

# Plant remains from a Funnel Beaker Culture site at Niedźwiedź, Słomniki commune, Małopolska province

BARBARA BURCHARD and MARIA LITYŃSKA-ZAJĄC

Institute of Archaeology and Ethnology, Cracow Branch, Polish Academy of Sciences, Sławkowska 17, 31-016 Kraków, Poland; e-mail: maria@archaeo.pan.krakow.pl

Received 28 February 2002; accepted for publication 30 October 2002

**ABSTRACT.** Archaeological research at Niedźwiedź (site 1) was carried out in the years 1965–73. An area exposed during excavations revealed 60 pits of the Neolithic settlement of the Funnel Beaker Culture. Plant remains were preserved in the form of imprints in daub, charred diaspores and charcoal pieces. Most abundant remnants belonged to emmer wheat *Triticum turgidum* L. subsp. *dicoccon* (Schrank) Thell and einkorn wheat *Triticum monococcum* L. subsp. *monococcum*. The other cereals were imprints of caryopses of common barley *Hordeum vulgare* L. Few remains of wild plants were found in the daub. Anthracological analysis indicated that charcoal was dominated by the remains of oak *Quercus* sp.

**KEY WORDS:** archaeobotany, Funnel Beaker Culture, Niedźwiedź, Poland

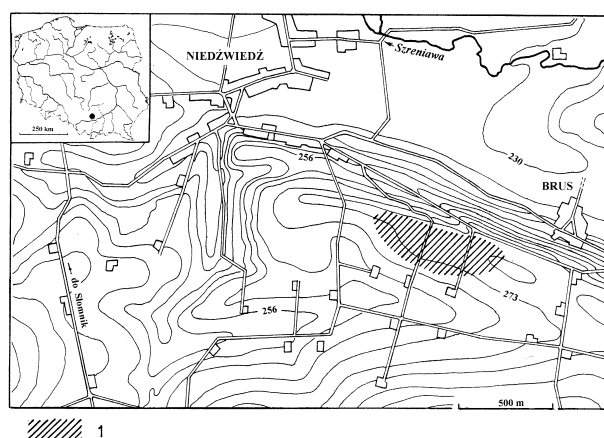
A Neolithic site of Funnel Beaker Culture at Niedźwiedź is situated in the southern part of Miechów Upland. The area has been comprehensively described in respect of its natural environment. For the research into the reconstruction of prehistoric settlement, the following have the basic significance: characteristics of the sculpture of the earth's surface, the soil cover, the river network and the vegetation. Miechów Upland is covered with numerous patches of loess, on which the following loess-derived soils appear: tchernozems, brown soils, and rendzinas. The area is rich in springs and comprises catchment-areas of the Dłubnia and the central Szreniawa rivers. The Funnel Beaker Culture community arriving in the area of loess uplands, most probably from low-lying localities, found the landscape of varied topography, and full of water springs as well as fertile soils.

The site at Niedźwiedź (20°06'33" E; 50°13'12" N) is situated on a flattened top of an upland, at an altitude 280 m, which is a

part of the right edge of the Szreniawa valley. The northern slope of the upland steeply falls towards the river valley (the amplitude of level is about 50 metres), the southern one mildly descends towards a shallow valley separating the hill from the height. To the west, the upland is divided by a saddle-like depression, and is ended with a promontory with a highly eroded, thin soil cover – chalk fertile soils, now it is a barren land. The eastern highest part is covered with brown soil formed from loess, and is at present taken up by cultivation. Complexes, which make up potential natural vegetation in the area of the site at Niedźwiedź are mainly oak-hornbeam forests, where there is a domination of drier oak-hornbeam forests *Tilio-Carpinetum typicum* and wetter oak-hornbeam forests *Tilio-Carpinetum stachyetosum*, which occupy a smaller area. Complexes of riverine forests, which appear locally in the narrow valley of the Szreniawa, are much more limited (Medwecka-Kornaś et al. 1979).

