FOOD PLANTS IN THE PHOENICIAN-PUNIC WORLD AND AT MOTYA

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Archaeobotany allows to reconstruct Phoenicians' plant use and the impact they had on the surrounding environment. A case study is represented by the site of Motya, where information was obtained concerning edible plants, cultivation, and crop processing.

Keywords: Archaeobotany; food plants; Motya; *Punica granatum*; crop processing

1. INTRODUCTION

Phoenicians, a multifaceted culture which spreads across the Mediterranean between the 2nd and the 1st millennium BC, are known to have brought with them a series of innovations, including the novel socio-economic model of a port-city and the alphabet.[1] Archaeological excavations have gathered numerous information concerning Phoenicians' materiality and daily life. Nonetheless, knowledge regarding their use of plants and impact on the environment is limited. They are believed to have favored the spread of *Olea europaea* L. (olive),[2] *Pinus pinea* L. (stone pine),[3] *Punica granatum* L. (pomegranate)[4] and *Vitis vinifera* L. (grapevine)[5] in the Mediterranean basin.

An essential tool to gather information about Phoenicians and plants is represented by archaeobotany. This discipline concerns the study of plant material recovered from archaeological contexts, exploring past human-plant relationships, and focusing on food related practices and past landscapes.[6]

Although archaeobotanical analyses have so far been successfully carried out on several Phoenician-Punic sites in different areas of the Mediterranean (e.g., Carthage,[7] Santa Giusta,[8] Tell el-Burak[9]), there are still numerous spatial and temporal gaps to be filled.

In this paper, systematic archaeobotanical data are presented for the island of Motya, found in the Marsala lagoon in Western Sicily. These comprise an important addition to the state of art of the Phoenician interaction with plants.

2. MATERIALS AND METHODS

Systematic archaeobotanical analyses were introduced at the site of Motya during the excavation campaign of 2017. Over the years they have interested different excavation areas and contexts, initially focusing on a big disposal pit (F.1112) in the residential area on

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1 López-Ruiz - Doak eds. 2019.
2 Buxó i Capdevila 1997.
3 Mutke *et al.* 2019.
4 Nigro - Spagnoli 2018.
5 Buxó i Capdevila 1997.
6 Branch 2014.
7 van Zeist - Bottema - van der Veen 2001.
8 Sabato *et al.* 2019.
9 Orendi - Deckers 2018.

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the slopes of the Acropolis (Area D) dated between the first half of the 8th to the mid-6th century BC,[10] and on a sacred *favissa* (F.7057) and a smaller pit (F.7012) adjacent to the Temple of "Cappiddazzu".[11] Data deriving from these contexts will be discussed in the present paper. Nonetheless, other contexts were also sampled during the most recent archaeological campaign and are currently under analysis.

Plant macro-remains (seeds/fruits and charcoals) were recovered using bucket flotation and studied respectively using a stereomicroscope and a Nomarski microscope. Furthermore, *Vitis vinifera* L. (grape) seeds were the subject of a morphometric study.[12] Soil samples from F.1112 were also sampled for pollen analysis, chemically treated,[13] and analyzed using a transmitted light microscope. This context, 1.35 m deep and spreading over an area of 29 m^2, was particularly suitable for this type of analysis, as it was comprised of four depositional layers, each ending with an in-situ fire, allowing to record changes that occurred in time.[14]

3. Results

The carpological study led to the identification of 96 different plant taxa, preserved mostly by charring in F.1112, and mineralization in F.7057 and F.7012. Food plants are qualitatively and quantitatively less present in the sacred pits than in the disposal pit in area D. They are represented by cereals (e.g., *Hordeum vulgare* L. – barley; *Triticum turgidum* subsp. *dicoccon* (Schrank) Thell. – emmer; *Triticum aestivum/durum* – bread wheats; fig. 1), pulses (such as *Lathyrus oleraceus* Lam. – green pea; *Vicia lens* (L.) Coss. & Germ. – lentil; *Vicia ervilia* (L.) Willd. – bitter vetch) and fruits (including *Ficus carica* L. – fig; *Olea europaea* L. – olive; *Pinus pinea* L. – stone pine; *Punica granatum* L. – pomegranate; *Vitis vinifera* L. - grapevine).

