

# THE ETHNOBOTANY OF *BOLBOSCHOENUS MARITIMUS* (CYPERACEAE) IN CENTRAL ANATOLIA

## *BOLBOSCHOENUS MARITIMUS* (CYPERACEAE) SAZ BİTKİSİ ÜZERİNE İÇ ANADOLU'DA ETNOBOTANİK BİR ÇALIŞMA

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**Keywords:** *Bolboschoenus maritimus*, Neolithic, Central Anatolia, ethnobotany, wild food plants.

**Anahtar Sözcükler :** *Bolboschoenus maritimus*, Neolitik, İç Anadolu, etnobotanik, yenebilen yabancı besin bitkileri.

Günümüz köylerinde yapılan ayrıntılı bir etnobotanik araştırma sayesinde İç Anadolu'da Neolitik dönemde bulunan beslenme amaçlı bazı yabancı bitkilerin kullanımı, işlem den geçirme teknikleri ve sosyal açıdan önemi açıklık kazanmıştır. Araştırma, bu eski yerleşimlerin arkeobotaniğine ilişkin çeşitli sorular yöneltmesini sağlamıştır. Bu yabancı bitkilerden biri olan ve yerleşimlerin coğrafik dağılımlarına göre halk arasında çeşitli isimler alan *B. maritimus* (saz, bapra, bafra, kovalık, kovalak), tarım öncesi yarı yerleşik gruplar için olduğu kadar ana beslenme maddesi tahıl olan topluluklar için de hem olası bir besin maddesi, hem de yapı malzemesi olarak önemlidir. Burada, bu bitkinin günümüzde kullanım alanları çeşitli yönleriyle incelenerek arkeobotanik kalıntılara ve bitkinin toplanması, işlem den geçirilmesi, depolanması, kullanımı ve tüketilmesi aşamalarında kullanılmış olduğu düşünülen aletlere ışık tutulmuştur.

Food has been one of the basic needs of living organisms during their life-span. To consume food, humans developed different strategies depending on what their environment offered. Rich resources of trees with edible and nutritious fruits, large mammals, domesticable wild food plants, and their availability from close vicinities motivated people to adapt different management strategies. In recent years, the in depth ethnobotanical and archaeobotanical studies revealed the importance of the wild food plants even in the diet of communities with advanced food economies.<sup>1</sup> The abundant recoveries of plant remains from the archaeological sites allowed us to learn much information about the past human diets and their effects

on human groups. It changed our views of the subject in a considerable way.

This sedge species was studied as part of the MSc thesis of the present author that was on 'The Ethnobotany of Wild Food Plants in the Konya Basin'. The thesis focused on wild nuts, fruits, and tubers that grew in the Konya Basin. The taxa list identified included the Genera of *Bolboschoenus*, *Pistacia*, *Rhus*, *Amygdalus*, *Pyrus*, *Prunus*, *Crataegus*, *Celtis*, and *Quercus*, all growing in the Konya Basin today and of which remains have been recovered from the early levels of the excavations in the region. This ethnoarchaeological study concerned several complementary parts which mainly comprised

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the archaeological and ethnobotanical data.

## METHODS

This study was aimed to analyse the wild food plant use by the past societies. Central Anatolia as one of the best studied areas with several Neolithic sites and as a geography encompassing different types of vegetation zones was chosen as the research area (Fig. 1). Neolithic and Early Chalcolithic were the time periods selected to be examined in this study as important changes about the diets and subsistence strategies of human groups occurred in these periods (Fig. 2). This knowledge was explored through ethnobotanical research strategies. The degree of the importance of wild food plants was demonstrated in the archaeological evidence including the available archaeobotanical data. The relationship between the local people living in the modern villages of the Konya Basin and the wild food plants still growing in the region as in the past was studied in detail with the tools used alongside the taphonomic effects. Because it was possible to study similar environments today in the Konya Basin, nine modern villages to collect ethnobotanical data were chosen from three different environmental zones in this area, which included wetland, forest and steppe zones. The different strategies of harvesting, processing and storage which local people used for the consumption of each plant species provided useful implications to archaeological recoveries.