The Funnel Beaker Culture site spreads in

the eastern part of the hill and on its mild southern slope (Fig. 1). It represents characteristic of the Funnel Beaker Culture type of upland settlement. The fact that community members of this culture gave preference to upper zones of the landscape for settlement on loess areas, is connected with applying such farming techniques, for which the most convenient environment were areas of dry forest complexes covering large surfaces of the top parts of uplands and inter-valley areas (Kruk & Milisauskas 1999).



**Fig. 1.** Location of the site 1 of Funnel Beaker Culture at Niedźwiedź, 1 – settlement

Archaeological research at Niedźwiedź (site 1) was carried out in the years 1965–1973 (Burchard 1977). From estimated at approximately 4 hectares area of the settlement, 4300 m<sup>2</sup> were examined in excavation. On the area about 60 features were recovered, which had the character of pits belonging to Funnel Beaker Culture, also one feature connected with an older settlement developing on the area, and representing Malicka Group, as well as, connected with a later settlement from the close of the Neolithic Age, two graves of Corded Ware Culture, and six pits of Trzciniec Culture from the beginning of the Bronze Age. Most of the recovered pits were 200–300 cm deep from the surface, which indicates that the top of the hill only slightly underwent erosion.

From charcoal samples taken from the Funnel Beaker Culture features, four radio-carbon dates were obtained: 2520±190 M-2321; 2650±190 M-2322; 2690±190 M-2323; 2765±100 Bln-927 conv. BC (Burchard 1973). Comparing this series of dating with analo-

gous results from a Funnel Beaker Culture site in Bronocice, Działoszyce commune, one may state that it fits in the range corresponding to chronological horizon defined as Bronocice III. It finds confirmation in considerable convergence of archaeological indexes – typological-stylistic and technological.

At the site under research at Niedźwiedź, plant remains were preserved in the form of imprints in daub, burnt diaspores and charcoal. The article presents new results of botanical research comprising the latest results of analyses of samples (imprints on daub, soil samples, charcoal) supplemented with published data. The latter comprise identification of some part of charcoal from field research from 1972 (Gluzza et al. 1988, Wasylikowa et al. 1992), and a part of results of daub research, carried out until 1992 (Lityńska-Zajac 1997).

The daub supplied for research, which came from on-ground constructions of exposed features, was generally well baked, and fragile; it contained plentiful plant material. Plant remains were preserved in the form of imprints, as well as burnt and turned into ashes (dried) fragments of tissues. They were disorderly arranged in clay, usually inside lumps. The burnt specimens were generally smaller, contracted in relation to the imprint in which they were stuck. The daub permeation with plant remnants was uneven. In most lumps there were numerous specimens, which formed accumulations making counting difficult. In others, especially those with a coarse-grained mineral admixture (sand), there were no clear imprints, which could be unambiguously classified as plant remains.

Analysed soil samples, collected during the exploration of in-ground features, did not bring satisfactory results. Only single, charred specimens of cereals were found, which came from the time when the settlement was used.

Charcoal was a numerous group of plant remains. Most wood fragments fitted in the size class from 1 to 2 cm. Smaller specimens, with the longest dimension below 0.3 cm remained not undetermined.

The first position as regards the number of cereals identified to the level of species, was taken by emmer wheat *Triticum turgidum* L. subsp. *dicoccon* (Schrank) Thell. It was preserved in the form of imprints of the whole spikelets, as well as their fragments, imprints

