

Loose human bones as evidence of the multi-step burial rite: Case study of the Stone Age hunter-gatherer sites at Dudka and Szczepanki, Masuria (northeastern Poland)

Izolované lidské kosti jako doklad vícefázového pohřebního ritu: případová studie lokalit lovců-sběračů doby kamenné Dudka a Szczepanki v Mazursku (severovýchodní Polsko)

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KEYWORDS

Mesolithic – Para-Neolithic – loose human bones – temporary burials – ancestor cult

ABSTRACT

The Dudka and Szczepanki sites yielded numerous loose human bones. They were found at the main cemetery at Dudka and in all the main settlement zones and are connected with multi-step burial rites, which were practiced by local hunter-gatherer society, especially in the Para-Neolithic period. Loose human bones from the settlement areas result from two ritual practices: temporary burials and the storage of bones at the encampment. Temporary burials were deposited mostly in the eastern bay at Dudka (trench III) from the Early Mesolithic to classic Zedmar period, when a large increase in their number is observed. Temporary burials were deposited on the slope between the encampment and the lake. Most human remains from Szczepanki may also be interpreted as temporary burials, which were located on the shore or directly at the encampment. The evidence of frequent storage of bones, especially skulls, is documented for the encampment area in trench I at Dudka as well as for the settled plateau in trench III, but mainly in the post-Zedmar period. Loose human bones at the main cemetery at Dudka may be connected with different ritual activities as well. Some of the bones come from possible emptied graves, i.e. most bones of the deceased were intentionally removed from the graves. Single bones, especially skulls and mandibles, may have been deposited as secondary burials in small pits or directly on the ground of the cemetery.

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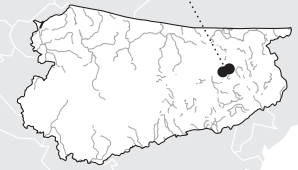
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1. Introduction

Loose human bones are a widespread phenomenon on the Mesolithic and Para-Neolithic sites. However, their appearance at settlement sites was often ignored or, if loose human bones were reported, they were usually interpreted as the result of the destruction of graves or just as a remnant of cannibalistic practices. Only a few older papers include a broader discussion of loose human bones and an attempt to interpret them in another way. Such analyses were conducted, for example, for the Ageröd site in Sweden (Larsson et al. 1981) and for Oronsay in Scotland (Meiklejohn, Denston 1987). Researchers put forward the thesis that loose human bones may be the result of abandoning the deceased without a formal burial or another unusual form of burial that caused the disintegration of the skeleton (Larsson et al. 1981; Meiklejohn, Denston 1987). Loose human bones have only begun to be taken into account in more recent studies on funeral rites in the last two decades (Brinch Petersen 2001; 2016; Gumiński 2003; Louwe Kooijmans 2007; Jensen 2009; Gray Jones 2011; Wallin 2013; Bugajska, Gumiński 2016; Gummesson, Molin 2016; Hallgren, Fornander 2016; Louwe Kooijmans et al. 2016; Orschiedt, Kind 2016; Sørensen 2016). This phenomenon was recently more often connected with various ritual behaviours including complex and unusual burial practices such as those placed on platforms (Louwe Kooijmans 2007), sky burials (Sørensen 2016), simply leaving the body until skeletonization occurs in the open air (Brinch Petersen 2001; Wallin 2013), manipulation with the dug-up bones of ancestors (Wallin 2013), storage of the bones of the dead at the settlement (Jensen 2009, 470–471), etc. Loose human bones that occurred at the Dudka site were clearly associated with the two-stage funeral rite for the first time by W. Gumiński over 20 years ago (Gumiński 2003). Such an interpretation was based on the presence of one secondary burial from grave VI-1, the only grave uncovered at Dudka cemetery at that time, and taking into account numerous human bones scattered within the settlement area of the site, especially in trench III (Gumiński 2003). Further excavations at Dudka and the neighbouring Szczepanki site produced much more evidence of the multi-step burial rites practised by local hunter-gatherers in the Stone Age (Bugajska 2015; 2021; 2023; Bugajska, Gumiński 2016; Gumiński, Bugajska 2016;). It was possible to make a kind of model of multi-step burial rites based on the detailed analyses of human bone material from Dudka and Szczepanki as well as on general ethnographic data (Fig. 1).

Multi-step burial rites may have different scenarios known from different ethnographic records (Thomas 1980; Brinch Petersen 2016; Struwe 2016). The most classic multi-step burial scenario is based on the temporary burial of the dead for the time of soft tissue decomposition, after which the bones are



collected and taken to the destination grave at the cemetery (Fig. 1). However, this is a simplified scheme, since various changes and extensions of the ceremony may occur. Some of the large and distinctive bones can be intentionally left at the place of temporary burial. It is possible, too, that collected bones may be deposited not in one destination grave, but in two or even a few different graves at the cemetery. Some bones can also be taken to the settlement and kept there as a type of memorabilia of the dead. As a result, the number of stages of such a complex ritual may vary.

Multi-stage burial customs also include situations in which the deceased was placed in a grave at the cemetery, but the grave was later disturbed and selected bones from the primary burial were taken. The rest of the skeleton may lay in an anatomical position or be subsequently rearranged inside the grave (Fig. 1). Examples of such intentionally disturbed primary burials are known from Dudka cemetery (Bugajska, Gumiński 2016, 511–544; Gumiński, Bugajska 2016, 465–510; Bugajska 2021). Similar practices, i.e. primary burials with the surprising absence of particular bones, were also recorded at other Mesolithic and Para-Neolithic sites on the European Plain (Rydbeck 1950; Larsson 1984; Weber 1998; Nilsson-Stutz 2003, 309–314; Wallin 2013; Bugajska 2014, 25–27; Grünberg 2016, 268–271). It is also possible that even the entire skeleton was intentionally taken out from the grave, not just single bones, resulting in an empty grave with single overlooked human bones and possible grave goods. Evidence of such a practice was already suggested for the Dudka cemetery, where some almost empty pits containing scarce human remains were uncovered (Bugajska 2021). The presence of the empty graves is also known from other sites, e.g. from the cemeteries at Skateholm in Sweden (Larsson 1983, 33; 1989, 375–376) and at Vedbæk in Denmark (Albrethsen, Brinch Petersen 1977, 9), but usually it is difficult to state if such structures were cenotaphs or graves from which the body or skeleton of the dead was taken out, because the pits did not contain any human remains (Nilsson-Stutz 2003, 250–251, 312–313).

In conclusion, loose human bones can be connected with different stages of the complex multi-step burial rite and with other various ritual behaviours (Fig. 1). At the place of temporary

burial, we can especially expect bones that were lost and overlooked, i.e. mostly small elements of the skeleton. A similar bone structure should be expected in the case of emptied graves. In contrast, larger and distinctive bones may occur at the settlement, where they could have been stored or at the cemetery as a partial secondary burial deposited in the pit or directly on the ground of the cemetery.

