

THE ARCHAEOBOTANY OF GRAPEVINE IN THE CAUCASUS AND NORTHERN BLACK SEA REGION

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1. Introduction and objectives

The area between the Northern Black Sea region, the Caucasus and the Caspian Sea is considered to be a primary centre for the domestication of grapevine, with high relevance for the further distribution of the crop towards the Mediterranean basin and for the development of the European modern cultivars. The wild species, *Vitis vinifera* ssp. *silvestris*, the putative ancestor of the cultivated grapevine, still occurs throughout this region.

The strategic objectives of the archaeobotanical project are to enhance the value of archaeological plant material in tracing the history of grape vine and to export the results of the archaeobotanical investigation from the archaeological field to the agrarian one.

2. Background

The Caucasus as centre of origin

Over the past 2 centuries, many authors (de Candolle, Vavilov, Negrul, Zhukovsky, Olmo, Mathon and Zohary and Hopf) pointed out the relevance of the region between the Black Sea, the Caucasus and the Caspian Sea as a possible primary centre of origin of grapevine

According to Vavilov (1957, 1960, 1965), agriculture evolved in mountainous regions; in this context he views the Caucasus as an extensive ecological laboratory in which basic ecotypes formed over thousand of years. He pointed out that Transcaucasus was also the birthplace of the wild and cultivated grape. The very large number of various aboriginal kinds of grapes in Georgia, Armenia and Azerbaijan...indicates a concentration of the formative process here.

Olmo (1976) believed the process of domestication to have developed within the distribution range of wild grapevine, between the Black Sea and Afghanistan, excluding any possible role of the post-glacial refuge areas of southern Europe.

According to Olmo (1996), at the beginning of the Neolithic period, wild grapevine covered the same distribution range as during the Pleistocene period, ranging from the Mediterranean to the Caspian Sea and beyond, and still today different varieties (ecotypes) of wild grapevine grow spontaneously in a vast area spreading from Anatolia as far as Pakistan.

Geographical and agro-botanical investigations highlight how the Caucasus and the near bounding areas represent the most important regions both for the study of varietal (ecotype) diversity of wild grapevine and for knowledge on the process of domestication that involved the whole of southwest Asia.

The importance of the Caucasus as a centre of formation of major cultivated plants is not confirmed only by the “geography of plants” but also by the excavation of new archaeological materials, which elucidate the time and paths of the establishment of agriculture in the Caucasus.

Archaeological and scientific importance

Genetic studies and archaeobotanical data collected between the 1950s and 1970s made an important contribution to understanding the genealogy of the grapevine and of the centre of origin and diffusion of cultivated grapevine (Renfrew 1973, pp. 125-131).

More recent archaeobotanical materials dated to the seventh-sixth millennium BC confirm the deduction of the botanist who regards the Caucasus as an independent hearth of a food-producing

economy. This particularly refers to wheat, barley, rye and grapevine too, whose remains have been found in various Neolithic settlements.

Plant remains from archaeological excavations provide a major source of information on the grape vine exploitation from the Neolithic period onward but, despite the high level of local grape vine diversity and the intensive archaeological investigation in the region, the archaeobotanical record is limited.

The importance of grape pips

Archaeological pips can be considered the most significant element for the study of the exploitation and domestication of the grape vine; they represent also a very important source of information to explain the evolution of wine-production.

Due to the selection and the cultivation processes, cultivated plants differ from their wild progenitors and changes appear in the reproductive organs of the plant populations or clones cultivated for their fruits and seeds.

Generally speaking the seeds and fruits of most of cultivated plants are bigger than those of their progenitors and the shape can be slightly different, according to the agro-technical processes.

Several scholars have dealt with the history of viticulture trying to use size and shape of the pips as indicators of selection and domestication. The basic imperfectness of the methods lies in the fact that they used only three measurements and (mainly) that we know very little about the variability of the pips in the current and past biodiversity of the grape vine.

