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Plant Identification and Significance in Funeral Traditions Exemplified by Pillow Filling from a Child Crypt Burial in Byszewo (18th/19th centuries)

Abstract

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Plants have always played an important role in funeral customs. To understand their true meaning, close cooperation between the archaeologist and the archaeobotanist is needed, not only during the final interpretation, but from the very beginning, at the stage of collecting materials. In the article, plants' identification, using both pollen and macroremains analysis, was described, based on one of the children's burial from the Holy Trinity Church in Byszewo (18th/19th centuries). The filling of the coffin pillow consisted of numerous hop (*Humulus lupulus*) macroremains, the representation of which was very low in pollen sample. This is due to the fact that only female specimens of hop were inserted into the coffin. To determine the reason for using hops in funeral practices in Byszewo, ethnobotanical data was used. The following research indicates the need for the cooperation between two methods of plant identification. It will allow misinterpretations of botanical findings to be avoided.

Key words: archaeobotany, funeral plants, crypts, child burial, Byszewo, Northern Poland

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Introduction

Archaeological studies are the basis for research on the human socio-cultural past (Ławecka 2019; Bielińska-Majewska 2011). One of its elements is the funeral ritual, which consists of a group of practices and beliefs related to the burial of the dead. Funeral archaeology, based on preserved materials, attempts to reconstruct not only the customs themselves, but also the whole culture, with its rules and restrictions rarely found in written sources (Trawicka, Ceynowa 2010; Czopek 2012). The rituals associated with the burial included the tradition of placing objects into the coffins which accompanied people in their lives, so that they could use them after death, or coins to

cover the fees on the way to the afterlife (Bohdanowicz 1999; Skóra, Kurasiński 2011). An important element of these practices were plants and herbal accessories. Botanical remains in burials are mainly preserved in the form of bouquets and wreaths, as well as mattress and pillow remnants (Rożek 1977; Pela 1997; Galera *et al.* 2013; Hryszko 2013; Noryśkiewicz, Sulkowska-Tuszyńska 2016). Apart from their aesthetic value, flowers and herbs were placed for religious reasons or as a superstition, like the belongings of the deceased, meant to provide food after death or facilitate 'the trip to the other side.' The type and number of plants that were placed in the coffin depended on the season and on the family's wealth. In spring and summer, when gardens, meadows, roadside ditches and fields were

covered with colourful flowers, they were the main decorative element (Drażkowska 2006, 2007). Plants were also put into coffins for purely practical reasons; because of their aseptic properties which slowed down decay or due to their strong fragrance which screened the smell of the decomposing remains (Bohdanowicz 1999; Drażkowska 2005). Bearing in mind such an important role of plants in the ritual of the transition between death and eternal life, it is necessary to cooperate with an archaeologist in order to get a full picture of the ancient funerary rites in each historical period. So far, only a few publications and reports have been created, in which botanical data obtained from various types of burials are discussed in greater detail. This is true of both Poland (e.g. Pińska, Latałowa 2010; Galera *et al.* 2013; Kurasiński *et al.* 2018) and of other countries (e.g. Hansson, Bergström 2002; Korolyuk, Polosmak 2010; Nadel *et al.* 2013; Šálková 2015; Akeret 2016; Lempiäinen-Avcı *et al.* 2017; Wu *et al.* 2017). The purpose of this paper is to present, on the basis of an analysis of the pillow filling from one of the burials in Byszewo, the methods used in archaeobotany and the possibilities of interpretation of botanical findings preserved in coffins.

Historical background and outline of archaeological research in the Holy Trinity Church in Byszewo

Byszewo is a small village situated between the regions of Pomerania and Greater Poland, in the county of Bydgoszcz (Główny Urząd Geodezji i Kartografii 2019). The first certain mention of the place is connected with the arrival of the Cistercian Order in Byszewo in the 13th century and the erection of a wooden church. At the turn of the 15th and 16th centuries, the building was modernised and a brick church stood in place of the wooden structure, which 150 years later was destroyed by a fire. In the middle of the 17th century, a third temple was built on the site – the Holy Trinity church. In the 18th century, the church was extended by means of two side chapels and a porch (Adrich 2016). The church is the Sanctuary of the Blessed Virgin of Byszewo, the Queen of Krajna.

