ACORNS GATHERERS: FRUITS STORAGE AND PROCESSING IN THE SOUTHEASTERN ITALY DURING THE BRONZE AGE

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INTRODUCTION

The analysis of archeobotanical assemblages recovered in recent and previous archeological excavations carried out on several sites located in southeastern Italy (Apeai, Torre Guaceto – BR; Riaci Vecchio, Melendugno – LE; Piazza Palmieri, Monopoli – Br; Scala di Piuma-Le), have revealed the importance of acorns gathering and utilize among the Bronze Age societies (Fiorentino 1995).

A number of documentary sources (ancient literature, ethnographical observation, etc) describe the use of acorns as food, both in human and animal diet (Mason 1995; Usai 1969; Mason & Niedbalt 2009), even if their occurrence doesn't necessary means evidence of use as food, in fact different purposes also has been reported (tannins agent, medical function and so on).

On the other hand charred acorns recovered in Bronze Age sites (Fig. 1) and examined in this study were strongly related to domestic fireplaces (accumulated adjacent to griddles and mixed to other edible plants such as cereals grains and legumes), suggesting an important part in protohistoric economies.

METHODS

In order to address the role of oak fruits gathering and to investigate the ways of their processing we presents first results carried out by the use of biometric analysis and experimental procedures.

Data collected through morphometric studies of ancient acorns, aimed at identify the specific taxonomy of the coryledons, are compared with modern analogous (on the base of the areal distribution of the species and anthropological analysis from the sites considered -cf Fiorentino, 1995), while experimental protocol reproduces the main cooking methods on the base of ethnographical remarks.

FIRST RESULTS OF MORPHOMETRIC ANALYSIS

Modern acorns of Q. ilex and Q. cerris were collected mature (brown) from different area of Puglia region during the end of October (Bosco Tagliacantoni and Bosco Quarto from Gargano area, coppiced ilex tree from Taranto coastal area). After the gathering, the fruits were dried in order to reduce water content (with the consequent separation of the cupule from the coryledons).

Fresh coryledons were first measured according to parameters of Length (L), diameter (d) and L/d ratio (Fig. 2).

A second measurement has been carried out after the carbonization process under controlled conditions (at 400°C for 1 hour).

Results demonstrate that:
• single parameter ("L" or "d") changes, in the same fruit, after combustion with a variable reduction of 14-18%
• the L/d ratio, before and after combustion, is constant so that L/d parameter could be used as discriminator value.

These observations confirm that biometric approach, based on comparison with modern analogous, could be a suitable method because unaffected by the combustion process.

As a consequence L/d ratio of modern coryledons (Q. ilex and Q. cerris) has been compared with L/d ratio of archaeological coryledons.

The related scattering diagram (Fig. 3) shows that:
• the best-fit values for archaeological coryledons are included between the range of Q. ilex-TA (from coastal area) and Q. ilex-PG (from the Gargano promontory).
• data seems to be in agreement with historical sources (i.e. Plinio I Vecchio) about the use, as edible fruits, of "spiced" acorn of Q. ilex.

WORK IN PROGRESS: EXPERIMENTAL PROTOCOL

Ethnographic observations (Mason and Niedbalt 2009; Mason 1995, Usai 1965) led to define those operations which have effects on: 1) “crops products” composition; 2) archeological evidences (such as: structures, implements, etc...).

For each steps of crop processing has been emphasized specific stages in which the use of fire may contribute to transform products or food in archeobotanical materials (Fig. 4).

First comparison between models and archeobotanical remains have preliminary revealed that:
• samples from scale di Piuma, in which acorns preserved their shells, could be connected to the storage stages N° 3; in fact, acorns were located in a pit preserved by fire exposure.
• sample from Apaei is characterized by a particular concentration of acorns (without shells) close to griddles and probably refers to the preparation stage N° 4: the remains testify the results of a wrong roasting?

In order to better apply these models to interpretation of acorns assemblages in archeological contexts we are working on three different experimental protocols aim at reproduce the main cooking methods on the base of ethnographical remarks (according to the flow chart proposed) such as:

1. Boiling – "Sardinian Method"
2. Roasting
3. Pounded into flour "California Indians method"

The three protocols will be performed under controlled conditions, following each steps of the operation sequences and verifying the tangible results in term of measurable products types and anthropological/archaeobotanical evidences.

**Fig. 1 Location of archaeological sites.**

**Fig. 2 Scattered diagram L/D ratio.**

**Fig. 3 Flow chart of acorns gathering and processing.”**

**Fig. 4 Flow chart of acorns gathering and processing.”**

**Fig. 5 Flow chart of acorns gathering and processing.”**