Archaeobotany attempts to bring explanations to plant remains recovered from archaeological deposits by considering various ways people interact with plants. Mixture of crop plants, weeds and wild plants are the archaeological remains of the plants gathered for food. Sometimes it may not be very easy to distinguish which traces in the archaeological context belonged to food activities and which to non-food ones; thus several theories contributed by experimental works and ethnoarchaeological research have been developed concerning the

interpretation of these archaeobotanical remains and site formation processes. Sampling strategies and the conditions of the preservation of the archaeological material have played an important role in how much of the actual material lying beneath the soil was recovered and how much it in fact represents the whole site.

## THE CHARACTERISTIC OF *B. MARITIMUS* AND ITS GEOGRAPHICAL DISTRIBUTION

The sedge family Cyperaceae that *B. maritimus*<sup>2</sup> (previously named as *Scirpus maritimus*) belongs, includes 90 genera and some 4,000 species. It prefers wet and open habitats. *B. maritimus* (club-rush, bulrush, saltmarsh, Fig. 3) is a glabrous, rhizomatous perennial with fleshy roots (Townsend, Guest 1985) and stems up to 1-1,50 cm (Tan 1985). The inflorescence normally bears large numbers of the shiny, dark brown, angular seeds (Hillman 2000). The seeds, tubers and shoots are edible and possibly nutrient-rich resource (Kantrud 1996). It grows up to altimeters c. 600-950 m. by fresh water wetlands such as streams, along ditches, edge of swamps, shallow pools from irrigation canal overflow, and sometimes in saline places, also as a weed in ricefields (Townsend, Guest 1985; Tackholm, Drar 1950).

The species was abundant in Konya Basin twenty years ago. On the lands where now Çatalhöyük excavation buildings are, a dense *B. maritimus* habitat was used as midden area by Küçükköy villagers. Today, due to heavy drying of the wetland ecological zones of the region, it grows along the irrigation ditches as occasionally dense and homogenous groups (some 10 m. in length) between mixed *Phragmites* and *Typha* groups. Until 8 years ago, it grew in large stands in Taşağıl, Pınarbaşı, Karahöyük and Adakale villages by Hotamış Gölü, now almost totally dry, on the north of Can Hasan sites; by Acı Göl (dried totally ten years ago) by Pınarbaşı sites; on the north and west of Dedemoğlu village in Kocaçay River and in Arpa Çayırı located on the west of Çatalhöyük; on the northern

border of Konya in Astın Meadow; on the southern border of Konya closeby Toros slopes; and in the western borders of Konya neighboring the Lake District by Beyşehir Lake. Today, the steppes where *B. maritimus* used to grow are extensively covered with *Juncus* sp, another sedge species without tubers and shorter than *B. maritimus* in size. The marshlands and lakes started drying in early 1990's. When the first visit to the areas was undertaken by the present author in June 1998, only a small patch of marshland by Adakale village was left of the Hotamış Lake. Acıgöl (Süleymanhacı Gölü), which still existed in 1993, was already completely dry. Further south, the marshland by Hamidiye shown on the maps drawn in 1950's was totally gone. Arpa Çayırı marshland by Dedemoğlu village was replaced by an arid environment type as well. Nevertheless, as stated by the geomorphologists, the drying of the lakes make a similar environmental condition to that of the Neolithic Period in the region.

#### THE RECOVERY OF *B. MARITIMUS* IN THE ARCHAEOLOGICAL RECORD

The use of this plant as an important resource in a wide geographic area dates back to very early times. The tubers, seeds, and stems of *B. maritimus* have been found abundantly at several Prehistoric sites. The important reason to this is because early human groups in the Near East mostly settled by water resources and many wetland areas included plant species from Cyperaceae family, including *B. maritimus*. The plant was extensively used for various reasons beside its consumption. Both tubers and nutlets were recovered in the charred remains of human faeces from the Late Pleistocene hunter-gatherer site of Wadi Kubaniya (18,000 BP) in northern Egypt (Hillman, Madeyska, Hather, 1989). The nutlets of sea club-rush have also been found in the early periods in the Near East including the Epipalaeolithic and Neolithic sites of Hallan Çemi Tepesi and Çayönü in Anatolia, Abu Hureyra in Syria, several early sites in the Azraq basin of East Jordan, in the Levantine cor-

ridor, and at Çatalhöyük (7400-6200 BC) both as nutlets and tubers in relatively large quantities (Hillman, Colledge, Haris, 1989; Rosenberg, 1994; Van Zeist, De Roller, 1991-1992). Such an extensive recovery of the plant points to its value both in the times prior to the emergence of agriculture and when the societies depended on domesticated cereals and pulses as the main carbohydrate resource, as it was in Çatalhöyük.