Archaeological work was conducted from November 2017 to April 2018, with the research focus on the southern crypt. More than hundred coffins containing the remains of more than 115 men, women and children were discovered there. Most of the burials date back to the 18th and 19th centuries, although older burials, also from the beginning of the 18th century, cannot be excluded. Archaeological documentation involved

a detailed description of the crypts, location and characteristics of coffins, and an inventory of their adornment, including clothing and movable memorials. It is worth noting that children's coffins were markedly simple, while those of adults were more elaborate both in their making and decoration (Grupa, Nowak 2019). After the research, the human remains, along with the destroyed coffin relics, will be reinterred in the parish cemetery.

Among the studied burials, child burial no. 37/2018 is an exceptional one. The wooden coffin consists of a coffin chest and a lid, both trapezoidal. Lid proportions and dimensions suggest a second chest was used for the purpose. Individual boards were processed with little diligence (visible traces of treatment with a plane) and joined with wooden dowels. Child burials are usually associated with bright colours highlighting the innocence of the deceased (Kizik 2001; Majorek, Grupa 2013; Grupa *et al.* 2014), but this coffin, however, had been painted black. This decoration of child burials is not uncommon at the sanctuary of Byszewo (Grupa, Nowak 2019).

Inside the coffin, the relatively well-preserved remains of the deceased child were found, most likely in the first year of life. The infant was equipped with a shirt or a funeral dress made of linen fabric in a plain weave 1/1, the length of which allowed the bottom edge of the clothing to be placed under his/her feet. The linen fabric underwent far-reaching destruction due to the physicochemical conditions prevailing in the crypt (Drażkowska, Grupa 1998). Decorated appliqué (around the chest, the legs and the cuffs), stitched to the garment with tailoring pins, remained in a decidedly better condition. They were made of silk rep ribbon in a 1/1 rep weave, keeping the insets at the edges. The infant's head was decorated with a funeral wreath made of green plants and fragments of silk bands, identical to those used as appliqué on the grave clothing.

The body of the deceased was laid on the layer of plants and wooden chips, which were probably covered with linen fabric forming the shape of the mattress (Drażkowska 2005; Grupa *et al.* 2014). Near the skull, there was an accumulation of plant parts and small scraps of linen fabric, which indicate the use of these plants as the filling of the coffin pillow. The use of pillows could have both practical and symbolic dimension. An additional element of the coffin adornment strengthened the impression of wealth. The pillow allowed the body to be arranged for the last farewell or presentation before the funeral, giving the impression that the dead person was asleep – one of the allegories of death (Drażkowska 2005). The use of mattresses

and pillows with a herbal filling as an element of coffin lining was quite a common practice (Drażkowska 2005; Matuszewski 2007; Wojcieszak 2010; Grupa *et al.* 2014). They were often made of the same fabric as the mortuary clothing (Drażkowska 2005), which in the case of linen fabrics that are much less resistant to grave conditions than silk. This turns out to be quite troublesome for an archaeologist engaged in reconstructive research. In most cases, it is possible to determine the presence of pillows through the characteristic accumulation of botanical debris directly under the head of the deceased.

In the described burial, the plants were also registered in the form of a bouquet (not well preserved) arranged directly on the child's body (Figs. 1–2).

Archaeobotanical analysis

The archaeobotanical analysis was performed on a 24 g sample taken from the area of the head of the dead infant. It consisted of numerous, dried fragments of plants mixed with fragments of cocoons and insect moults. Firstly, part of the material was secured for palynological analysis (one subsample). About 1 cm³

of the sample was treated with a 10% hydrochloric acid solution (HCl) to remove any carbonate compounds. In the next stage, to remove any humic acids, the matter was treated by hot 10% KOH and macerated by means of the Erdtman acetolysis method. Due to the high content of mineral substances after decantation, the sample was also treated with hot hydrofluoric acid (40% HF) to dissolve the clay fraction (Berglund, Ralska-Jasiewiczowa 1986). The samplings – after standard maceration – were examined under an Axioskop 2 microscope, and the photographic documentation was made with a Zeiss Axiocam ICC3 camera. Pollen and spore identification followed Beug (2004), and the Northwest European Pollen Flora I–VIII (Punt *et al.* 1976–2003). 205 sporomorphs were counted in the pollen sample.

Material for macroremains analysis was dry-sieved on 0.2 mm and 0.5 mm sieves. Each fraction was sorted with the use of a stereoscopic microscope, while specialized atlases (Marek 1954; Kulpa 1974; Cappers *et al.* 2006; Cappers, Bekker 2013) were used for identification. The accuracy of the identification was compared with the collection of carpology collected in the Laboratory of Paleoecology and Archaeobotany



Fig. 1. Burial no. 37/2018 (phot. S. Nowak).