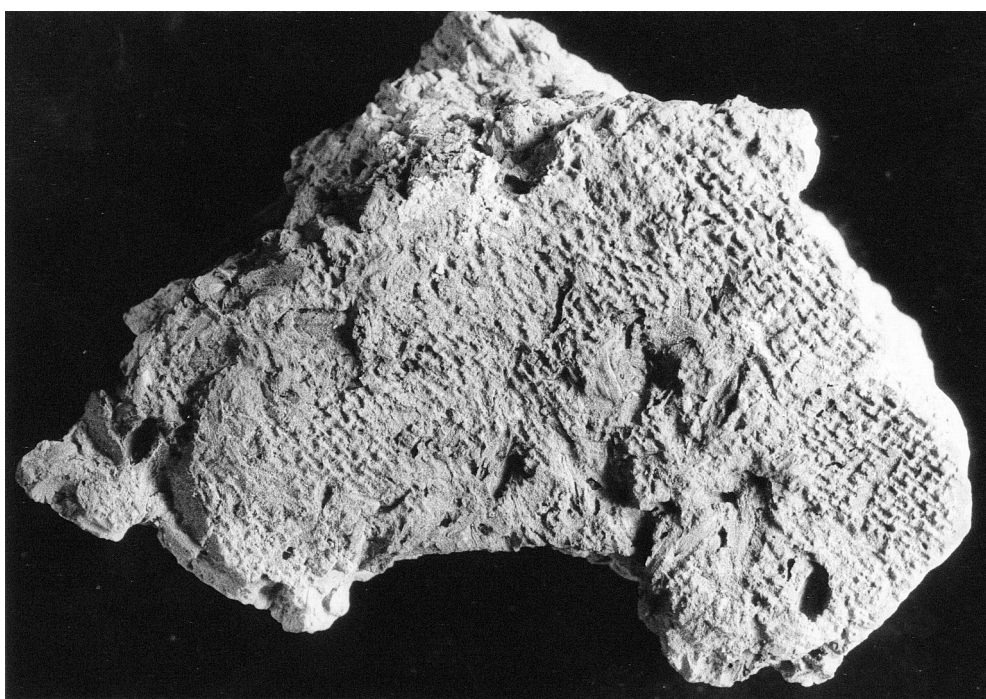


**Table 2.** Impressions of seeds or fruits of wild plants from the Funnel Beaker Culture site at Niedźwiedz; **sp** –spikelet, \* – charred remain preserved inside the imprint

Taxa names \ Pit No.	12	29	62	68	75	76	78	79	81	83	84	89
<i>Agrostemma githago</i>	1, 1*	0	0	0	0	0	0	0	0	0	5, 2*	3
<i>Bromus hordaceus</i>	0	0	0	0	0	1*	0	0	0	0	0	0
<i>B. secalinus</i>	0	0	0	0	0	1, 1*	1*	0	0	1*	1*	0
<i>Bromus</i> sp.	0	2*	0	1*	1	0	2	0	2	1	12, 14*	1*
Caryophyllaceae	0	0	0	0	0	0	0	0	0	0	3	0
<i>Chenopodium</i> sp.	0	0	0	0	0	0	1*	0	0	0	0	0
<i>Dicotyledones</i>	0	0	0	0	0	1	0	1	0	0	0	0
<i>Geranium</i> sp.	0	0	0	0	0	0	0	0	0	0	0	1*
<i>Polygonum</i> sp.	0	0	0	0	0	0	0	0	0	0	1	0
<i>Sambucus</i> sp.	0	0	1*	1*	0	0	0	0	0	0	1, 1*	0
<i>Setaria</i> sp.	0	0	0	0	0	0	1sp	0	0	0	2	0

of chaff, or burnt bigger fragments of straw, reaching even 7 cm in length. Many specimens were classified only as representing cereals or grasses. On some fragments of daub, rather

of daub. Especially interesting was the fact of finding imprints of fragments of fabric, in feature number 84, which is being worked out at present (Fig. 2).



**Fig. 2.** Imprint of a fabric found in the site of Funnel Beaker Culture at Niedźwiedz, (natural size)

unclear and incomplete outlines of leaf blades of dicotyledonous plants were found.

Apart from identifiable plant imprints, the daub had some traces of the so-called construction elements, preserved in the form of imprints of branches. In some cases, fragments of oak charcoal were stuck in them. They appeared mainly on the surface of single lumps

Anthracological research indicates (Tab. 3) that in charcoal there was a domination of remains of oak *Quercus* sp. (over 90%), with a small number of remains of linden *Tilia* sp., maple *Acer* sp., hazel *Corylus avellana*, Scots pine *Pinus sylvestris*, alder *Alnus* sp., and poplar *Populus* sp. The charcoal was found dispersed in the archaeological features.

