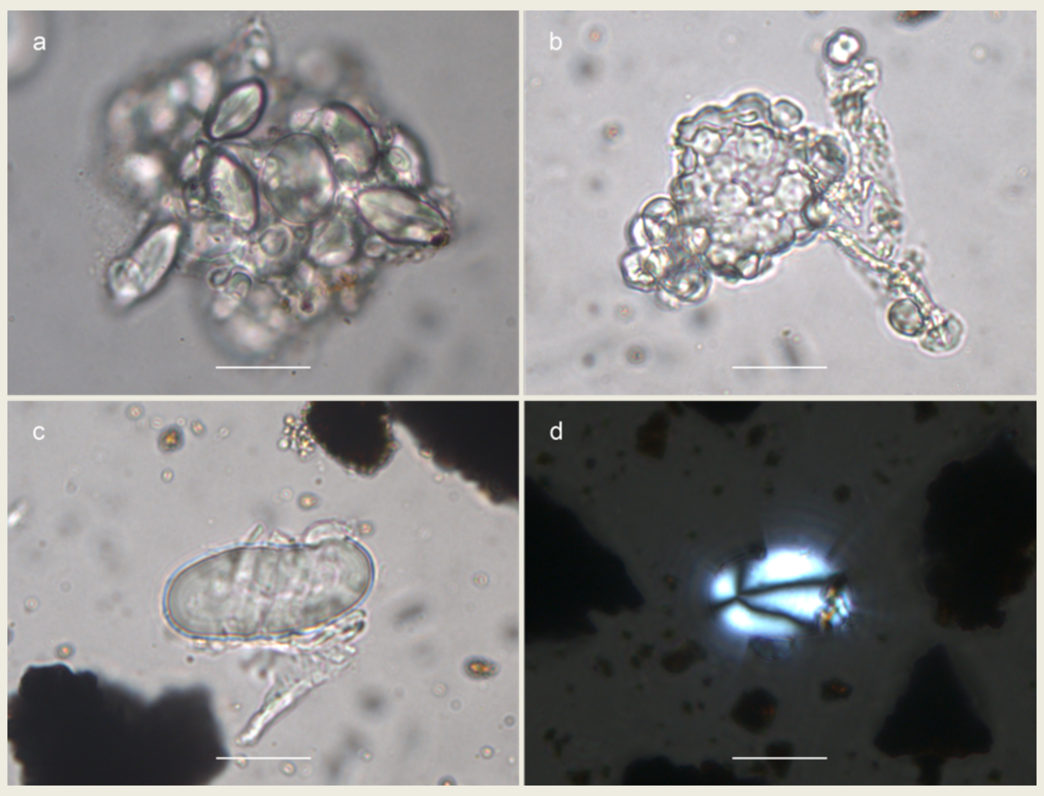

Figure 2. a) Aggregation of >71 cf. *Triticum* sp. starch grains; b) aggregation of >30 cf. *Setaria* sp. starch grains with evidence of having been boiled; c) cf. *Lens* sp. starch grain with evidence of having been boiled; d) geophyte starch grain under cross-polarised light. Scale bars 20 µm.

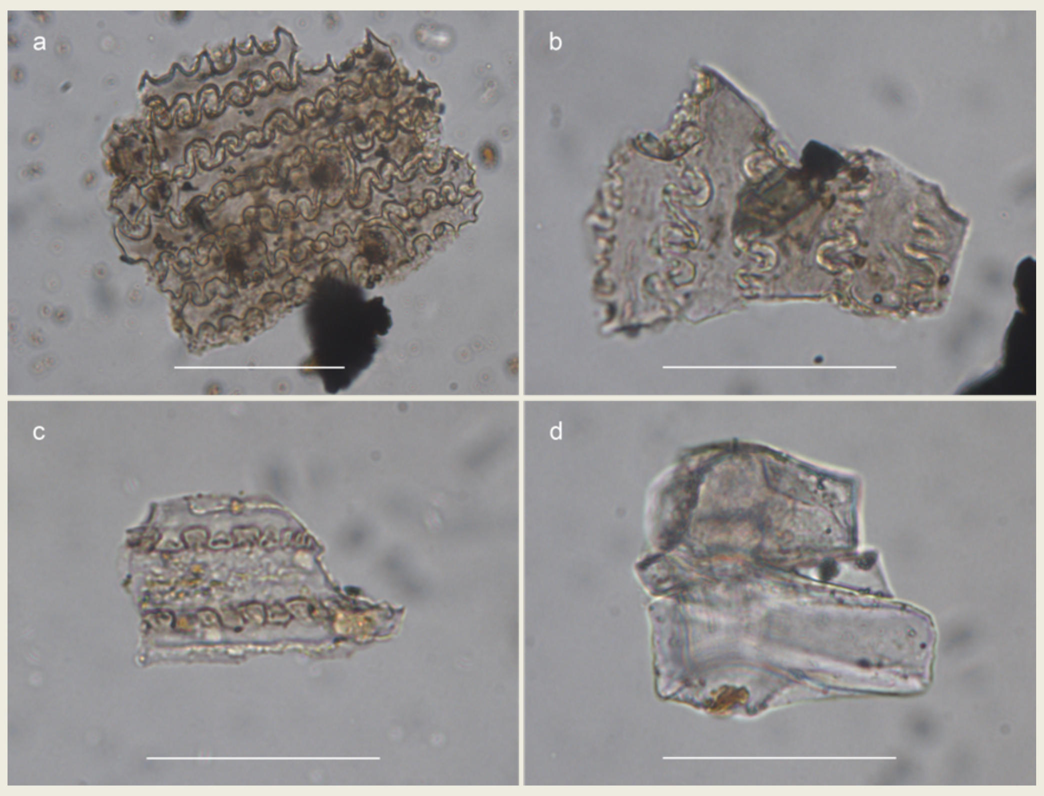

Figure 3. a) *Triticum monococcum*-type (einkorn) husk silica skeleton, note the dark coloration probably due to cooking ; b) *Triticum* sp. husk silica skeleton; c) grass silica skeleton with crenate long cells, probably from a panicoid husk; d) bulliform silica skeleton from a grass leaf. Scale bars 50 µm.

- **Differential access to food resources in different households** (more vs. less valued food), also evidenced for dairy products by lipid analyses (Urem-Kotsou 2011):
  - different types of meals prepared in separated areas of the settlement—i.e. daily vs. special commensal occasion (Halstead 2015); or
  - different preferences or economic status of its inhabitants expressed through culinary practices (see e.g. Goody 1982).
- **Future research** at Stavroupoli will specifically target this issue through **integrated microbotanical and lipid analyses from cooking vessels** from different areas of the settlement.

Bogaard A (2004) *World Archaeol* 37: 177–196; Bogaard A et al. (2013) *PNAS* 110: 12589–12594; Curet LA, Pestle WJ (2010) *J Anthropol Archaeol* 29: 413–431; García-Granero JJ et al. (submitted) *Quat Int*; Goody J (1982) *Cooking, Cuisine, and Class: A Study in Comparative Sociology*; Halstead P (1996) *World Archaeol* 28: 20–42; Halstead P (2015) Feast, food and fodder in Neolithic-Bronze Age Greece: commensality and the construction of value, in Pollock S (ed) *Between Feasts and Daily Meals*: 29–61; Jones G et al. (1999) *Ann Brit School Athens* 94: 167–189; Urem-Kotsou D (2011) Recent approaches in ceramic research: vessel use and food residue analysis in Late Neolithic pottery from northern Greece, in *Panonski Prapovijesni Osviti: Zbornik Radova Posvećen Korneliji Minichreiter*: 247–266.