Fig. 2. Location of archaeobotanical sample with common hop (phot. S. Nowak).

of the Plant Ecology Department of the University of Gdańsk (CRefColl-UGDA) and herbal specimens from the Herbarium of Department of Plant Taxonomy and Nature Conservation of the University of Gdańsk (Herbarium Universitatis Gedanensis UGDA).

Results

The archaeobotanical list consisted of thirty-five taxa, which represent crops, segetal and ruderal weeds as well as forest and meadow plants (Table 1).

The analysis of the pollen sample has shown the presence of relatively well-preserved sporomorphs. Twenty-nine individual taxa have been determined – five belonging to a group of trees and shrubs, one to draft shrubs and twenty-three to herbaceous plants. The palynological sample is characterised by a relatively great taxonomic diversity. Mugwort pollen (*Artemisia*, 35%), mint-type pollen (*Mentha* type, 13.2%) and representatives of the celery family (Apiaceae undiff, 6.3%) were most frequently found. The predominance of these three taxa is an indication that the plants could have been put into the coffin on purpose. Less numerous is the pollen from three types of the Asteroideae

subfamily (*Aster*, Asteroideae undiff and *Cirsium/Carduus* – 5.4% in total), unidentified grasses (Poaceae, 4.9%) and bedstraw family (Rubiaceae, 4%). Lower values have also been achieved by bellflower (*Campanula*, 2.9%), crucifers (2.9%) and hops (*Humulus lupulus*, 2.4%). The share of cereals is relatively high: rye (*Secale cereale*, 2.5%) and Cerealia type (2%). Other taxa have reached <2%. Occasional sporomorphs could have entered the coffin as a modern burial pollen or as random pollen grains that were previously deposited on plants.

The analysis of macroscopic remains has revealed numerous findings of plants representing nine taxa (Table 1). The most frequently recorded were the remains of hops (*Humulus lupulus*, Fig. 3 A-E), mainly preserved in the form of fragments of female inflorescences (cones). Among these, the most numerous are bracts (Fig. 3A). They are almost transparent, tracing paper-like leaves of various sizes and shapes. There are also a few strings (axes forming the cone) that look like reindeer antlers (Fig. 3B). Interesting finds were pistils as well as featherlike stigmas (Fig. 3C). In addition, single, spherical fruits (achenes) with a diameter of up to 2 mm have been noted (Fig. 3E). The specimens have a characteristic, cushion-shaped trailer with a distinc-

Table 1. Taxa found in the pillow filling

FAMILY	TAXA	PALYNOLOGICAL ANALYSIS	MACROREMAIN ANALYSIS
Apiaceae	<i>Pimpinella saxifraga</i> L.	–	2
	undiff.	6.3%	1
Asteraceae	<i>Anthemis cotula</i> L.	–	1
	<i>Artemisia</i>	35%	–
	<i>Aster</i>	0.5%	–
	Asteroideae undiff.	1.4%	–
	<i>Cirsium/Carduus</i>	3.5%	–
	<i>Centaurea cyanus</i> L.	0.5%	–
Betulaceae	<i>Betula</i>	1.9%	–
	<i>Corylus avellana</i> L.	1.5%	–
Boraginaceae	<i>Symphytum</i>	1.9%	–
Brassicaceae	undiff.	2.9%	–
Campanulaceae	<i>Campanula</i>	2.9%	–
Cannabaceae	<i>Humulus lupulus</i> L.	2.4%	>500
Chenopodiaceae	undiff.	1.5%	–
Ericaceae	<i>Calluna vulgaris</i> (L.) Hull	1%	–
Fabaceae	<i>Lathyrus</i>	0.5%	–
Lamiaceae	<i>Rosmarinus officinalis</i> L.	–	2
	<i>Stachys</i> type	3%	–
	<i>Mentha</i> type	13.2%	–
Linaceae	<i>Linum usitatissimum</i> L.	–	2
Malvaceae	undiff.	–	1
Pinaceae	<i>Pinus sylvestris</i> L.	3%	–
Poaceae	Cerealina	2%	–
	<i>Secale cereale</i> L.	2.5%	–
	undiff.	4.9%	3
Polygonaceae	<i>Polygonum</i>	–	1
	<i>Polygonum persicaria</i> type	0.5%	–
	<i>Rumex acetosa/acetosella</i> type	0.4%	–
Primulaceae	<i>Lysimachia</i>	0.9%	–
Ranunculaceae	<i>Ranunculus</i>	0.4%	–
Rubiaceae	undiff.	4%	–
Tiliaceae	<i>Tilia</i>	0.5%	–
Ulmaceae	<i>Ulmus</i>	0.5%	–
Urticaceae	<i>Urtica</i>	0.5%	–
others	fungal spores	–	7
	moss fragments	–	2
	leaf fragments	–	+