2. Dudka and Szczepanki – general data about the sites, burials and loose human bones (LBH)

Dudka and Szczepanki are two neighbouring sites located on the islands on the former Lake Staświn in Masuria in north-eastern Poland (Fig. 2). Both sites were settled from the Late Paleolithic until the end of the Late Neolithic (Tab. 1). The economy was based on hunting and gathering until the end of the Stone Age. In the Mesolithic period, both islands were settled seasonally, Dudka mainly in the spring, Szczepanki in the autumn. In the Para-Neolithic, the settlement strategy changed and both islands were probably settled year-round, as is indicated by the rapid growth in the settlement intensity at both sites. In the Bronze Age, the islands were completely abandoned due to the complete bogging of the lake, making it unattractive for settlement (Gumiński 1999; 2004; 2008; 2012; Gumiński, Michniewicz 2003). The Para-Neolithic period, i.e. the Zedmar culture, is connected with the appearance of pottery around 5600 BP. Zedmar pottery belongs to the western Para-Neolithic along with the pottery of the Ertebølle and Swifterbant cultures. The oldest Zedmar pottery was locally produced and had its specific and syncretic style of ornamentation, vessel forms and technology. Distinctive features of Zedmar pottery are especially the flat bottoms of pots, similar as in the Swifterbant culture, and even bottoms with a foot (Gumiński 2020).

Excavations at the Dudka site were conducted in the following seasons in the years 1985–1999, whereas Szczepanki site 8 was investigated in the years 2001–2019 (Gumiński 1999; 2004; 2012; Gumiński, Bugajska 2023). In the last season, excavations were carried out again after a long break at the Dudka site. Excavation was focused in the cemetery area. Trench VI was extended in the southern direction. Additionally, trench XIII was

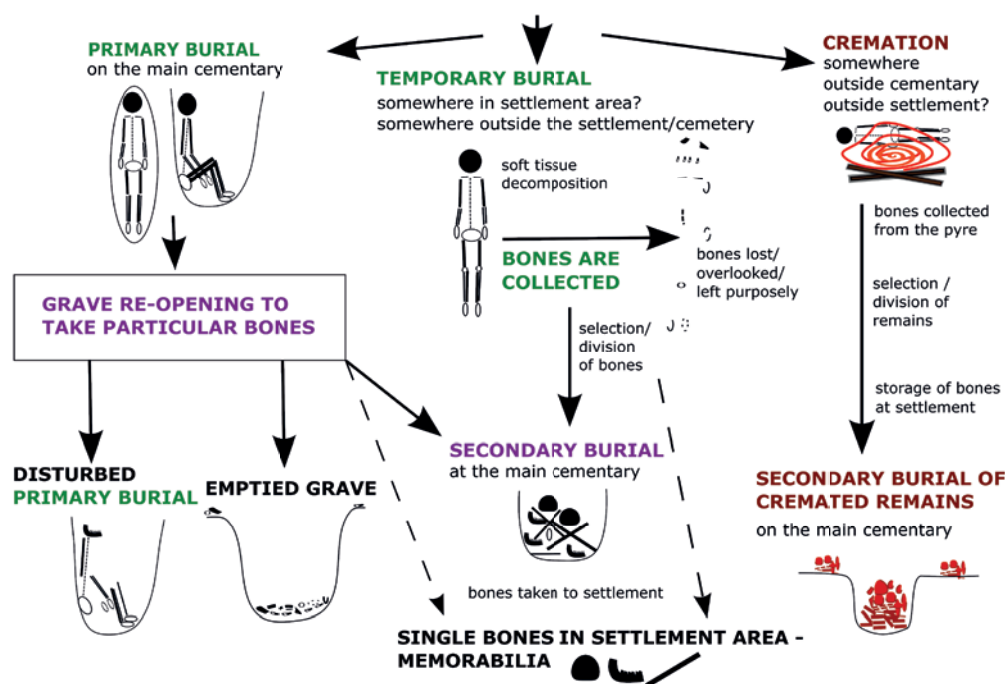


Fig. 1. Scheme of the multi-step burial rites including evidence from Dudka and Szczepanki. Author K. Bugajska.

Obr. 1. Schéma víceúrovňových pohřebních ritů zahrnující nálezy z lokalit Dudka a Szczepanki. Autor K. Bugajska.

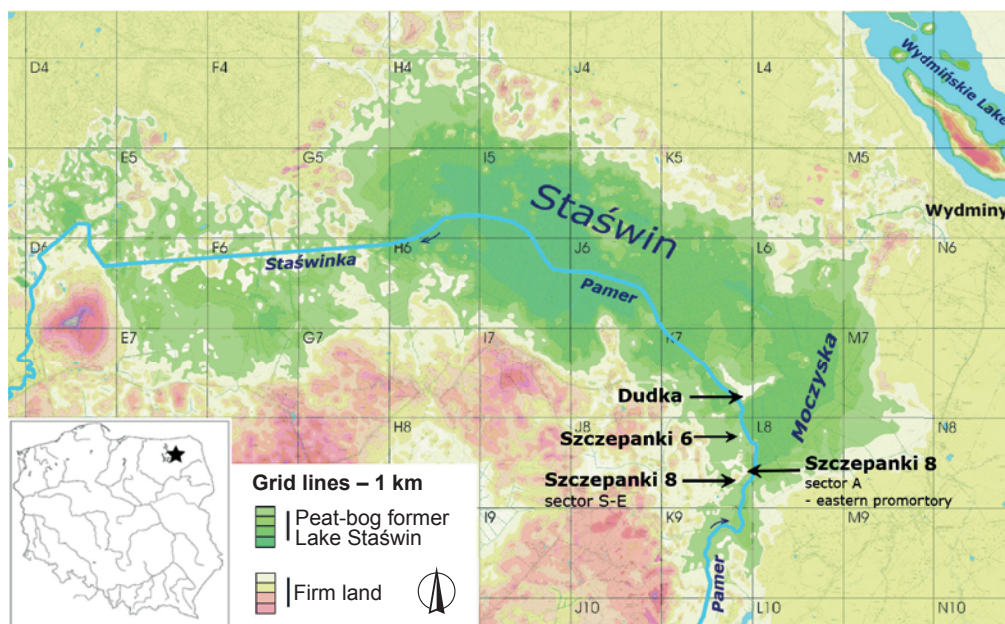


Fig. 2. Map of Lake Staświn with location of the Dudka and Szczepanki sites. Author W. Gumiński.

Obr. 2. Mapa jezera Staświn s umístěním lokalit Dudka a Szczepanki. Autor W. Gumiński.

Archeological period	Period	Years ¹⁴ C BP	Cal. BC
Late Paleolithic	Allerod – Younger Dryas	11200–9800	11200–9250
Early Mesolithic	Preboreal – Boreal	9800–8000	9250–7000
Late Mesolithic	Early-middle Atlantic	8000–5600	7000–4500
Para-Neolithic (pottery appearance)	Early Zedmar	Late Atlantic	5600–5100
	Classic Zedmar	Atlantic/Subboreal	5100–4700
	Post-Zedmar	Early Subboreal	4700–4200
Late Neolithic	Early/middle Subboreal	4200–3700	2800–2200

Tab. 1. Chronology of Stone Age occupation at Dudka site. The chronology of the Dudka and Szczepanki sites is based on stratigraphy and relevant radiocarbon dates (44 from Dudka and 16 from Szczepanki) obtained mostly from charcoal (Gumiński 1995; 1999; 2008; 2012; Gumiński, Bugajska 2023; Gumiński, Michniewicz 2003).