#### THE LOCAL USE OF THE PLANT AND ITS ARCHAEOLOGICAL IMPLICATIONS

Ethnobotanical data collected concerning the harvesting and processing of the plant for non-food uses has made important contributions in understanding the taphonomy of the charred plant remains recovered from various excavations and debated for its different uses. In the villages situated in wetland zones, all parts of club-rush were used in several ways; causing the abundance of their charred form inside and outside houses. The use of this plant was very common because of its durability in a damp environment. Its long and flexible stems made the plant valuable in this area for plaiting mats and baskets.<sup>3</sup> The plant supplied building material and fuel resource in these environments that lack woodlands. The nutlets supplied fodder for animals in late summer when the wild grasses in the area turned yellow, and the plant preserved green reserves for livestock in winters. Club-rush stems replaced the function of the cereal straw in wetland areas with saline soil.

##### 1. Construction Material

Before the human manipulated severe drought, in wetland areas such as Dedemoğlu by Arpa Çayırı and Adakale by Hotamış Gölü, where the main flora was composed of the species of *Juncus*, *B. maritimus*, *Phragmites* and *Typha*, saline and wet soil type did not permit villagers to adopt a productive agricultural economy. In these villages, this case was still apparent from the low population in 1998. Having suffered from the shortage of cereals, these villages used

*Juncus* stems in constructing roofs. They spread the stems parallel to each other on the roof. On the other hand, the villages on the plain with plenty of cereal products could use cereal straw for roofing and in the mudbrick. They owned larger agricultural lands to use by-products such as chaff both to use as building material and for livestock grazing. The wetland zone villages prioritized animal graze on the harvested fields. There were reasons why *Juncus* sp. was not used on the floor under the carpets. First of all, the stems of this plant were hard even when they were fresh. Instead, in Dedemoğlu village the house floors were covered with *B. maritimus* (bafra) stems placed parallel to each other. Carpet was laid on the stem covered floor. The villages such as Adakale with availability to the abundant club-rush resources used club-rush stems in several ways including plaiting mats for roofs and floors<sup>4</sup> (Fig 4). This way, carpets are protected from getting dirty. Floors are protected as well and they do not need to be plastered too often. It also saves time and energy. This material makes the floor softer, because people also sit and sleep on the floor.

The fact that floors of the Neolithic levels of Çatalhöyük are generally clean from plant remains, lithics, and animal bones may suggest that mats laid on floors helped to keep house floors clean. A direct use of club-rush stems was detected through phytolith analysis. Some baskets, possibly used in cooking wheat or barley grains and maybe acorns, were made from stems of *Scirpus* sp. (Rosen 2005) *Scirpus maritimus* was the previous name for club-rush, as the species of *Scirpus* and *Bolboschoenus maritimus* show very similar taxonomical characteristics, except that the latter includes bulbs. Therefore, it has not been determined yet whether the species detected as a result of phytolith analysis is *Scirpus* sp. or *Bolboschoenus maritimus*. Phytolith analysis showed that at least one of the bins sampled contained matting made from club-rush.<sup>5</sup> Matting was used to extra-line the bin and the wheat grains that were stored for replantation were preserved in a bet-

ter quality from mildew and predation by rodents (Rosen 2005). Mat impressions were also found on floors (Fig 5). Phytolith analysis undertaken on the floors also revealed that the floors included club-rush remains, and that covering floors with mats made from club-rush stems is possible according to the results of this analysis (Rosen 2005).