**Table 3.** Charcoal from the Funnel Beaker Culture site at Niedźwiedz

Taxa names Pit No.	<i>Acer</i> sp.	<i>Alnus</i> sp.	<i>Corylus avellana</i>	<i>Pinus sylvestris</i>	<i>Populus</i> sp.	<i>Quercus</i> sp.	<i>Tilia</i> sp.
12	0	0	0	1	0	0	0
14	0	0	0	0	0	2	0
61	0	1	0	0	0	37	0
62	0	0	0	0	0	19	0
62a	0	0	0	0	0	3	0
68	1	0	0	0	0	18	0
70	0	0	0	0	0	2	0
71	0	0	0	2	0	115	3
75	1	0	6	0	0	300	0
80	0	0	0	0	0	235	0
83	0	0	0	0	1	49	0
84	10	0	0	0	0	151	19
101	0	0	0	0	0	1	0
108	0	0	0	9	0	76	15
116	0	0	0	1	0	2	0

Joint archaeological and botanical study allowed for a broader insight into the question of ancient agriculture. On one hand it enabled to determine the plants which were cultivated and used by man, and on the other hand it made it possible to obtain precise dating, and to state archaeological context for the botanical observation.

From the site at Niedźwiedz, a big number of lumps of daub from the Funnel Beaker Culture features were analysed. The whole material indicates that most often, both in daub and in soil samples, there were traces of hulled wheats, first of all emmer wheat, and, in a smaller number of specimens, einkorn wheat. There was a slightly smaller proportion of common barley. This corresponds to the results of research into plant material from other archaeological sites belonging to Funnel Beaker Culture from Western Małopolska Loess Upland (Lityńska-Zajac 1997). Hulled wheats and barley were the main cereal species cultivated in this region. Co-occurrence of remains of emmer and einkorn wheat in subfossil material, in single samples at many archaeological sites of the area under research, allows to assume that these both species were sown together, but the former must have had a dominant character in cultivation. Emmer and einkorn wheat have similar edaphic requirements and similar development cycle, which allows them to grow on one field in a mixture. Most probably, fields where

barley was cultivated were set up separately. Cultivation must have taken place on the upland areas. It cannot be excluded, however, that some fields were situated in the valley. Wheat was most probably cultivated in both dry and a little damp habitat, while barley rather in drier one.

In the researched samples there were relatively a lot of, as for finds in daub, wild herbaceous plants. The presence of corn cockle seeds indicates that it appeared on cereal fields as a weed. Remains of grasses – brome-grass, and bristle-grass – indicate that they could also have weeded the cereal fields. It cannot be excluded, however, that the grasses with big, floury caryopses, were used by man as a supplementary source of food (Gluza 1984).

Plentiful plant admixture in daub indicates that plants were added (remains of threshing), to construction clay as temper.

Taxonomic composition of trees shows that, first of all, forests growing on the habitats of high or low hornbeam forest were economically exploited. To a much smaller extent, wood for various uses was also obtained from riverine forests, which is proved by scant remains of alder and poplar.

In the material under research, as mentioned above, remains of *Quercus* sp. dominate. Unquestionable domination of the oak reflects a clear preference of this species and its selective cutting by man of the time. It also results from a big accessibility of the species in

primaeval forests. Comparing taxonomic composition of charcoal at two sites of Funnel Beaker Culture at Niedźwiedź and at Bronocice, one may state that at the former there were mostly remains of oak, and at the latter of Scots pine. The pine only slightly marked its presence in Niedźwiedź. Chronological division of material from Bronocice shows that in the older phases of settlement, oak had a greater significance, and its share in anthracological spectra decreased in later periods (Wasylikowa et al. 1992). At the site at Niedźwiedź, older settlement, preceding the development of Funnel Beaker Culture community, is weakly represented in archaeological material. Thus, it is appropriate to assume, in high probability, that people of Funnel Beaker Culture exploited primaeval forests, choosing the most precious for economic use kind of wood.