Twenty-six taxa make up the anthracological assemblage. The most frequent of these is *O. europaea*, represented by a total of 408 fragments. This is followed by other two Mediterranean taxa: evergreen oaks (*Quercus* evergreen; 240 fragments) and lentisk (*Pistacia lentiscus* L.; 201 fragments).

Finally, 46 taxa were identified following palynological analysis. These are represented mostly by herbaceous plants (i.e., Asteraceae Asteroideae, Poaceae and Asteraceae Cichorieae). Nonetheless, arboreal taxa (such as *Quercus ilex*-type, *Pinus*, *Juglans* and *Vitis*) were also identified.

4. Discussion

4.1. *Diet*

Archaeobotanical analyses have proved to be useful to reconstruct the diet of the Phoenician inhabitants of Motya. In terms of plant components, these were represented by cereals, pulses, and fruits. The most abundant cereals are hulled barley and bread wheat,

[10] Moricca *et al.* 2021b.
[11] Moricca *et al.* 2020.
[12] Moricca *et al.* 2021a.
[13] Fægri - Iversen eds. 1989.
[14] Moricca *et al.* 2021b.

coherently with data from the coeval western Sicilian sites of Monte Polizo and Selinunte.[15] While *T. aestivum/durum* grain kernels are obtained from spikes following threshing, the palea and lemma of hulled barley closely adhere to the grain kernel, requiring a more complex process before human consumption.[16] For this reason, it is possible that hulled barley was used as fodder, along with chaff and vetches (e.g., *Vicia ervilia*). Interesting is the finding of naked barley (fig. 1b), which begins to disappear from Mediterranean assemblages starting from the Iron Age/Roman period.[17] While it is much easier to process than its hulled counterpart, naked barley is more susceptible to insect attack and parasitic diseases and was slowly replaced by the higher-yielding naked wheats.[18]

Green peas, lentils and faba beans (fig. 2), and different fruit taxa complemented the diet of the inhabitants of Motya. These comprehend fig achenes (preserved both by charring and mineralization; fig. 3a), olive endocarps, hawthorns (*Crataegus monogyna* Jacq. and *Crataeugus* sp.) and numerous grape pips (fig. 3b). Morphometric analyses allowed to suggest not only that they all represent domesticated grapevines, but also that more than one *Vitis vinifera* variety was present at Motya during the Phoenician occupation.[19]

Worth of attention are the remains of six pomegranate endocarp fragments (fig. 3c), and a stone pine nutshell fragment (fig. 3d) and a bract. These represent respectively the oldest finds in Sicily and in Italy. While pomegranate is believed to have been imported by Phoenicians from the east,[20] the origins of *Pinus pinea* L. are harder to assess due to its extremely low genetic variability.[21] Nonetheless, studies show that it was present in the Iberian Peninsula for thousands of years and it is probable that Phoenicians played a role in its spread.[22] *Juglans regia* L., found in the anthracological assemblage of the sacred context and in the pollen spectra of F.1112, also represents a plant introduced to Sicily in the 8th-7th centuries BC.[23]

4.2. *Past environment and land use*

Pollen data, characterized by a dominance of non-arboreal taxa, allow to describe the past landscape at Motya as open, with limited tree cover, home of complex anthropogenic activities.[24] Anthracological data completes the local environmental image, with wood taxa strictly related to the Mediterranean maquis (*Quercus* evergreen, *O. europaea*, *P. lentiscus*, *Rhamnus*/*Phillyrea*, *Erica arborea* L., *Erica multiflora* L.).

The combination of carpological, anthracological and palynological analyses represents a mean to gather data concerning land use during the Phoenician-Punic occupation of Motya. The finding of *Vitis vinifera* seeds, charcoals and pollen suggests that this could

15 Stika - Heiss - Zach 2008.
16 Cappers 2018, 44-48.
17 Lister - Jones 2013.
18 Lister - Jones 2013.
19 Moricca *et al.* 2021a.
20 Nigro - Spagnoli 2018.
21 Pinzauti *et al.* 2012.
22 Mutke *et al.* 2019.
23 Sadori 2013.
24 Moricca *et al.* 2021a.

have been cultivated on-site. A similar conclusion could be drawn for cereals, whose caryopses, chaff, and pollen grains were found, suggesting that plant processing, if not even cultivation was carried out on the island. These data support the hypothesis advanced by Prof. Nigro based on a demographic model, suggesting that 14 ha of the site were used for cereal cultivation and 6 ha for vineyards.[25] Surprising is the lack of *O. europaea* pollen, contrasting with the abundance of charcoal fragments and the retrieval of olive endocarps. Given their limited height and not yielding an optimal crop before they are 25-30 years old, olive trees are cultivated mostly for their fruits rather than for timber.[26] The high concentration of *O. europaea* wood thus suggests local growth.