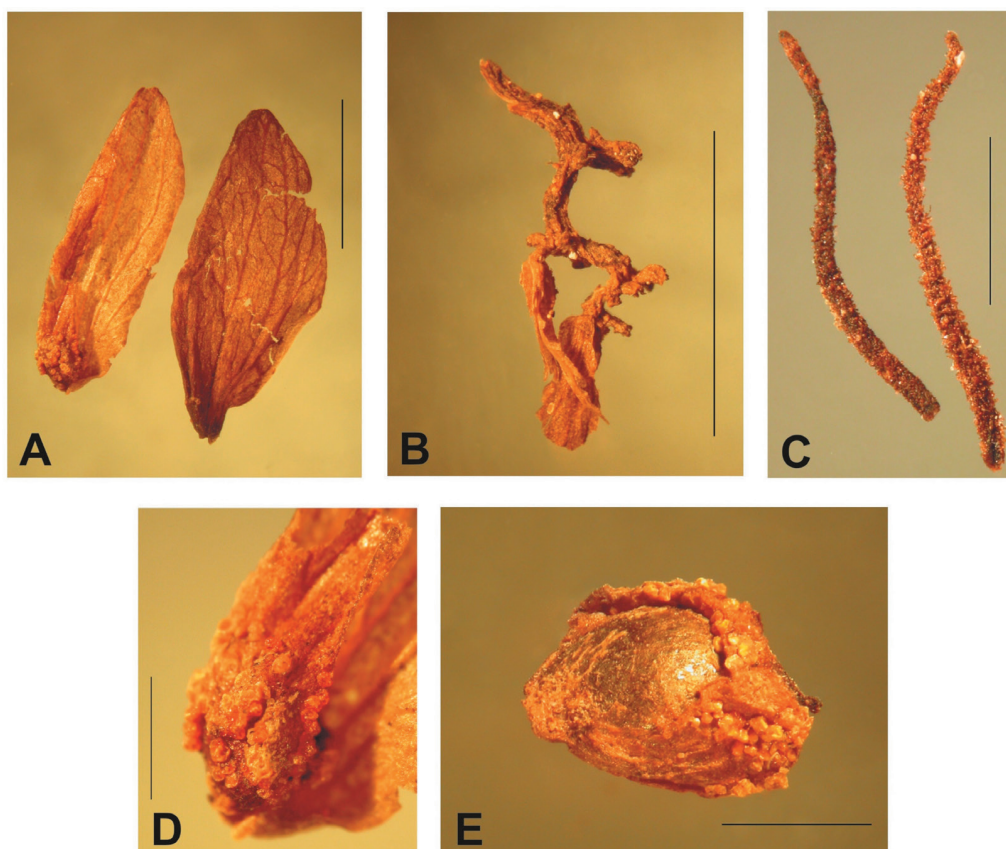


Fig. 3. Macroremains of the common hop. A – bracts, B – strig with remaining bracts, C – stigmas, D – lupulin on a bract, E – achene (phot. M. Badura, M. Jarosińska); scale bars equal 1 mm.

tive appendix. There were yellowish lupulin particles on the surface of the fruits and partially on the bracts (Fig. 3D). Lupulin is responsible for the bitter taste and strong aroma of hops, it also contains substances such as terpenes, tannins, resin compounds and flavonoids (Strzelecka, Kowalski 2000).

In addition to hops, single fruits of stinking chamomile (*Anthemis cotula*), burnet-saxifrage (*Pimpinella saxifraga*) and flax (*Linum usitatissimum*) have been recorded. In the absence of unambiguous diagnostic features, identification of some of the fruits is to the genus type (*Polygonum* sp.) or family (Apiaceae, Poaceae). The sample has also shown the presence of the perianth from the mallows family (Malvaceae), fragments of rosemary leaves (*Rosmarinus officinalis*), moss remains, fungal spores and indeterminate vegetative parts of herbaceous plants.