Hillman argued the possibility of club-rush tubers and nutlets as edible food resource that were recovered from the Epipaleolithic site Abu Hureyra (11,000-7000 BC) (Hillman 2000). According to his interpretation, club-rush would only have been collected for its tubers and nutlets because its stems would have been too short to be worth using for thatching when reeds were clearly available. On the contrary, species of *Juncus* stems which are even shorter than club-rush stems are used on the roofs but in a rather different style than simply thatching or loose roof covering. The stems of *Juncus* were placed on the roofs and sealed with mudbrick. It was called 'karaörtü' (black cover). In stem using activities, flowering parts were separated and left off site during harvesting. Later on, livestock was allowed to graze on them. Tubers were not collected for consumption during these activities because most of the tubers are starchy and hard during the club-rush stem collecting season that would be in late summer, overlapping with cereal harvest. Club-rush stems were piled as in the way of cereals. From far, they can be mistaken for wheat or barley grass piles. Metal sickles were used in harvesting club-rush stems as in the case for wild grasses. 'Reed hook' was mentioned as a standard harvesting tool by Hillman (Hillman 2000). He observed reed harvesting in Adakale as well in 1970's.<sup>6</sup> At Çatalhöyük, eight pairs of wild goat horncores placed on the lentil bin were recovered and interpreted as having a symbolic meaning (Hodder 2005). These horns might have been used as sickles for reaping reeds, sedges and cereals. The idea overlaps with the evidence from the SEM analysis of the obsidian bladelets recovered from the same levels. Traces



of club rush were detected from these bladelets. Some wood and pieces of club-rush tubers recovered in large quantities alongside with a cluster of obsidian debitage from the ashy spread related to oven may indicate club-rush harvesting using sickles. (Fairbairn et al. 2005) The same tool type was recovered from the archaeological contexts of Erbaba, Hacilar, Kuruçay and Suberde in the Lake District.<sup>7</sup> The sickles made from horns as interpreted by Melaart and Helbaek (Helbaek 1970) as well and found at Hacilar and Kuruçay are almost identical with each other. In these settlements of Lake District and at Çatalhöyük, the stems of club-rush might have been used in roof construction.

All the villages by the areas with club-rush used parts of the plant, such as stems and tubers, in constructing their houses; because the mudbrick they made from the soil in their area included club-rush tubers and stems. Using club-rush stems saved from cereal straw which is valuable as animal fodder. Club-rush grew in village surroundings without demanding any special care, unlike cereals. Mudbrick was cut from the damp soil in spring, the season when the club-rush tubers developed. Villagers preferred cutting mudbricks from the soil rich in club-rush tubers for building their garden walls,<sup>8</sup> as they are said to add strength to the structure. Many times club-rush stems were used on the top of garden walls and on roofs. At Çatalhöyük Neolithic site walls of the houses, considered as garden walls, made from mudbrick also included tubers of club-rush.<sup>9</sup> Similarly to those of modern villages in the region, interior walls of the houses were thinner and smoother than garden walls. Discarded tubers were thrown into oven fire alongside the fragments of deteriorated mudbrick both for getting rid of the rubbish and as tinder, resulting in their accidental charring. Ovens were cleaned everyday regularly due to accumulated ash after each burning activity. Charred tubers alongside with ash including other accidentally charred plant parts would end up first in the house garbage in a corner of the

garden and finally in the common garbage area of the village. Tubers of club-rush were also recovered, though in low numbers, from Neolithic and Early Chalcolithic deposits of Erbaba, Aşıklıhöyük and Hacilar in Central Anatolia (Van Zeist, De Roller 1995; Helbaek 1970; Van Zeist, Buitenhuis 1983). Suberde with possible access to club-rush and other sedge and reed species nearby the settlement could have made a good comparison to other sites located in marshlands, but it was not sampled at all.

## 2. Fuel

Club-rush stems were often used as fuel too. Livestock also fed on the flowering parts of the club rush. Seasonally piled dung of livestock made a good fuel resource since these wetland zones were relatively far away from the dense woodlands. In the ovens inside and outside of the houses, thousands of club-rush nutlets would get charred alongside with other wild grass seeds through dung burning. All these ended up in the common garbage area. At Çatalhöyük, wheat husk, *Phragmites* and club-rush phytoliths were found mixed near the oven and were interpreted as the remains of fuel (Rosen 2005). In modern villages, garbage dumping in the reed and sedge communities occurred most often. These plants helped to hide the dirt of the garbage and somehow covered it. It was useful to dump garbage in these areas also, for later on these areas could be burnt for garbage cleaning. During this burning activity, again thousands of club-rush nutlets would get accidentally charred mixing in the garbage deposit. At Neolithic levels of Çatalhöyük, club-rush nutlets were sometimes found together with chaff and cereal grains, *Astragalus/Trigonella* and Gramineae seeds, in a few cases seeds of *Rumex*, *Stachys*, and *Alyssum* too, and remains of dung (Fairbairn et al., 2005) These seeds are mature in late summer. It might have been the case that, seed and chaff mixture ended up in dung following a late

summer grazing. In Anatolia, livestock often grazed on harvested fields as indicated above. As well as being nutritious, remains of harvested cereals also help to produce dung as fuel in good quality. Such mixtures of plants from dry and wet land zones might point to dry patches of lands nearby the settlement area too. Neogene terraces 10-12 km far from the settlement area were already suggested as dry land zones used as agricultural lands. (Fairbairn et. al. 2005)

