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PLANT ECONOMY AND VEGETATION DURING THE EARLY NEOLITHIC OF BULGARIA

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INTRODUCTION

The territory of modern Bulgaria is situated on one of the routes of distribution of early Neolithic agriculture from the Near East to Europe. One of the sources of information about the dispersal processes is the archaeobotanical studies carried out on Neolithic sites in the area. Although there are numerous archaeobotanical studies on the Bulgarian Neolithic, these from its earliest stages are still scarce. The reasons for this are of different nature, but probably the most important is the lower density of such sites compared with the later stages of the Neolithic.

In this contribution an overview of the early Neolithic plant economy of Bulgaria will be presented in relation to the later stages of the Neolithic and in comparison with the information from the neighboring regions.

The first farmers of Bulgaria settled in the foothills around the Thracian plain and in those of south-western Bulgaria. Possibly the Struma valley played an important role during the introduction of Neolithic subsistence from Thessaly to Bulgaria (Perles 2001; Nikolov 2004). It is still a matter of dispute whether the new subsistence arrived from Greece exclusively or from Anatolia via Turkish Thrace or from both regions (Özdoğan 2008).

THE ARCHAEOBOTANICAL INFORMATION BY REGIONS

The different geographical conditions in the study area suppose also the division of the study area in different regions with certain differences in the cultural developments of the study area. In the following the four sub-regions widely accepted also in the archaeological literature will be used: Struma valley (Southwest Bulgaria), Thrace and Southeast Bulgaria, Nordwest Bulgaria, Nordeast Bulgaria.

For the area of the Struma valley until now archaeobotanical information on the Early Neolithic from ca. 8 sites exists [Kovachevo (Kovačevo) (Marinova 2006), Eleshnitsa (Elešnica) (Dotcheva not published), Slatina (Dotcheva 1990, Marinova 2006), Galabnik (Gâlâbnik) (Marinova *et al.* 2002), Chavdar (Čavdar) (Dennel 1978), Balgarchevo (Bâlgarčevo) (Marinova in print, a), Kremenik-Sapareva Banja (Čakalova, Sârbinska, 1986) Vaksevo (Popova 2001)].

The main cultivated crops were the hulled wheats einkorn and emmer. Usually they were cultivated together and it depends on the growing condition if the more resistable to unfavorable conditions einkorn or more productive emmer will prevail. In the sites Kovachevo, Slatina and Eleshnitsa seems that the einkorn is more important in the first stages of their occupation. For the later stages of the Early Neolithic in the Struma valley it seems that also emmer starts to prevail and this is especially good visible in the archaeobotanical record of the second half of the Early Neolithic in Kovachevo, Slatina, Balgarchevo, Galabnik and Chavdar. In this evidence could be connected with climatic factors, but also with local conditions and adaptation on the surrounding environment. For example at the site Kremenik-Sapareva Banja, situated in mountainous environment, the dominating cereal crop through all of its occupation is einkorn. Modern observations of einkorn fields have shown thet in difference to other cereal crops (like emmer), the einkorn is very resistant against beating down from heavy rains (Kreuz 2007). This ability was most probably the deciding factor for prevailing of einkorn during the earliest stages of the Neolithic, especially if the paleoclimatological reconstructions for this period speak for more temperate and wet summers than today (Davis *et al.* 2003). Further the einkorn is quite good adapted to cold conditions and frost so has some advantages over emmer in mountainous regions. Most probably the combination of complex factors have let to prevailing of the not so productive, but resistant to unfavorable conditions einkorn.

Except of wheats also barley was grown, in the Early Neolithic this mostly is hulled barley (storage find from Vaksevo), but naked occurred too (storage find from Galabnik).

The leguminous crops or pulses are the next of importance group of cultivated plants grown in the area, most abundant and numerous of them were lentils, pea and grass pea. The finds from chick pea during the final stages of the

Early Neolithic from Kovachevo, Galabnik and Balgarchevo are particularly interesting. It was spread from the Near East to southeastern Europe during the Neolithic, but until recently it was not thought to have reached further north than the territory of modern Greece. Its appearance is most probably connected with the cultural processes during the second part of the Bulgarian Early Neolithic (5700–5500 B.C.) in which repeated contacts with Anatolia have been observed in the archaeological record. The chick pea finds from the Bulgarian final early Neolithic are more or less synchronous with those from western Anatolia. They come from the early Chalcolithic of Ilıpınar, and are dated from 6700–6545 B.P. to 6605–6580 B.P., or about 5630–5407 cal B.C. (Cappers 2001). Therefore, a probable option is that the finds from the Bulgarian early Neolithic correspond to direct contacts with Anatolia, which took place through the eastern part of the study area and not necessarily through Thessaly, from which such finds are lacking until mow. One hint for this could be that the earliest radiocarbon date for the Bulgarian chick pea finds comes from the site, Kapitan Dimitrievo. Also, the evidence based on pottery of contacts with Anatolia and Thrace established at Kovachevo Ic and Id (Lichardus-Itten *et al.* 2006) could argue for this hypothesis. Given the scarce evidence available, further studies are needed to confirm this suggestion.