Tab. 1. Chronologie osídlení z doby kamenné na lokalitě Dudka. Chronologie lokalit Dudka a Szczepanki je založená na stratigrafii a relevantních radiokarbonových datech (44 z lokality Dudka, 16 z lokality Szczepanki) získaných převážně z uhlíků (Gumiński 1995; 1999; 2008; 2012; Gumiński, Bugajska 2023; Gumiński, Michniewicz 2003).

located between the cemetery (trench VI) and the littoral zone below (trench XI) (Fig. 3). In both cases, a large number of human bones were uncovered, including cremated remains. Bone material is still being analysed, but some new evidence from the cemetery is included in the paper.

The cemetery at Dudka was located between two main settlement areas, i.e. the southern foreland (trench I) and the eastern bay (trench III) (Fig. 3). The cemetery yielded 28 graves and over 2,700 bone fragments, mostly cremated, which were found outside the pits (Tab. 2). At least 118 individuals were determined based on bone material from graves as well as on loose human bones. Most graves at the cemetery were collective and contained different burial types (Graph 1). The unique feature of the Dudka cemetery is the distinct predominance of secondary burials (33%) over primary ones (11%). Secondary burials were deposited in separate grave pits, were added to primary sitting burials or were deposited directly on the ground surface of the cemetery (Bugajska, Gumiński 2016; Gumiński, Bugajska 2016; Bugajska 2021). The large share of cremations (52%) is also unique for the Stone Age hunter-gatherer site (Bugajska 2023). Two graves at the Dudka cemetery, VI-6 and VI-13, were disturbed in the Stone Age in order to collect some bones of particular deceased individuals. Moreover, at least four pits from the cemetery were interpreted as emptied graves from which a whole skeleton of the dead was removed from the grave pit (Bugajska 2021).

Loose human bones appeared not only at the cemetery (trench VI), but also in settlement areas of Dudka island. There are in total 552 human bones, which come mostly from trench III. It was one of the main settlement areas at the site called the ‘eastern bay’ (Fig. 3; Tab. 2). Smaller assemblages of bones come from the second main occupation area at the southern foreland (trench I, II, XII). In turn, a comparatively large number of human remains was also uncovered in small trench IV located on the plateau and near the main cemetery, as well as in trenches XI and XIII located between the cemetery and the lake shoreline. All of these locations may be interpreted as a kind of periphery of the main cemetery, and that is why human remains are so abundant there. In trench IV, possible graves were probably destroyed by the later Late Neolithic settlement activity. In turn, human remains found in trenches XI and XIII, i.e. on the sloping shore of the island and in the littoral zone of the lake, could have moved down from the cemetery area as a result of post-depositional processes (Fig. 3).

At the Szczepanki site, two graves with primary burials of ca six-month-old infants were uncovered. Grave S-1 with the infant placed on its left side is dated to the early Zedmar period based on stratigraphy. The burial was found near a settlement structure dated to the same period. Grave S-2 with the child buried in the supine position and covered with ochre may even date to the Late Paleolithic according to stratigraphy. The infant’s skeleton was

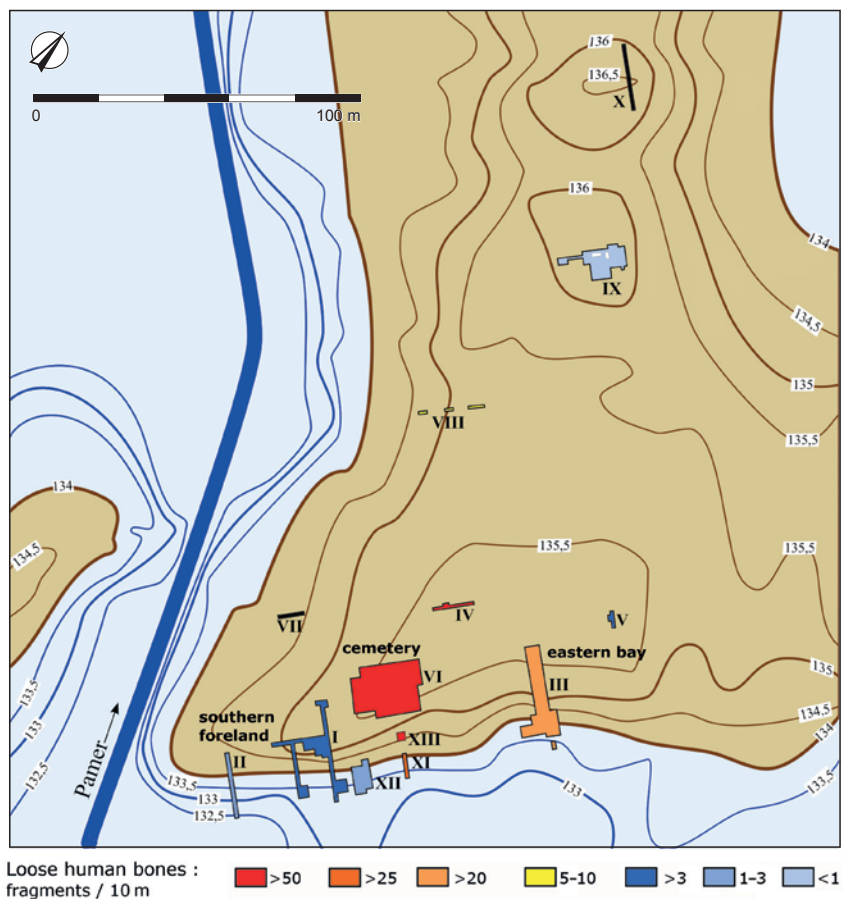
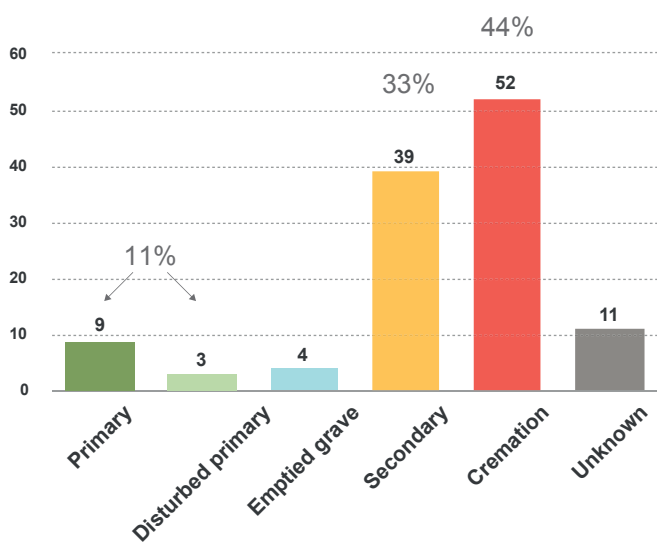


Fig. 3. Dudka site. Trenches with loose human bones are marked in colour. Author W. Gumiński, K. Bugajska.