Humulus lupulus – common hop

The results of the analysis of the macroscopic remains may suggest the intentional use of hops as the basic component of the pillow filling. In the palynological spectrum, this species is represented by single pol-

len grains (2.4% of the total of all determined grains). Such a small share of hop pollen can be explained by the selective farming of female specimens or selective use of female specimens in funeral customs, thus the presence of a small amount of pollen.

Hops are a dioecious plant (female and male reproductive organs occur on various individuals), perennial, from the Cannabaceae family. Stalks – so called shoots – grow up to 10 m in natural conditions. It usually occurs in climbing form, but in the absence of support, it may take a creeping form. It always winds clockwise. Male inflorescences (containing only stamens) are paniculate and embedded singly on short petioles. Pistillate flowers (female, containing one or more pistils) are collected in more or less loose clusters – strobili – resembling cones, borne in the axils of bracts and bracteoles. The cone is an inflorescence, consisting of nodes and internodes; at each node there are four flowers. A single flower consists of a spherical ovary, a pistil completed with a double feathered stigmas and a stipule. At the base of the bract and bracteoles, there are numerous multicellular glands containing lupulin. Hop is an anemophilous plant

and its fruit is a spherical nut with a diameter of up to 2 mm, orange to pale brown. It blooms from August to September and, under favourable conditions, fruits from the second half of August. In natural conditions, it occurs in moist habitats, in riparian and alder forests, and often forms tall herb fringe communities; in anthropogenically transformed forests it develops on forest edge communities, although it also eagerly takes up anthropogenic positions co-creating hedges (Herse 1980; Behre 1999; Hanelt *et al.* 2001). Hops are believed to be natives of Europe and America (Davis 1957 after: de Candolle 1885), although Majewski (1893) suggests a foreign origin. Currently, it is cultivated almost all over the world and in the wild it occurs in almost all of Europe, western and central Asia and North America (Davis 1957; Tutin *et al.* 1964; Szafer *et al.* 1986).

At archaeobotanical sites in Europe, hops are already recorded in the Neolithic period, however, until the Roman period only single ovules were found. A significant increase in the share of the remains of this plant is noticeable in the early Middle Ages, which may result from the development of brewing at the time (Behre 1999; Beck 2005). The knowledge of how to use hops was probably brought by monks or pagan Slavs, who brought the custom of hopping beer from their neighbours, Finns and Tartars (Majewski 1893 after: Doublet 1625; Brückner 1937; Hegi 1957; Nowiński 1980; Kujawska 2016). There are only female specimens in hop cultivation; males are eliminated from the plantation. This is to avoid fertilization, after which female inflorescences lose their quality as a brewer's raw material (Herse 1980). However, the appearance of hops in the material from the crypt would indicate the presence of male specimens among the crops or in the close surroundings from which the material for pillow filling came.

In folk medicine, the common hop is famous for its healing and aromatic properties. Many sources indicate the use of hops to relieve nervousness, headaches, insomnia and fever, as well as to support appetite, in urinary tract diseases, and externally as a treatment for scalp diseases (Kluk 1808; Davis 1957; Paluch 1984, 1989; Rejewski 1992; Schiller *et al.* 2006; Kujawska 2016). At present, the antibacterial, antifungal and antiviral, or even chemopreventive effects of compounds contained in hops have been found and are undergoing further research (Mielczarek *et al.* 2010).

Hops also played an important role in folk customs. At Easter, it was intertwined into palms, and on the Assumption Day (August 15th), it was used to arrange bouquets. The common hop also played a special role in wedding ceremonies: it was considered to be the ally of love and the 'marriage maker,' a symbol of cour-

age and marriage, and during the wedding – the symbol of the groom. It was not only added to beer, honey and bread dough were also flavoured with it (Majewski 1893; Paluch 1984; Kujawska 2016). It is mentioned in the popular folk song of *Oj chmielu, chmielu* sung during some Polish wedding customs (Brückner, Estreicher 1939; Szcześniak 2013) and in works by various contemporary authors (Pawlikowska-Jasnorzewska 1937; Grechuta 1979; Bajor 1983–1993). In the past it was popular to plant the vines by the houses, in the area of porches – it was supposed to calm the farmers returning from the field; a hop climbing under the windows of the bedroom and stuffed into pillows made falling asleep easier (Davis 1957 after: Johnson 1867; Morgan 1952; Kujawska 2016).