Parallels can be drawn between the past and present environment at Motya based on anthracological data. *Juniperus* sp. and *Erica arborea*, once present at the site, no longer grow within a 40 km radius from the island. This is probably due to land over-exploitation and/or aridification, as juniper recovers less easily than other plants of the maquis after a fire, while *E. arborea* requires a deeper and more developed soil than *E. multiflora*.

4.3. *Votive offerings*

An important set of information provided by archaeobotany concerns votive offerings nearby the temple of "Cappiddazzu" at Motya. The retrieval of grape seeds, fig achenes and a *H. vulgare* caryopsis allows to hypothesize a ritual meal accompanying animal sacrifice,[27] or simply the presence of food offerings. Peculiar is the finding of a mineralized *Cupressus* cf. *sempervirens* (cypress) twig, one of the first plants believed to be introduced solely for ornamental purposes,[28] often associated to the funerary world.[29] The carpological assemblage, rich in *Ajuga iva* L. and Asteraceae remains, characterized by colorful flowers, also allows to hypothesize flower offerings.

Finally, it is interesting to highlight the high concentration of plants with medicinal properties, traditionally used for the treatment of skin disorders, cardiovascular diseases, and other pathologies. These include *Borago officinalis* L., *Echium plantagineum* L. and *Urtica urens* L. These could be related to the Phoenician god Melqart, titular deity of the temple, who, at Motya, also includes some salvific aspects of Eshmun, a healer god.[30]

5. Conclusions

The archaeobotanical analyses conducted on the site of Motya provide crucial information concerning the daily life of the Phoenicians on the site, specifically in terms of their plant use and interactions with the environment. Their diet was comprised of cereals (mostly hulled wheat), legumes and numerous fruits. Amongst these, pomegranate and stone pine represent the earliest findings in Sicily, supporting the hypothesis that Phoenicians favored their spread.

25 Nigro 2017.
26 Valamoti - Gkatzogia - Ntinou 2018.
27 Amadasi Guzzo 2008.
28 Zocca *et al.* 2008.
29 Edmonds 2010.
30 Moricca *et al.* 2020.

Combined evidence of plant macro- and micro-remains was crucial for reconstructing the past cultural landscape, characterized by little tree cover, Mediterranean vegetation, and complex anthropogenic activities, also allowing a comparison with the present-day flora. Hypotheses concerning the management of land are also advanced. Viticulture was likely to have been practiced on the island, and cereals were processed (or even cultivated) on-site. Olive tree cultivation is also suggested based on the abundance of timber.

Votive uses of plants were also investigated. These include the offering of cereals, grapes and figs, but also of flowers. Furthermore, the presence of plants with medicinal properties may have been related to the cult of the god Melqart.