Obr. 3. Lokalita Dudka. Barevně jsou vyznačeny sondy s izolovanými lidskými kosterními pozůstatky. Autor W. Gumiński, K. Bugajska.

located in a gravel layer in which a few Paleolithic flint artefacts were found as well. In both cases, the bones of the infants do not contain enough collagen for direct radiocarbon dating (Gumiński, Bugajska 2016, 468–470). Besides the two primary burials, 55 loose human bones were found at the Szczepanki site. However, this is not a large number of bone fragments considering the large size of the area was excavated at the site (Fig. 4).



Graph 1. Dudka. Burial types at the cemetery.

Graf 1. Dudka. Typy pohřbů na pohřebišti.

This paper will focus primarily on numerous loose human bones from the main settlement areas at Dudka and Szczepanki, i.e. the southern foreland (trenches I, II, XII) and the western bay (trench III) at Dudka and the southern settlement (sector E and S) at Szczepanki (Fig. 3, 4). The main point is to compare these three areas and to determine which ritual practice took place there – temporary burials or bone storage at the encampment? Moreover, loose human bones from these settlement areas generally come from well-dated layers and it was possible to divide the material into particular archaeological periods (Appendix 1, 2).

3. Methods of osteological and taphonomic analyses of loose human bones

All bone pieces identified as human were counted for each trench and were subsequently divided into particular archaeological periods based on the stratigraphic position of bones in dated layers. It should be added, however, that the chronological division has certain limits. It was impossible to separate the post-Zedmar and Late Neolithic bone material, because the uppermost layers were more or less mixed. As a result, human remains from these layers were analysed as one assemblage. The chronological division of bone material was not possible at all for the cemetery (trench VI), because loose human bones occurring beyond the grave context appeared mostly in the upper layers destroyed by ploughing. Therefore, the precise origin and chronological affiliation of these remains is unknown. The same applies to trench IV, where human remains appeared within the Late Neolithic layers, but they could come from the destroyed older graves.

The osteological determination of all human bone fragments was made as precisely as possible. The minimum number of bones (MNE) was determined for each trench and archaeological

Site	Trench	Trench area	Human bone fragments	Minimum bone number (MNE)	Minimum number of individuals (MNI)
Dudka	I	118 m ²	51	14	8
Dudka	II	20 m ²	2	2	2
Dudka	XII	50 m ²	9	2	2
Dudka, southern promontory	I, II, XII	188 m²	62	18	12
Dudka	III	149 m ²	328	82	38
Dudka	V	7 m ²	3	1	1
Dudka, eastern bay	III, V	156 m²	331	83	39
Dudka, western coast	VIII	11 m ²	9	4	1
Dudka, interior	IX	101 m ²	6	2	2?
Dudka, periphery of cemetery?	IV	14 m ²	81	25	8
Dudka, periphery of cemetery?	XI	7 m ²	21	6	4
Dudka, periphery of cemetery	XIII	4 m ²	11	5	2
Dudka, periphery of cemetery – cremation	XIII	4 m ²	31 (-55)	6	2
Dudka (without cemetery)	I-XIII	481 m²	552 (-575)	149	70
Dudka cemetery – cremation	VI	259 m ²	1803 (-1871)	–	9
Dudka cemetery – bones from destroyed graves	VI	259 m ²	485	–	–
Dudka cemetery – unburned bones	VI	259 m ²	467	98	26
Dudka cemetery	VI	259 m²	2755	98	35
Dudka – total	I-XIII	740 m²	3307	247	105
Szczepanki	E	262 m ²	27	14	10
Szczepanki	S	178 m ²	28	16	12
Szczepanki – total	E+S	440 m²	55	30	22
Dudka + Szczepanki	–	1180 m²	3362	277	127

Tab. 2. Loose human bones at Dudka and Szczepanki.

Tab. 2. Izolované lidské kosti z lokalit Dudka a Szczepanki.

period (Appendix 1, 2). There are different methods for calculating MNE and MNI (minimum number of individuals) by the osteologist depending on the fragmentation and character of analysed bone assemblages (Knüsel, Robb 2016). The large fragmentation of bone material from Dudka and Szczepanki required the use of a method of calculating based not only on repeated diagnostic elements, but also on general morphology and bone size.

Cranial bones were reconstructed from numerous pieces to the greatest possible extent. If it was possible, numerous loose cranial pieces were matched to particular reconstructed bones depending on their size, morphology and age or sex determination. In the final step, the minimum number of crania was estimated. The same procedure was applied in the case of fragmented long bones.

The cranium and mandible were treated as two separated bones in the calculation of minimum bone number. A single loose tooth was calculated as one bone fragment, whereas the distinguished sets of loose upper or lower teeth belonging to the same individual were generally counted as one bone – mandible or maxilla/cranium (MNE), except the cases in which loose teeth were matched to a given cranium or mandible. The pelvises of adult individuals were counted as two bones, left and right. Fragments of vertebrae and ribs were the less frequent elements in bone material, and they were usually counted as ‘one bone’, except in cases when it was possible to state that fragments come with certainty from the same single vertebra or rib (Appendix 1, 2).