Tubers recovered in large amounts from the archaeological contexts of Çatalhöyük were often addressed to their use as fuel. However, Konya and Karaman villagers do not collect tubers for fuel. Tuber collecting for the purpose of fuel is time wasting, and reaping the stems for fuel is more efficient. Although mud with tubers is collected from the ground to be used as building material, tubers are not picked from the soil. The deteriorated tubers thrown in the oven fire are limited to few. Only some portion of the tubers happened to be charred may have come from the discarded building material. Already, dumping some burnt fragments of building walls in the midden has been apparent in the floated samples of Çatalhöyük.<sup>10</sup> Therefore, large amounts of tubers recovered archaeologically are possibly associated with their consumption.

Up to this point, club-rush tubers were brought on site within the construction material, club-rush nutlets were accidentally brought on site, club-rush stems were generally incidentally brought on site and all were charred as result of non-food activities. For this reason, the abundance of charred nutlets and tubers of this plant present in the middens in a settlement in no way indicates that they were eaten. During such activities, numbers of discarded and burnt tubers are not many.

### 3. *B. maritimus* as a Food Plant

In the Konya Basin, there are villages still con-

suming club-rush tubers (Erkal Tsetsekos 2006 ). During fieldworks, it was told by the villagers in the wetland areas that they consumed club-rush tubers in various ways. The plant was often collected during fieldworks of the present author in these areas with the help of the villagers. At the end of the fieldworks, the voucher specimens collected were taken to the Gazi University Herbarium for their botanical identification. Local people would uproot the plant with its tubers and sometimes collect the tubers in early spring when the tubers were young and juicy. Tubers were separated from their stems, and their muddy outer layer was peeled off at the harvesting place. Often people of all ages, but mostly children, young men and women would casually collect club-rush tubers during other activities. Tubers were also stored in storage pits in the gardens. It is possible that decades ago the villagers preferred storing roasted tubers to storing them fresh in order to prevent germinating or being eaten by vermin. Club-rush tubers were often roasted in low temperature in an oven prior to their consumption. During roasting, some tubers would accidentally be burnt and thrown away in the oven fire.

It is possible that in the early periods tubers of club rush were often roasted prior to their storage. At Çatalhöyük, although *B. maritimus* tubers were largely recovered from the midden deposits as well, the midden contexts were considered to be unreliable resources for the assumption of food consumption. In addition, the abundant recovery of *B. maritimus* tubers from fire installations including fire-pits and oven/hearth (Fairbairn et. al. 2005) where roasting food plants took place and from pits and bins (Helbaek 1970) where food plants were stored, has suggested that tubers were roasted prior to their consumption, and they might have been roasted before stored as well. Hearths and rake-outs typically included pieces of *B. maritimus* tubers alongside with the mixture of domesticated cereal and pulse, wood and wild seed (Fairbairn et. al. 2005).

Today, the consumption of club-rush tubers as a side dish with the 'kavurga' meal made from roasted or boiled wheat grain in wetland zones is a variety of the similar food prepared with kavurga and roasted or boiled acorns in the forest zones. It serves the same purpose that wild food plants were added in cereal meal both to make the meal nutritious and to increase the food amount. In the 1999 summer season, experimental work was undertaken in collaboration with Michele Wollestonecroft to test the consumption possibilities of club-rush tubers (Erkal, 1999; Wollstonecroft, Erkal, 1999). Unfortunately, it was soon discovered that summer was the wrong season to test their harvesting, processing and edibility. Uprooting the plant with its tubers required time and energy, so three people could collect around half a kilo of tubers in one hour. Although pounding tubers into flour took a long time as well, flour-making from the tubers was possible.