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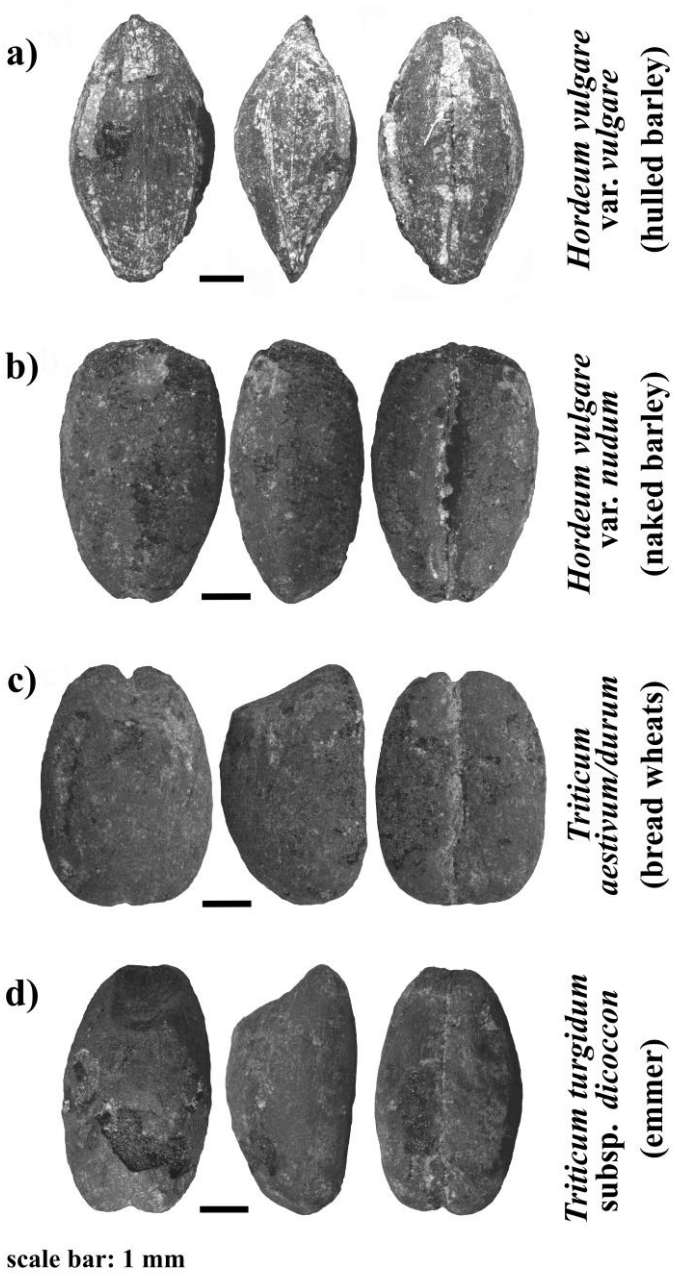

Fig. 1 - Selected cereals retrieved in archaeological layers at Motya, from left to right: dorsal, lateral and ventral views (photos taken and processed by the Author).