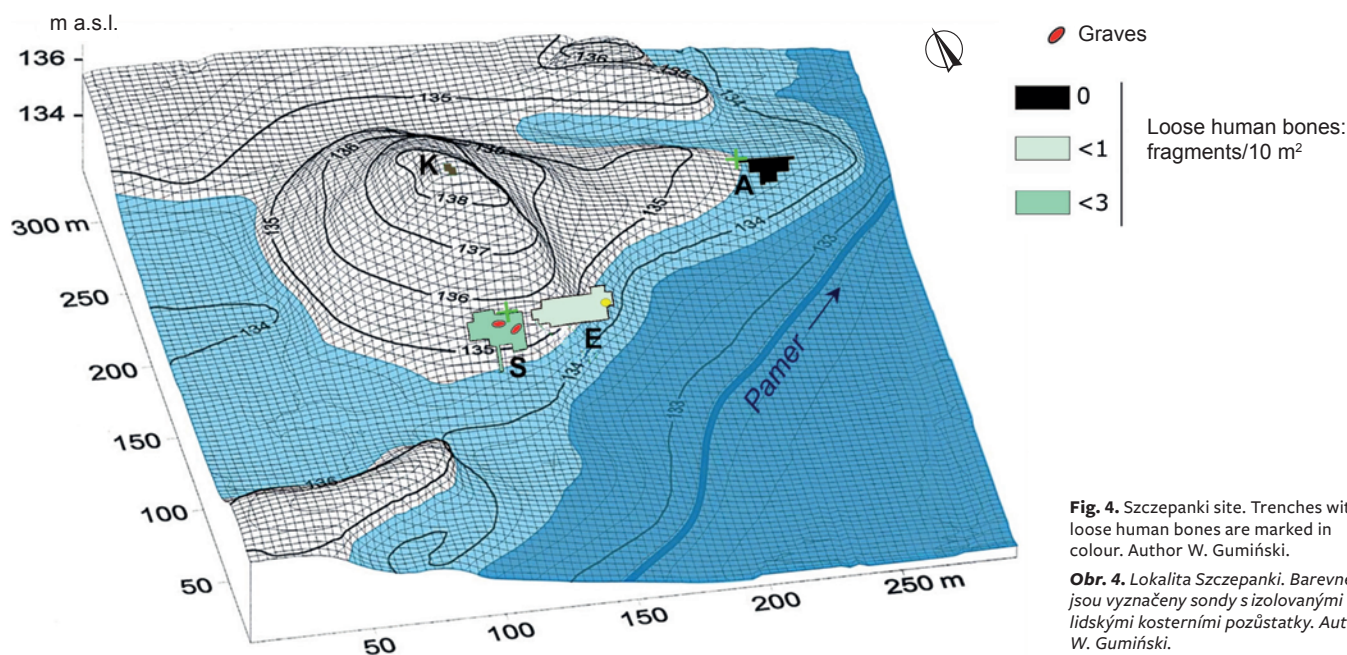


Fig. 4. Szczepanki site. Trenches with loose human bones are marked in colour. Author W. Gumiński.

Obr. 4. Lokalita Szczepanki. Barevně jsou vyznačeny sondy s izolovanými lidskými kosterními pozůstatky. Autor W. Gumiński.

Crania or sets of teeth were the most frequently repeating anatomical elements in the assemblages and the minimum number of individuals (MNI) was very often based on them. However, the MNI estimation was based not only on the standard calculation of determined anatomical elements – MNE (Knüsel, Robb 2016), but using all available additional osteological and archaeological information. The morphology and size of bones, sex and age determination as well as stratigraphical and special provenience of bones were always taken into account. In general, the estimation of the minimum number of individuals was determined after a compilation of distinguished postcranial skeletons (usually separately numbered) with determined skulls represented by crania, mandibles and/or sets of loose teeth.

The sex and age assessment was not possible for all individuals and it was usually based only on the observation of single bones or features, because of the incompleteness of the skeletons and general character of available bone material. The sex assessment was made on the basis of distinctive features of the pelvis or skull according to commonly used standards (Buikstra et al. eds. 1994, 16–20; White et al. 2012, 408–419). In some cases, the size and massiveness of specific bones could be used to determine the possible sex of a given individual, especially if the bone fragments were distinctively massive or gracile. This determination was

marked as uncertain in the table and should be taken with caution (Appendix 1, 2). The possibilities of age assessment were also very limited and various standard methods were applied (Buikstra et al. eds. 1994, 21–53; Scheafer et al. 2009; White et al. 2012, 379–408) depending on the available bone material. It should be noted that the age was usually estimated using a single bone or tooth, so it should be treated with some caution as well.

The taphonomic analysis included a study of the spread of human remains and their special relation to the encampment areas and the lakeshore, the identification of possible anatomical arrangements of bones, analyses of the anatomical structure of bone assemblages as well as the analysis of bone fragmentation and preservation, including possible traces on the bones such as: burning, gnawing by animals or any human manipulation.

4. Loose human bones at the main cemetery at Dudka and its peripheries.

4.1 Main cemetery – trench VI

A large part of the human bones, over 1,800 fragments, found outside a grave context at the cemetery was heavily burned (Tab. 2), perhaps the result of a specific form of cremation burial used at Dudka. Cremated remains were very often deposited in

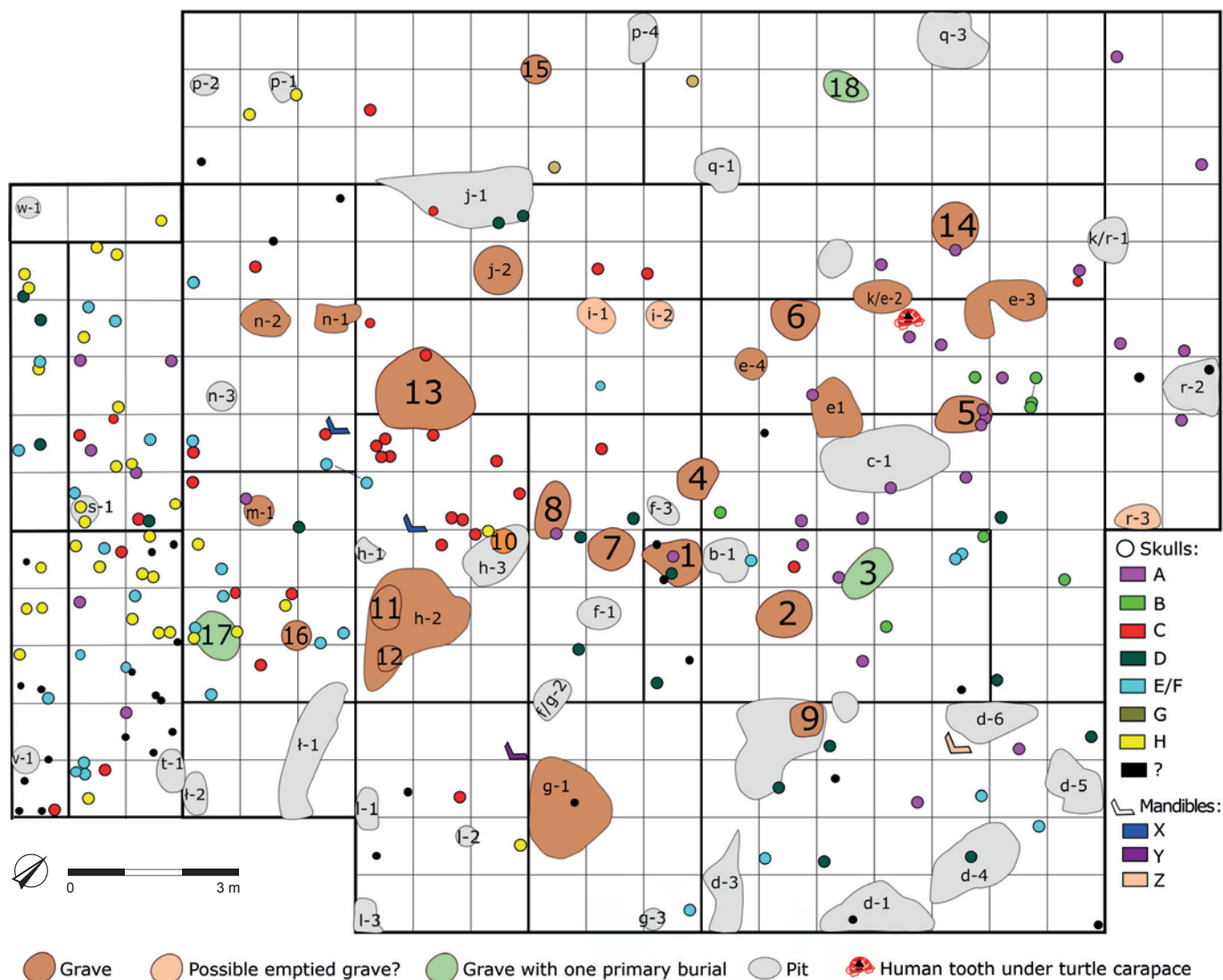


Fig. 5. Dudka, trench VI, main cemetery. Distribution of cranial fragments and mandibles. Bones of particular skull or mandible are marked with different colours. Author K. Bugajska.
Fig. 5. Dudka, sonda VI, hlavní pohřebiště. Distribuce fragmentů lebky a dolních čelistí. Kostí konkrétní lebky nebo dolní čelisti jsou označeny různými barvami. Autor K. Bugajska.