#### TRADE, LANGUAGE AND KINSHIP AS TOOLS OF ACCULTURATION

The local names of club rush changed according to differences in the environmental zone as well as in the main uses of the plant. Club rush was called 'kovalık'<sup>11</sup> by the villages near Hotamış Lake. In these villages club rush stems were used for basketmaking. In mountain villages, the plant took the name of 'koyalak', because the villagers knew the stems of this plant through trade. All sedge species were called 'koyalak' (meaning: repellent) by the mountain villagers. During meat cooking activities in the open air, burnt sedges in the cooking fire produce a dark smoke that works as an insect repellent. In Madenşehir located in the forest of Karadağ, the club rush was also called 'berde' (berde cushions were made from club rush stems) meaning 'from the flooded lands'. Suberde took its name from the same origin as well. In the northern steppe villages still holding their availability to reed and sedge resources, the club rush was called 'bafra', taking its name from the cushion made with club rush stems.

In the central steppe villages such as Türkmencamili, the plant was called 'kindıra', meaning tinder because sedge species such as *Juncus* growing in the now arid zone are used as tinder. Although there is an exchange network between the steppe and mountain zones, the central steppe villages are not in close affiliation with the mountainous villages in terms of acculturation through kinship and share of workpower. It reflects on the language as different names for the materials used by the local people. On the other hand, the wetland zone villages often exchange materials with the ones in the mountainous zone. The villages on the skirts of the mountains hold availability for a steppic and fertile environment; therefore they are often in rival with the mountainous villages.

The reflection of the changing environmental conditions on the language can be observed in Güneysınır (the village name means 'south border' pointing to the southern forest border to the Konya Plain). The village used to be surrounded by dense woodlands a few decades ago but today, due to deforestation, the area is now being part of the expanding steppe zone. Before deforestation, club rush was called 'koyalak' as in the mountainous area villages. When the arboreal vegetation started to be replaced by steppic environmental type, the club rush changed the name from 'koyalak' to 'kindıra' as in the steppe zone villages.

#### CONCLUSION

Given all the ethnographic account and given the archaeological evidence, the inhabitants lived in the Neolithic and Chalcolithic periods in the settlements within the scope of this research used club-rush in various activities if the plant was locally abundant (Fig. 6). According to geomorphological research, the marshlands of the Konya Plain where Çatalhöyük was located were probably dominated by the sedges and reeds including club-rush, and grasslands. This case is apparent also from the construction of the mudbrick houses.

This type of ethnobotanical study in understanding the roles of the wild food plants in early agricultural societies by using ethnobotanical research<sup>12</sup> revealed many important results for the interpretation of the archaeobotanical recovery from the Neolithic and Chalcolithic sites. By-products, plant parts brought on site, possibilities of off site consumption studied through ethnobotanical research strategies also shed light to how different processing techniques affected the survival of the various parts of the plant. It was also important to stress that as well as environmental circumstances, cultural factors played a role in the diet and the techniques used in processing plants. The most difficult plants to talk about were wild almonds and club-rush tubers; the former for its bitter taste and the latter for being gathered from the muddy water outside the domestic area. During the study it was observed that local people living in the area did not want to talk about consuming wild food plants, especially the ones rejected for their bitter tastes by people with better economic conditions. Tannin removing processes, storage activities and real quantities of the collected and consumed plants were found out only after several trips to the villages. The consumption of a bitter tasting fruit (in spite of them being processed) was related with poverty. Although mud was good for constructing buildings, it meant dirt in the wild especially to the villagers who lived in the steppes. As a result, *B. maritimus* tubers first said to be of no use by the Süleymanhacı villagers were later found to be used in three different ways alongside their consumption, and according to the muhtar and the residents of the village, the trade network including *B. maritimus* dates back to 1500's in the same village when it was first settled (Erkal Tsetsekos 2006).

Other questions related to the role of the wild food plants in agricultural societies: To what

degree the local people in modern villages situated in different environmental zones of the Konya Basin consume wild food plants was tested. Finally, there was the question of how far it was possible to compare present day environments and sociocultural patterns with the conditions predominating in the Neolithic. Paleoecological investigations and the vegetation surveys of the current environment could help estimate how far the wild fruit, nut and tuber resources were from the Neolithic settlements. Changes are occurring all the time, and making a detailed analogy was not possible. None the less, these wild food plants including club-rush recovered from the archaeological excavations are being used. It is a very strong similarity to the Neolithic, and harvesting, processing and storage may be similar. These techniques recorded from modern villages produced similar taphonomic results to those recovered from archaeological deposits. It was also supported by the other analysis results on the archaeological remains that this ethnobotanical modelling can be used in interpreting the archaeological remains concerning wild food plants. Researchers from other various disciplines, such as anthropologists, economists, sociologists, pharmacists and food engineers can also benefit from such ethnobotanical studies. This study also showed that due to modernisation, traditional living styles and natural environments which serve as open laboratories to archaeologists become extinct in a fast way. For this reason, it is vital to record the data from these resources before they are lost from our world forever. Environmental worries as well as scientific concerns need to be stressed in every possible chance. It is important that we pay attention to sudden changes in nature manipulated by human. Such changes are threatening to us humans as well as to habitats feeding and sheltering millions of animal and plant species.