According to the studies carried out by Facsar, shape and size of the pips are more ecotypes specific than believed in the past: using morphological characters and biometric parameters of the seeds it is possible to distinguish their belonging to wild or cultivated species and also their reference to a precise ecotype, if documented. Facsar proposed to take ten measurements for each grape seeds: seven in dorsal and ventral view and three in profile.

Combining the measurements proposed by Facsar and the feature of the pips in dorsal and ventral views as classified by Tiffney and Barghoorn (1976), we are rather confident to have correctly characterized the seeds.

The use of an image-analysis software in a multi-focus stereomicroscope proved to be very useful to classify and to sort fresh and archaeological pips.

3. Activities

In line with the main strategic objectives the following activities have been undertaken for the territory of Georgia:

- survey of the archaeobotanical/archaeological informations;
- contact with local archaeobotanists/archaeopalynologists;
- evaluation of the recovery methods used to collect archaeological plant material;
- definition of a protocol of analysis for the archaeological and fresh pips;
- exchange of information and technology;
- organization of a database of the archaeobotanical collection.

At the beginning of the project the archaeobotanical information available or known in the most common publications were limited to 10; the collaboration with the Georgian colleagues N. Rusishvili and E. Kvavadze allowed us to add other seven records and, after a year of work, the number of the sites with grape vine evidences is now 42.

The site of Tsichia Gora (n-w of Tbilisi) has been proposed by the Georgian archaeologists as a possible test excavation because its long cultural sequence, from early Bronze age to the first century BC, but mainly for its important vine making building of Hellenistic period. The site, partially excavated more than ten years ago, yielded some thousand of grape pips. The material, under investigation by Nana Rusishvili with conventional methods, has been used to carry out morpho-biometrical analysis in digital mode to compare their variability in size and shape with the results of the image analysis of a reference collection of pips from *Vitis silvestris* and *Vitis vinifera*, kindly given to us by Prof. Scienza, University of Milan, in the framework of the project.

4. The archaeobotany of grape vine in Ukraine and Moldova

In the USSR, in the early 1920s, the first studies on archaeological plant remains were done at the All union Institute of Plant Breeding in Leningrad by co-workers of N. I. Vavilov (among others K.A. Flaksberger, A.I. Mordvinkina, V.F. Antropova, M.M. Yakubtsiner). Later much work was done at the Institute of Archaeology of the Academy of Sciences of the USSR by A.V. Kir'yanov (1959) and L.V. Prishchepenko (Lisitsyna, Prishchepenko 1977) and at the Academy of Sciences of the Latvian SSR by A.P. Rasin'sh (1959). Incidental analysis of archaeological plant remains from Ukrainian sites, performed in the 1930-1940s and early 1960s, were reviewed by Z. V. Yanushevich (1976).

Since 1964, systematic archaeobotanical investigation were carried out by Yanushevich at the Botanical Garden of the Academy of Sciences of the Moldavian SSR in Kishinev. They concern first of all Moldavia and Ukraina (1986)

In 1976, regular investigation were started at the Institute of Archaeology of the Academy of Sciences of the Ukrainian SSR in Kiev by G.A. Pashkevich (1980, 1983, 1984)

The basic assemblage of cereals and pulses was established already in the Neolithic and showed distinct affinities to the Near Eastern centre of agriculture. Archaeobotanical remains of grape vine were found in a few settlement situated in the southern part of the area. A few pips from Bronze Age Etuliya were typical of wild *Vitis vinifera silvestris*. Transitional forms between wild and cultivated vine wre discovered in the Greek site of Olbia and in the Roman site of Sychevka. So far there is no evidence of vine cultivation in this area.

Crimea Peninsula differed distinctly from Ukraina and Moldova, as far as the assemblage of main cereals is concerned. Vine seeds were common in prehistoric material from Crimea. In greek sites from the 4th-2th century bc mixtures of seeds of typical wild and cultivated vine and transitional forms wre often present.

The collaboration with G.A. Pashkevich will certainly improve the knowledge on the archaeobotanical investigation carried out in the Ukraina and Moldova and will give a substantial contribution to the data base of the archaeological evidences of *Vitis*.

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