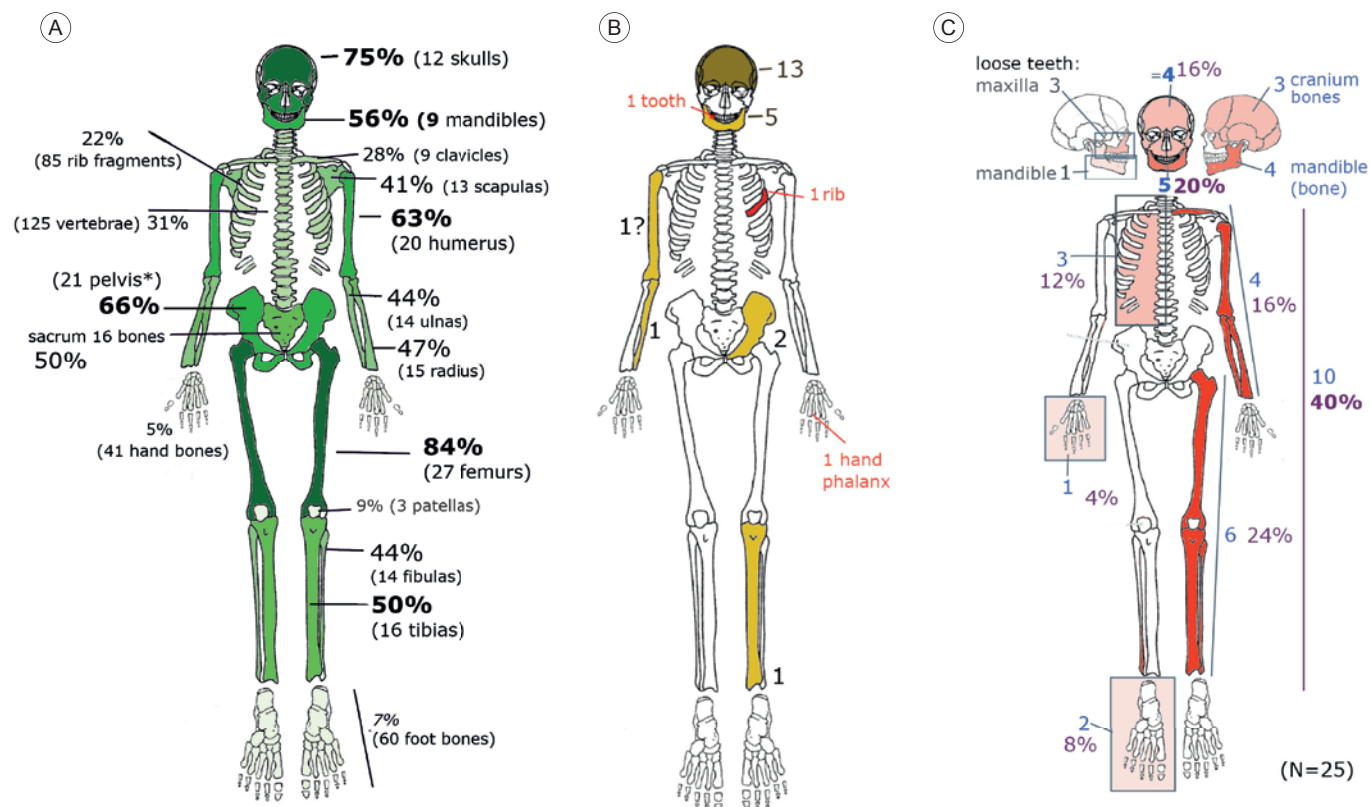


Fig. 6. The anatomical structure of secondary burials versus human remains from trench IV. A – secondary burials represented by more bones; B – secondary burials represented by single bones; C – human remains from trench IV. A – the percentage is calculated from the expected number of bones for a given number of identified individuals; B – unusual bones for this type of burial are marked in red; C – minimum number of bones (25) is used in percentage calculations; skull: on the left side are numbers of maxillae and mandibles based on sets of loose teeth, on the right side is the minimum number of skulls and mandibles based on bone fragments, in the middle is the general minimum number of craniums and mandibles. Author K. Bugajska.

Obr. 6. Anatomické zastoupení sekundárních pohřbů versus lidských pozůstatků ze sondy IV. A – sekundární pohřby zastoupeny větším množstvím kostí; B – sekundární pohřby zastoupeny ojedinělými/jednotlivými kostmi; C – lidské pozůstatky ze sondy IV. A – procentuální zastoupení je vypočítáno z předpokládaného počtu kostí pro daný počet identifikovaných jedinců; B – červenou barvou jsou označeny kosti neobvyklé pro tento typ pohřbu; C – pro procentuální zastoupení je použit minimální počet kostí (25), pro lebku: na levé straně je celkové číslo pro lebku a dolní čelist na základě izolovaných zubů, na pravé straně jsou minimální počty lebek a dolních čelistí na základě fragmentů kostí, uprostřed je obecný minimální počet lebek a dolních čelistí. Autor K. Bugajska.

small concentrations directly on the ground of the cemetery and usually near particular graves or pits. Such deposits were later more or less destroyed and the bones were spread over a larger area of the cemetery (Bugajska 2023).

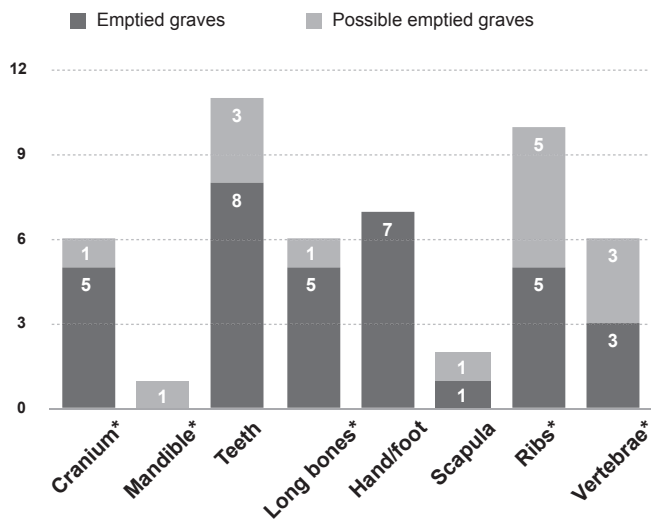
In addition to cremated remains, 952 unburned bone fragments and loose teeth were found. It was possible to match about half of them to particular individuals from graves (Tab. 2), especially those more destroyed by modern ploughing. Graves from the southern and eastern part of the cemetery were generally more damaged in this way. A good example is grave VI-9, which included secondary burials of at least three individuals. Bones ploughed out from graves were heavily fragmented and scattered over a very large area of several square metres (Bugajska, Gumiński 2016, 537–538).

