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POT-FLOW a field-to-lab protocol to optimize the integrated analysis of pottery vessels contents

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We use this protocol and it's working

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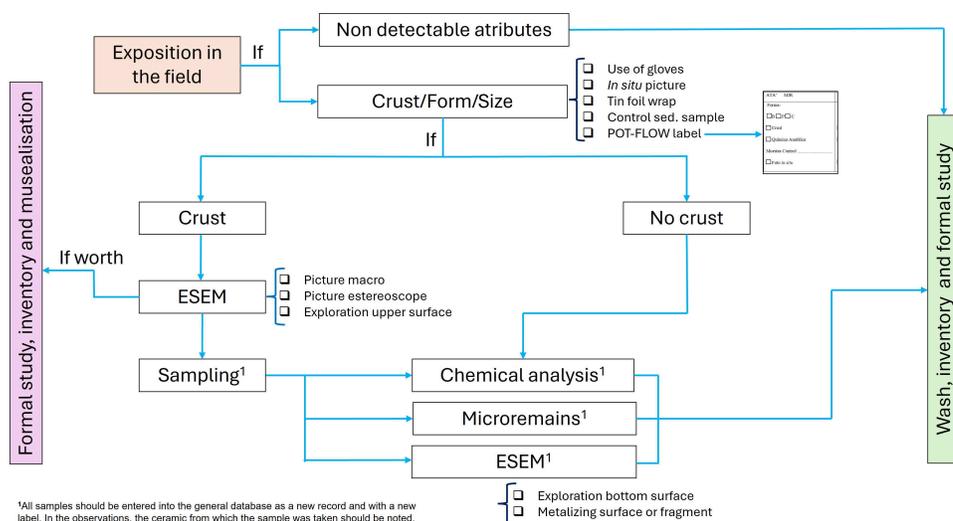
Abstract

This contribution presents a sampling and decision-making protocol (Pot-Flow) designed to optimise the study of ceramic sherds that may have contained organic products such as drinks or foods. The protocol is based on the principle of minimising unnecessary manipulation while enabling the application of a maximum number of analytical techniques on the same fragment. It proposes a logical workflow that considers both specific procedures and the requirements of each analytical method, and structures around observable attributes and conditional steps.

The primary aim of this early selection of candidate sherds directly in the field is to preserve as much information as possible from each by ensuring the physical integrity of fragile remains—such as foodcrusts and micro-remains—and avoiding contamination that could compromise chemical analyses. The protocol was tested during the 2025 season at the El Mirador site (Atapuerca, Spain), which allowed us to implement modifications and improvements reflected in this final version.

Overall, Pot-Flow serves as a framework for a series of further analytical steps, with specific protocols developed for ceramic vessel analysis and can be adapted to the particular conditions of each field intervention and to any chronological period.

POT-WORKFLOW:



PROTOCOL FLOW-CHART

Attachments



[POT-FLOW labels.docx](#)

359KB

Guidelines

When selecting ceramics for potential analysis, if there is any doubt during fieldwork, it is best to collect them following the protocol and discard them later if necessary.

Materials

Gloves
Spoon/ tool for scooping
Distilled water, alcohol or acetone to clean the spoon
Tin foil
Bags
Labels
Pencil

Troubleshooting

Safety warnings

-  This protocol systematizes only how to take the samples and the chain of custody from field to museum. For food crust study and for analytical chemistry analysis follow the specific protocols of each discipline.

Protocols should be adapted to each particular site. In the case of this one, please discuss it with your team, specially with colleagues carrying out the field work, archaeobotanists and chemists. Make sure all team members know how to follow the necessary steps of the protocol.

FIELD

1 **EXPOSITION OF A POTTERY SHERD OR VESSEL** during excavation



Fig. 1. Pot-sherds uncovered in situ during excavation (Picture J.M Vergès-IPHES-CERCA)

2 **FIELD SAMPLING** Sample

Note

IF non detectable crust and specific features (such as rim, base, particular clay of size) jump to step 5

2.1 **Take *in situ* pictures/ document**



2.2 **Wrap the sherd in tin foil**, always use gloves and clean equipment and manipulate as indicated by the person in charge of chemical analysis

- 2.3 **Take sediment control sample** (underneath the ceramic, preferably of the sediment in contact with the internal part of the vessel and), always use globes and clean equipment and manipulate as indicated by the person in charge of chemical analysis and handle to the specialist
- 2.4 Use the *Pot-Flow* or similar label to **identify** your sherd and control sample
- 2.5 Add information to the database

LABORATORY

3 SHERDS WITH VISIBLE **FOODCRUST**



Note

Foodcrust analysis is carried out by specialists following dedicated protocols, such as Arranz et al. under revision or Heiss et al. in preparation

- 3.1 Macro-picture of the full object
- 3.2 Stereomicroscope picture and grid drawing over regions with crust
- 3.3 **ESEM/ HIROX** scanning and decision on sputtering/ not sputtering

Note

IF sputtering go first to STEP 4

4 SAMPLING FOR **ORGANIC RESIDUE ANALYSIS** Sample

Note

When sampling for chemical analysis always follow standardized protocols such as Vallejo et al. 2023



Fig. 2. Sampling of a pot sherd from El Mirador for analytical chemistry analysis.

POTTERY STUDY

5 **WASH/ CLEAN** as planned for the site

Note

After all analysis are performed, **IF** the sherd with crust is deemed suitable for musealization go directly to step 7

6 **INVENTORY** according with the site standards

7 **FORMAL STUDY** by the person in charge



Protocol references

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