Such a wide use of the common hop has been transferred to funeral rites. It is known from the literature that hops would be scattered in the doorway when the dead body was carried through (Szcześniak 2013). Based on Józef Rostafiński's surveys, it is known that in Poland, at the turn of the 19th and 20th centuries, coffin pillows were made from hops, which was included in the set of holy plants for the Assumption Day (Köhler 2017). Remains of hops were already found in the pillows of Mazovian dukes (Pela 1997), King Sigismund II Augustus, Anna Jagiellon and Stephen Báthory (Rožek 1977), as well as in the coffins of the Griffin Dukes of Słupsk (Rawa-Szubert *et al.* 1981), burial crypts under the floor of the Jasna Góra Monastery of the Blessed Virgin (Galera *et al.* 2013) and in the 18th/19th children's burials from Bytom Odrzański (Grupa 2011). The moment of death is known to have been compared to sleeping in various ways (Pokropek 1993). It can be assumed that the practice of putting hop cones in the coffin or pouring them in front of the deceased were supposed to 'calm down' his/her soul, and stuffed in a pillow to give the deceased a good night's sleep. However, their antimicrobial and antifungal properties could also be important.

Other plants

The botanical study has shown that the sample, apart from common hop, also included other plant species (Table 1). Considering their ecological requirements (Zarzycki *et al.* 2002; Matuszkiewicz 2018), they certainly did not grow together with hops, whether cultivated or in the wild. It is possible that the aesthetic values in the form of the splendid umbels of burnet-saxifrage and its rather intense smell speak for the purposeful composition of the plant in the coffin. Rosemary is also characterized by a strong aroma. Moreover, it is also a symbol of memory, in

wedding ceremonies it was woven into wreaths along with myrtle and put under the pillow was to facilitate falling asleep (Szczęśniak 2013). Perhaps, just like hops, rosemary leaves were placed in the coffin on purpose in order to soothe the soul of the deceased. However, it cannot be ruled out that these plants were part of bouquets placed around the head of the deceased child and as a result of fossilization mingled with the hop-filled pillows. The use of rosemary branches as an ornament on the head of the deceased child finds confirmation in the iconographic material (Drażkowska 2006).

The filling of the pillow may have been contaminated with plant material at the time of the sampling for archaeobotanical research. Pollen analysis revealed the significant share of *Artemisia* pollen, macroremains of which were not noted in the sample. Probably the source of wormwood spores was the bouquet that was also put into the coffin. The high proportion of pollen in *Mentha* type and plants from the Apiaceae family confirm the presence of plants characterized by an intense aroma. Interestingly, the presence of rye *Secale cereale* and weeds typical of its cultivation (cornflower *Centaurea cyanus*, common sorrel/ red sorrel type *Rumex acetosa/acetosella* type) has been determined in palynological samples, but not found among macroremains. It is possible that the pollen grains of these plants found their way into the coffin during the preparation of the burial. In view of the flowering time of both plants, this could have taken place in July or August. There is also a possibility of pollen mixing with the rest of macroremains when hops were being harvested. Cereals may have been grown in an adjacent field.

Summary

The advantage of archaeobotanical research is the ability to recognize and describe plants that were part of the funeral ceremony. As the example of the described burial demonstrates, the quality of results depends primarily on the condition in which the plants have been preserved. Also, the field work (method of collecting material during archaeological work, the choice of research methods), as well as the transport to the laboratory and storage are crucial. For this reason, the first stage of work may have a major impact on the quality of results.

Burial no. 37/2018 is a great example of the practical use of a plant with a high symbolic meaning at the same time. The choice of the common hop, the main ingredient of the pillow filling, was dictated by its fragrance – the characteristic aroma of lupulin could screen the smell of the corpses. Applying hop cones under the head of the deceased child was also imposed

by the desire to provide comfort after death. The few reports about the presence of hops in burials indicate that this species was used regardless of the status of the deceased person. One can, therefore, be tempted to say that in funeral practices it was a ‘universal’ plant. The low percentage of hop pollen may, on the one hand, indicate the selective and purposeful use of hop cones in funeral rites, and on the other – the fact that only female specimens were selected for cultivation in the 18th and 19th centuries.

The presented results are only a fragment of archaeobotanical research conducted in the crypts of Byszewo. Collecting data from other burials will allow the more accurate identification of plants and the indication of their role in funeral practices used by the local community.

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