Some of the loose human bones appearing at the cemetery may be remnants of disturbed and emptied graves (Bugajska 2021, 662–665, Tab. 101.1, Fig. 101.4–101.6). Such an interpretation applies to bones found around particular pits along with potential grave goods. In four cases, pit VI-j-2, VI-e-4 and VI-e-3, VI-k/e-2, human bones were also found inside the pit, mostly at its bottom (Fig. 5). All of these structures are consequently interpreted as emptied graves containing the remains of at least four individuals. There could be more emptied graves at the cemetery, because such a scenario seems to be the most probable for the next four individuals determined at the cemetery, but it is difficult to associate bones with a particular pit

(Bugajska 2021, 667, Tab. 101.1, Fig. 101.4). It should be added that small elements like teeth or small bones of the hand or foot are more frequent than pieces of skulls or long bones in the case of emptied graves (Graph 2). Moreover, there are even fragile bones such as vertebrae and ribs (Graph 2). In turn, the skull and long bones, if present, are represented by small fragments. In general, emptied graves include mostly elements of the skeleton that are easily lost and overlooked. It is the opposite anatomical structure as in the case of secondary burials at Dudka, where such elements are usually missing, and big, distinctive and more resilient bones dominate (Fig. 6) (Bugajska, Gumiński 2016; Bugajska 2021).

There are three cases at the cemetery in which human bones found inside pits were interpreted as secondary burials, not emptied graves (Bugajska 2021, Tab. 101.1). Two single human bones found in two pits at the cemetery belong to this group: the whole occipital bone from pit VI-e-2 and a human rib from pit VI-m-1 (Fig. 5). The rib is especially exceptional, because such an indistinct bone as a rib was usually missing in secondary burials (Fig. 6). A third possible secondary burial was probably deposited in pit VI-h-2, next to grave VI-11 and VI-12, because several female bones appeared around the pit, including half of a mandible (Fig. 5: mandible Y).

Single human bones could have been deposited separately on the ground surface of the cemetery, not only in pits. A large number of skull pieces occurring at the cemetery are most



Graph 2. Dudka, cemetery. Anatomical structure of bones from emptied graves.
* Small fragments of bone. Author K. Bugajska.

Graf 2. Dudka, pohřebišť. Anatomické zastoupení kostí z vybraných hrobů.
* Drobné fragmenty kostí. Autor K. Bugajska.

probably the result of this very custom (Bugajska, Gumiński 2016; Bugajska 2021). Cranial fragments were spread over the entire area of the cemetery (Fig. 5). The southern part of the cemetery more destroyed by ploughing consequently yielded more skull pieces. At least seven crania were determined based on the scattered bone fragments. It should be noted that there are three mandibles at the cemetery, though probably none of them belong to distinguished crania (Fig. 5). Loose maxillary teeth were found at the cemetery as well, but it is difficult to associate them with a particular skull. This suggests that skulls, without mandibles, could have been deposited at the cemetery as separate secondary burials. Each cranium deposited directly on the ground surface of the cemetery could have been placed

in close vicinity to a particular grave or pit. However, it is very difficult to estimate their primary location, because pieces of one given skull are scattered over a large area of several square metres (Fig. 5). The same probably applies to the mandibles recorded at the cemetery.

Skulls and mandibles were surely the most distinctive bones, and they could have been used to mark particular graves at the cemetery, all the more so as skulls were placed in some cases at the top of a secondary burial, as in the case of graves VI-1 and VI-16 (Bugajska, Gumiński 2016). However, it is possible that not only skulls and mandibles were deposited in such a way, i.e. on the ground surface of the cemetery, but also long bones or other skeletal elements. It may explain why different human bones are present outside the formal grave context at the cemetery. Moreover, such a practice is also confirmed for a single human tooth, which was undoubtedly intentionally deposited on the cemetery ground surface. The unique secondary deposit of a human tooth was found close to pit VI-k/e-2 (Fig. 6), which was interpreted as an emptied grave. The human molar was intentionally covered with a whole turtle carapace (Fig. 7). Taking into account its stratigraphic position, this unique burial is dated to the end of the classic Zedmar period.

4.2 Periphery of the cemetery – trench IV

Trench IV was located on the island plateau near the main cemetery (Fig. 3). This area was intensively used for settlement purposes in the post-Zedmar – Late Neolithic period. At that time, settlement activity was also recorded for the cemetery area in trench VI. In the Late Neolithic, the funeral zone was moved to another location in the island interior – trench IX (Bugajska 2023). The location of trench IV may suggest that it was probably a periphery of the cemetery ground. It explains why such a small trench yielded so many loose human bones, i.e. 81 fragments of at least 25 bones and eight individuals (Appendix 1). A small number of heavily cremated remains appeared there as well. Eight pieces of white bones probably belong to one individual and may come from a destroyed cremation burial (Bugajska 2023).

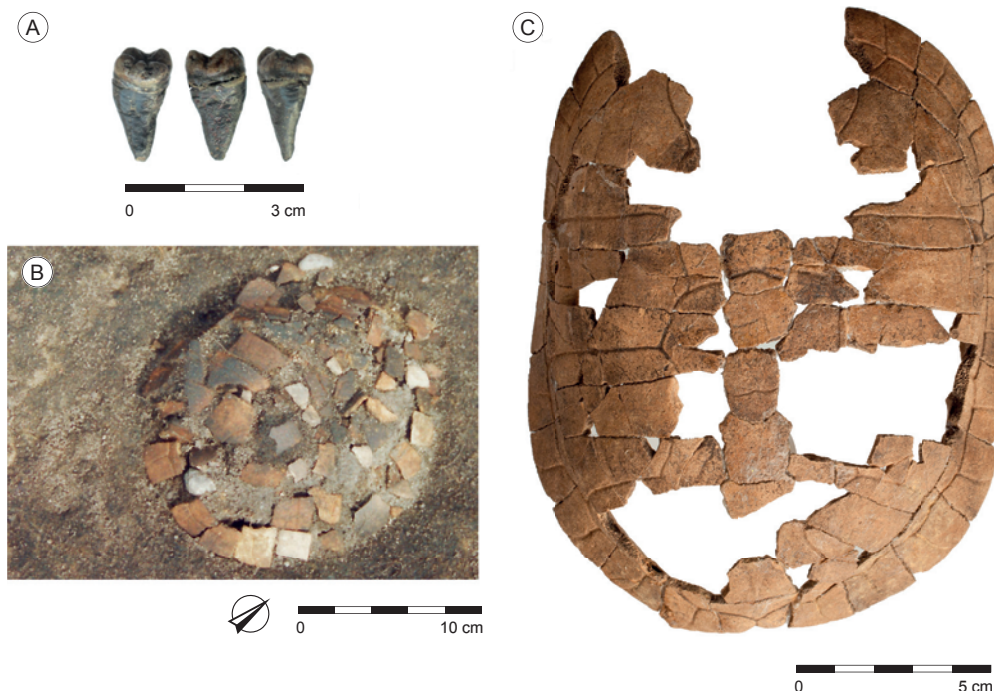


Fig. 7. Dudka, trench VI, main cemetery. Human molar deposit covered with turtle carapace. A – lower human molar (LM3) (photo by K. Bugajska); B – turtle carapace *in situ* (photo by W. Gumiński); C – turtle carapace (photo by M. Bogacki).