One of the earliest of considered sites seems to be the site Kovachevo. The site gives the opportunity for investigating the earliest stages of the Neolithic agriculture and associated anthropogenic vegetation change at the territory of modern Bulgaria. Thanks to the excellent support of the interdisciplinary works at the site by the team of the excavators extensive archaeobotanical information was collected. Comparable with only few other sites in the region the botanical material was collected through flotation sampling, during several excavation seasons and great variety of plants were recorded: more than 60 species, genera or others were identified. In comparison for the most of the other Early Neolithic sites studied in the Struma valley usually not more than 10–15 plant species or genera were identified. The general picture provided information on the plant subsistence of the site and can be used as example to get idea on it for the other sites in the region.

For example thanks to the flotation sampling wide variety of collected wild growing plants is available from the site. The fruits of cornel, wild grapes, plum, raspberry, blackberry, strawberry, physalis/winter or bladder cherry, hazel, elder, mountain ash and apple/ pear were collected and consumed either immediately or later, in dry state.

No pollen-bearing sediments have so far been found near the Early Neolithic sites in the South Western Bulgaria and information about past vegetation could only be gained through studying plant macrofossils recovered from the archaeological settlement layers, especially useful for this are the wood charcoals. They usually are the most abundant plant macroremains found in the settlement layer and have the advantage to belong to the vegetation used from the immediate surrounding of the sites. Information of the wood charcoal analysis or anthracology for the Struma valley is available from the sites Kovachevo and to more limited extent from Balgarchevo and Galabnik.

The most abundant and frequently used wood was deciduous oak. The deciduous oaks prevailing in the vegetation of the area were obviously used for fuel and building materials. In Kovachevo wood charcoal of species from outside oak forests was present in very low quantities. This probably indicates that the oak forests were well developed and extensive enough to cater for most wood needs, making it unnecessary to enlarge the area exploited to supply wood. According to the analysis of burnt posts oak was one of the main woods used for building material.

Results of anthracological studies showed that during the Early Neolithic (6159–5630 cal B.C.) the vegetation in the area of Kovachevo was dominated by open deciduous oak forests. This forest was the most widely used vegetation, although riverine forests and pine stands, probably in close proximity to the site, were also reachable by the Neolithic population (Marinova & Thiebault 2008). Land use and management by early Neolithic communities in the region favoured the opening of forested areas and lead to an increase in area of forest edge zones and secondary forests. Such changed habitats were useful for grazing animals, collecting fruits, fodder, firewood and the protection of arable fields. Hence the subsistence practices adopted by Neolithic farmers subtly shaped the wooded landscape with only slight and gradual changes in forest composition and transition to secondary forest and managed hedges of variable extent. So this shows that the anthropogenic modification of the vegetation was gradual and this fits well also with the results of comparable studies of Neolithic wood charcoal assemblages from northern Greece (Ntinou & Badal 2000) and Turkey (Asouti & Hather 2001)

The region of the Thracian plain and the adjacent areas is the best studied in Bulgaria from archaeobotanical point of view. Nether less the information about the Early Neolithic comes from six sites and give information mainly on the second half of the Early Neolithic: Rakitovo (Bozilova & Tchakalova & Bozilova 2002), Kapitan Dimitrievo (Marinova 2006, Marinova in print, b), Azmak (Hopf 1978), Karanovo (Thanheiser 1997), Okrazhna Bolnitsa (Lisitzyna & Filipovich 1980), Yabalkovo (Leshtakov *et al.* 2007). In is of importance to mention that in 3 of the sites – Karanovo, Kapitan Dimitrievo and Yabalkovo extensive flotation sampling was applied, so representative and broad information is available.

In the most of the sites the dominating cereal crops is the emmer especially for the later stages of the Early Neolithic. Similar to the Southwestern Bulgaria here also the main leguminous crops found are pea, grass pea and lentil, the first two found also as storages. Special interest deserves the site Kapitan Dimitrievo. Its geographical position supposes connections as with the Struma valley as well as with the Thracian plain. Also of importance is the excellent preservation of the botanical materiel at the site, what allow to gather very detailed information. One of the earliest evidences for food cooking from the region of Southeastern Europe comes from this site, as detailed analyses of bulgur-like cereal remains have shown (Valamoti *et al.* 2008). The most common for the site cultivated leguminous plant during all of the Neolithic is the grass pea – the same most common for southwestern Bulgarian Early Neolithic.