## NOTES

<sup>1</sup>Moerman., 1998; Fairbairn, Martinoli, Butler and Hillman, 2007; Ertuğ-Yaraş, 1997 are a few examples to it.

<sup>2</sup>Profs. Hayri Duman, Mecit Vural and Zeki Aytaç of Gazi University Department of Biology identified the voucher specimens as *B. maritimus* (L.) Palla var. *maritimus* collected by the present author during the fieldworks.

W. Matthews et al. 1998

<sup>3</sup>Club-rush is not commonly used in other areas of Turkey for baskets or mats. For further reference, see F. Ertuğ, 1999; F. Ertuğ, 2006. Plants used in domestic handicrafts in Central Turkey and: An overview of the plaited crafts of Turkey (Anatolia and Thrace) in Proceedings of ICEB, IV International Congress of Ethnobotany (ICEB), Istanbul, August 21 – 26, 2005, published in the Proceedings of the ICEB 2005 (Ed. Fusun Ertuğ), November 2006.

<sup>4</sup> Such uses of the plant also indicate the diversity, as in Aksaray and Kayseri areas local people only use reeds, *Phragmites* for roof mats as they are larger when cut to open and long, easy to plait and sturdy, as well as shiny. See Ertuğ-Yaraş, 1997.

<sup>5</sup>However, according to Wendrich, exact identification of phytolith remains is extremely difficult, but the identifications given for various coiled basketry were *Cyperus* species, wild panicoid grass leaves,

*Agropyron* inflorescence and stem as well as cereal straw. See Wendrich 2005.

<sup>6</sup>Hillman pers. comm.

<sup>7</sup>Esin states the finds of horn tools at Aşıklıhöyük, but she relates these tools with hunting activities and processing of skins and hides, 1998.

<sup>8</sup>A similar observation was also made by Yalman in her PhD thesis, for different villages of the Konya Basin. These villages were located on a steppe environment that lacked club-rush and the villagers used soils rich with ayrık otu (possibly *Elymus* or *Agropyron*) in preparation of mudbrick. See Yalman, 2004.

<sup>9</sup>Çatalhöyük Archive Reports by BACH Team, 2000-2001.

<sup>10</sup>Erkal Tsetsekos pers. observation, 1999

<sup>11</sup>In general *Juncus* sp. and sometimes *Carex* sp. are also called as 'koyalık' in various parts of Anatolia (Ertuğ pers. comm.). To avoid confusion, during the fieldworks for this study voucher specimens were collected for each differently named plant by the villagers, and botanically identified at the Gazi University Herbarium.

<sup>12</sup>Ertuğ recorded over 100 wild plants for food use during her ethnobotanical research at Kızılkaya village in Aksaray near Aşıklıhöyük. See Ertuğ 1997.