Pieces of *Quercus* sp. charcoal found in clay suggest that oak was the main species used for construction. It must have also been used, similarly to other species, as fuel material.

#### REFERENCES

- BURCHARD B. 1973. Ze studiów nad chronologią kultury pucharów lejkowatych w zachodniej części Małopolski. *Prace Komisji Archeologicznej Oddziału PAN w Krakowie*, 12: 107–119. (in Polish).
- BURCHARD B. 1977. Wyniki badań wykopaliskowych na osadzie kultury pucharów lejkowatych na stan. 1 w Niedźwiedziu, gm. Słomniki, woj. Kraków, w latach 1965–1973 (Zusammenfassung: Aus den Studien über die Chronologie der Trichterbecher-Kultur im Westlichen Teil Kleinpolens). *Sprawozdania Archeologiczne*, 29: 59–81.
- GLUZA I. 1984. Neolithic Cereals and Weeds from the Locality of the Lengyel Culture at Nowa Huta-Mogila near Cracow. *Acta Palaeobot.*, 23(2): 123–184.
- GLUZA I., TOMCZYŃSKA Z. & WASYLIKOWA K. 1988. Uwagi o użytkowaniu drewna w neolicie na podstawie analizy węgla drzewnych ze stanowisk archeologicznych w Krakowie-Nowej Hucie (summary: Remarks on the use of wood in the Neolithic based on the analysis of charcoals from archaeological sites in Kraków-Nowa Huta). *Materiały Archeologiczne Nowej Huty*, 12: 7–25.
- KRUK J. & MILISAUSKAS S. 1999. Rozkwit i upadek społeczeństw rolniczych neolitu (Abbreviated English Version: The Rise and Fall of Neolithic Societies). Instytut Archeologii i Etnologii, Kraków.
- LITYŃSKA-ZAJĄC M. 1997. Środowisko i uprawa roślin w czasach pra- i wczesnohistorycznych (summary: Environment and Plant Cultivation in the Prehistoric and Early Historic Times): 473–497. In: Tunia K. (ed.) *Z archeologii Małopolski. Historia i stan badań zachodniomałopolskiej wyżyny lessowej*. (Archaeology of Małopolska. Historical Overview and Current Research of the Loess Uplands of Western Małopolska). Polish Academy of Sciences, Kraków Branch, Institute of Archaeology and Ethnology.
- LITYŃSKA-ZAJĄC M. & BIENIEK A. 1998. Archaeobotanical sites from the Western Małopolska Upland: 24–28. In: Wasylikowa K. (ed.) *Holocene – Prehistoric settlement and its environmental setting east of Cracow. Guide to excursion 4. The 5<sup>th</sup> European Palaeobotanical and Palynological Conference, June 26–30, 1998, Cracow, Poland*. W. Szafer Institute of Botany, Polish Academy of Sciences, Kraków.
- MEDWECKA-KORNAŚ A., DENISIUK Z. & DZIEWOLSKI J. 1979. Szata roślinna – potencjalna roślinność naturalna. Mapa w skali 1:300000. In: *Atlas miejskiego województwa krakowskiego*. Kraków (Plant Arrangement – Potential Natural Vegetation. A map in scale 1: 300000. In: *Atlas of Cracow Province*).
- TOMCZYŃSKA Z. 1978, unpubl. Wyniki badań węgla drzewnych ze stanowiska 1 w Niedźwiedziu. Archiwum Instytutu Archeologii i Etnologii PAN. Oddział w Krakowie. (Results of research of charcoal from site 1 in Niedźwiedź. Archives of the Institute of Archaeology and Ethnology, Polish Academy of Sciences, Cracow Branch). (in Polish).
- WASYLIKOWA K., GLUZA I., LITYŃSKA-ZAJĄC M. & TOMCZYŃSKA Z. 1992. Charcoals from three Neolithic settlements in the loess area of south-central Poland. *Bull. Soc. Botan. France*, 139: 373–382.