In Kapitan Dimitrievo also the only find of chick pea for the Thracian plain is present. Until now all other such finds appear in southwestern Bulgaria (Marinova & Popova 2008). Like in southwestern Bulgaria, also in the Early Neolithic of the Thracian plain numerous wild growing plants could be found in the after applying flotation sampling. In Kapitan Dimitrievo beside of the common for the study are collected plants also fruits of terebinth were used. This is a sub-Mediterranean plant rich in etheric oils found in many Neolithic sites in Greece and Turkey; it could be considered as indication also for at least similar environmental conditions with this areas. Another interesting plant found in the archaeobotanical record is the woolly distaff thistle an indicator for forest free habitats in the surrounding of the site. This means that the first farmers in the are found an still not completely covered by forest landscape with sub-Mediterranean vegetation. In the earliest Neolithic of Tell Karanovo also remains of fig fruits were found (Thanheiser 1997). As the fig plant with subtropical origins, but can grow spontaneously on the territory of Bulgaria, most probably this early finds mean that it was brought by the humans with or without intention from the Medieterrenean region.

From the Early Neolithic of Northeastern Bulgaria archaeobotanical information is available from five sites: Polyanitsa Platoto (Hopf 1988), Dzhulyunitsa (Marinova, not published), Orlovets (Marinova 2007), Koprivets (Marinova 2007), Malak Preslavets (Panayotov *et al.* 1992). In the most of the sites only few samples are analyzed so the available until now dataset on the region is not completely representative. In general it seems that the dominating cereal crop was again the resistant to not so favorable conditions einkorn. The most common leguminous crops are similar to those from southern Bulgaria: lentil and pea. In only one of the studied until now sites – Dzhulyunitsa also grass pea occurs. Except of southern Bulgaria the grass pea occurs in some Neolithic sites inn Greece, but is lacking from Serbia and Romania (Fischer & Rösch 2004). For Anatolia this crop plant gain more importance during the late Chalcolithic about 6700 BC, although is also available in small quantities during the earlier periods (Nesbitt 1996).

In the region of Northwestern Bulgaria almost no significant archaeobotanical information on the Early Neolithic exists. Until now only the information from one site – Ohoden (Marinova, not published) can give us brief insight in the plant economy of the region. The agriculture of the site, like in the other sites in the region, was based on hulled wheats (einkorn and emmer), barley and leguminous crops (lentil and pea). The other known from the Southern Bulgaria crop plants are lacking until now from the Neolithic archaeobotanical materials from Ohoden. Further studies are needed to proof if this is due to real absence of these crops or to bad preservation condition characteristic for the site and restricted study area.

The wood charcoal analysis at the site showed that together with the oak forests the wet areas around the rivers were used as additional source of plant resources for the Neolithic inhabitants of Ohoden. At the site, as in the situated in Northeast Bulgaria Djuluynica also evidence of collection of the water chestnut was found. The plant produces a nut-like fruit that can be cooked, eaten out of hand, or used in other foods. It is known from other prehistoric sites in Romania (Fischer & Rösch 2004) and Hungary (Bogaart *et al.* 2005). Its presence indicates presence of shallow, nutrient-rich water basins in the surrounding of the sites.

At the site also feather grass was found. This steppe plant arouses the question of existence of open grassland areas in the supposed to be covered with woods landscape and as the evidence from southern Bulgaria indicates that probably it had more mosaic structure combining light forests with more or less open areas.

CONCLUSIONS

Considering the plan spectrum found at the Early Neolithic sites of Bulgaria and the found storages of cultivated plants, it could be concluded that almost all of the typical for the Neolithic and Chacolithic cultivated plants were present already during the earliest stages of the Neolithic. Hence the cultivated plant inventory arrived as the defined by Zohary and Hopf (2000) Near eastern crop assemblage.

The plant economy of the sites situated south of the Balkan mountain shows basically homogeneity in terms of crop plant composition, used wild resources and weeds accompanying the fields. Some regional variations are noticeable between the Struma valley region and the Thracian plane, mainly in the second part of the Early Neolithic. During this period in Thrace start to dominate emmer and in many sites from the Struma valley a new crop plant – chick pea – appears. Basically the same plant economy, but a smaller spectrum of used crops, compared to southern Bulgaria, is visible in the northern part of the considered study area. This should be related more to the not enough large data basis collected from there, than as real absence. A hint for this is for example the grass pea quite wide spread in southwestern Bulgaria, found also in Dzhulyunitsa. To proof reliable this hypothesis the future efforts of the studies of Early Neolithic agriculture and land use of Bulgaria should cover also the northern parts of the region.

The found wild growing plants, especially from the sites in southern Bulgaria allow reconstruction of a variety of natural habitats used by the Neolithic inhabitants of the sites. In general the wide spectrum of wild collected plants also shows a good knowledge and optimal exploitation of the wild plant resources during the considered period.

The wood charcoal analyses of several sites show domination of light oak forests, in southern Bulgaria rich in sub-Mediterranean elements too. Beside of them also not forested or not dense forested area were present. This evidence shows that the Neolithic population had quite riche and favorable environment available and this offered good conditions for plant economy from the type known from the modern Greece and Anatolia.

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