## REFERENCES

- DAVIS, P.H., (Ed.) (1965-1985).  
*Flora of Turkey and the East Aegean Islands*. vol. 1-9. Edinburgh, Edinburgh University Press.
- ERKAL A., 1999.  
"Experimental Work at Çatalhöyük", *Çatalhöyük 1999 Archive report*. Online at www.catalhoyuk.com
- ERKAL TSETSEKOS, A., 2006.  
*The Ethnobotany of Wild Plant Food Use in the Konya Basin: A Quantitative and Ethnoarchaeological Approach*, MSc thesis submitted to the Graduate School of Natural and Applied Sciences of Middle East Technical University, Ankara.
- ERTUĞ-YARAŞ, F., 1997.  
*An ethnoarchaeological study of subsistence and plant gathering in Central Anatolia*, PhD dissertation, St. Louis, Washington University,
- ERTUĞ F.,  
1999. "Plants used in domestic handicrafts in Central Turkey", *OT Sistematik Botanik Dergisi* 6/2, 57-68
- 2006 "An overview of the plaited crafts of Turkey (Anatolia and Thrace)" in *IV International Congress of Ethnobotany (ICEB), Istanbul, August 21 – 26, 2005*, (Eds.) D. NOVELLINO, F. ERTUĞ published in the *Proceedings of the ICEB 2005 (Ed. Z. Fusun Ertuğ)*, November 2006, Istanbul, Ege Yayınları.
- ESİN U., 1998.  
"Hunted Animals at Aşıklı and the environment", *Man and the Animal World: studies in archaeozoology, archaeology, anthropology and paleolinguistics-in memoriam Sandor Bökönyi*, (Eds.) P. ANREITER, L. BARTOSIEWICZ, E. JEREM, W. MEID Budapest, Archaeolingua, 215-226.
- FAIRBAIRN, A., J. NEAR, D. MARTINOLI, 2005.  
"Macrobotanical investigations of the North, South and KOPAL areas at Çatalhöyük", *Inhabiting Çatalhöyük: Reports from the 1995-1999 seasons*, (Ed.) I. HODDER, McDonald Institute for Archaeological Research/BIAA, 137 – 20.
- FAIRBAIRN, A., D. MARTINOLI, A. BUTLER, G. HILLMAN, 2007.  
"Wild plant seed storage at Neolithic Çatalhöyük East, Turkey", *Veget. History and Archaeobotany*. 16/ 6, 467-479.
- HELBAEK H., 1970.  
"The plant husbandry of Hacilar", *Excavations at Hacilar*. I, (Ed) J. MELLAART, Edinburgh, 189-244.
- HILLMAN G. C., 2000.  
"The plant food economy of Abu Hureyra I and II", *Village on the Euphrates: From foraging to farming at Abu Hureyra*, (Eds.) A.M.T MOORE, G.C HILLMAN, A. J. LEGGE, Madison / New York, Oxford University Press, 327-422.
- HILLMAN G. C., S. M. COLLEDGE, D. R. HARRIS, 1989.  
"Plant food economy during the Epipaleolithic at Tell Abu Hureyra, Syria", *Foraging and Farming*, (Eds.) G.C HILLMAN, D.R.HARRIS, London, Unwin Hyman, 241-68.
- HILLMAN G. C., E. MADEYSKA, J. G. HATHER, 1989.  
"Wild plant foods and diet at Late Paleolithic Wadi Kubbania: the evidence from charred remains", *The Prehistory of Wadi Kubbania 2: Palaeoeconomy, Environment and Stratigraphy*, (Ed.) F. WENDORF, R. SCHILD, A. CLOSE, Dallas, Southern Methodist University Press, 162-242.
- HODDER I., 2005.  
"Introduction", *Inhabiting Çatalhöyük. Project Members Excavations at Çatalhöyük 1995-1999*, (Ed) I. HODDER, BIAA and McDonald Institute for Archaeological Research.
- KANTRUD, H. A., 1996  
*The Alkali (Scirpus maritimus L.) and Saltmarsh (S. Robustus Pursh) Bulrushes: A Literature Review*, Virginia/ Springfield, U.S. Department of the Interior Information and Technology Report 6.
- MATTHEWS W., C. HASTORF, B. ERGENEKON, 1998.  
"Ethnoarchaeology", *Towards reflexive method in archaeology*, (Ed) I. HODDER, BIAA Monograph 28.
- MOERMAN D. E., 1998.  
*Native American Ethnobotany*. Timber Press, Inc.
- ÖZDOĞAN M., N. BAŞGELEN, 1999.  
*Neolithic in Turkey*, İstanbul, Arkeoloji ve Sanat Yay.
- ROSEN A., 2005.  
"Phytolith Indicators of plant and land use at Çatalhöyük", *Inhabiting Çatalhöyük. Project Members Excavations at*



*Fig 4: Roof matting using *B. maritimus* stems. In the Konya Basin today, village women flatten and weave the stems of sea club-rush into matting that is used to cover the ceiling in some rooms (Adakale nearby Hotamış Sazlığı).*



*Fig 5: A mat impression from Çayönü Neolithic site, Diyarbakır (Özdoğan And Başgelen 1999: 29).*



*Fig 6: A similar sea club-rush matting is also placed between the wool carpets and the floors in houses.*