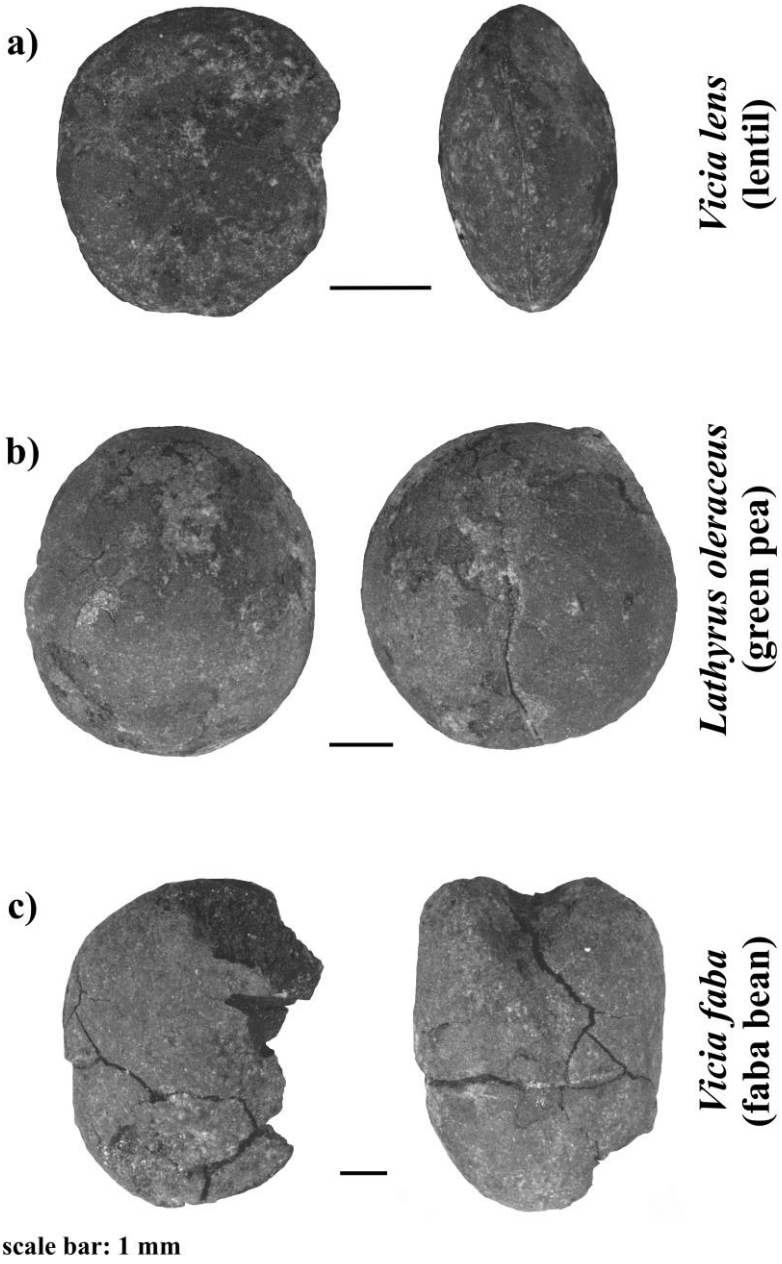

Fig. 2 - Selected pulses collected from archaeological layers at Motya (photos taken and processed by the Author).

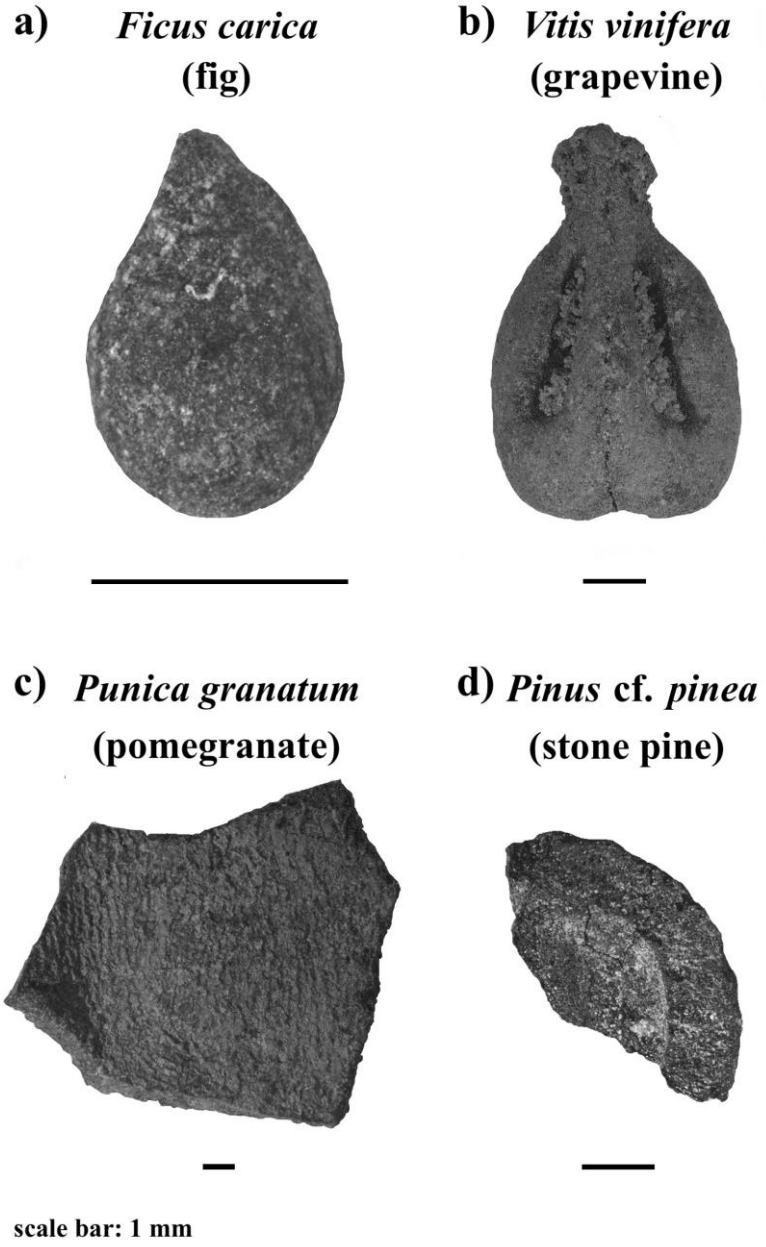

Fig. 3 - Archaeobotanical remains of fruits found in F.1112 at Motya (photos taken and processed by the Author).