Obr. 7. Dudka, sonda VI, hlavní pohřebišť. Depozit lidských molárů překrytý želví krunýřem. A – lidský dolní molár (LM3) (foto K. Bugajska); B – želví krunýř *in situ* (foto W. Gumiński); C – želví krunýř (foto M. Bogacki).

Unburned bones make up two distinct clusters in trench IV. The northern part of the trench yielded bones from at least one postcranial skeleton, pieces of at least one cranium and three or four mandibles: of a child (ind. IV-C) and two or three of adults (ind. IV-B?, IV-D and IV-E) (Appendix 1). Human remains in the southern part of the trench do not make such a distinct cluster. Bones belonging to at least one individual (IV-A) were loosely scattered, and to some extent, remained in anatomical order (Bugajska, Gumiński 2016, 537).

The anatomical structure of human bones from trench IV is similar to the case of secondary burials at Dudka (Fig. 6). It applies especially for the bone cluster in the northern part of the trench. While larger and more resilient bones dominate, they were more or less fragmented. Small bones and teeth are missing. The large number of mandibles found in the 'northern' cluster may suggest a secondary burial as well, because mandibles were very often added as a secondary deposit to the graves at Dudka (Fig. 6B). In the case of the postcranial skeleton from the southern part of the trench (ind. IV-A), bones were less fragmented and in general are mostly long bones. Taking into account their spread, it is possibly a remnant of a destroyed primary burial, rather than a secondary one (Bugajska, Gumiński 2016, 537).

4.3 Eastern bay at Dudka – trench III

The eastern bay, trench III, was one of the main settlement areas at Dudka island and it yielded the largest number of loose human bones. There were 328 bone fragments from at least 82 bones of a minimum of 37 individuals (Tab. 2; Appendix 1). The majority of human bones occurred on the sloping shore up to the littoral zone, but bones were also present on the plateau of the island, which was used directly as an encampment place. Loose human bones were found in different well-dated layers, starting from those affiliated with the Early Mesolithic, i.e. the Boreal period. Consequently, it was possible to match bones to particular periods according to their stratigraphic position. The number of loose human bones as well as their spatial distribution vary in each period.

4.3.1 The Mesolithic

Loose human bones from the Early and Late Mesolithic layers are very scarce (eight bones and teeth) and they belong only to four individuals (Appendix 1). Early Mesolithic human remains appeared very close to the shore line (ind. III-A, III-B) and were accompanied by amber ornaments, whereas bones dated to the Late Mesolithic (ind. III-C and III-D) were found higher up the slope and closer to the pits (Fig. 8A).

The metatarsal of individual III-B is probably the oldest human bone from trench III taking into account its stratigraphic position (Fig. 8: No. 67; 9: d). The bone was found in a layer dated to the transition from the early to late Boreal period. A charcoal from the same layer gave a result of 8430 ± 190 conv. BP (Gd-4583) (Gumiński 1995, 9–13; 1999, 46–48, Tab. 1, 2; 2008, 30–31, 34, Fig. 3). There were no other finds in the layer, except one unique amber adornment which appeared about 2 m to the south of the human bone (Fig. 8A; 9f). The most probable scenario is that the bone came from a temporary burial and the amber adornment was a clothing accessory.

Three teeth of individual III-A, published already as a so-called 'chief burial', are slightly younger than the metacarpal bone (Gumiński 1995, 35; 1999, 48; 2008, 30–31, 34, Fig. 3, 4; Gumiński, Bugajska 2016). The layer in which the remains of individual III-A appeared is dated based on charcoal samples to 8220 ± 120 conv. BP (Gd-6701), i.e. to the late Boreal period (Gumiński 1995, 35–36, Tab. 1, 2; 1999, 46–48, Tab. 1, 2; 2008, 30–31, 34, Fig. 3, 4).

All teeth come from the left side and there were two lower molars (LM2, LM3) and upper premolar (UP1) (Fig. 9: a–c), suggesting the presence of the whole skull, which could previously have lain on its left side. Teeth were found just at the coast line along with possible grave goods (Fig. 8A). There were several animal bones: a red deer rib, a vertebra of a beaver and bones of a small fur-bearing mammal as well as the unique amber adornment, possibly a pendant (Fig. 9: e). All of these finds made up a distinct concentration around the human teeth, and most probably they were deposited at the head of the deceased (Fig. 8A).

Human teeth (ind. III-A) were found so close to the shore line, almost in the littoral zone, so they are most probably a remnant of a washed-out primary or temporary burial, especially since there are traces in the stratigraphy clearly indicating shore damage during strong storms in the late Boreal period (Gumiński 1995, 16–17, 35–37; 1999, 46–47; Gumiński 2008, 34–40). It is not certain, however, whether some of the bones could have been taken away by hunters before or after the burial was washed out, i.e. whether it was just a primary burial or perhaps a temporary one? The deceased was probably turned with the legs to the lake and the head was located at the highest spot. In such a position, it seems very likely that the whole postcranial skeleton was completely washed out by the water along with part of the shore sediment. Such a scenario, however, is not as certain for the skull. There is a complete lack of any cranial bones in the vicinity (Fig. 8A), whereas the whole skull or at least some fragments of it should have appeared at the coast line if it was just destroyed by water. If we take into account the location of teeth, the likely intact position of grave goods and the simultaneous lack of the cranium and mandible, it seems much more probable that the entire skull was taken away. It could have been slightly broken in the facial part, so teeth were lost.

The number of loose human bones is still small in the Late Mesolithic, and the bones and teeth belong to two individuals, one adult 35–40 years of age and one 8–11-year-old child (Appendix 1). The child is represented by a part of the fibula found in the lower part of the slope in the same area where the Early Mesolithic human remains occurred (Fig. 8A: No. 15; 9: j). In this case, no possible grave goods were found, but the bone could have come from a temporary burial. In turn, the remains of an adult, a small fragment of skull (No. 111) and maxillary canine (No. 101) appeared in the upper part of the slope between two pits (Fig. 8A; 9: g, h). An upper premolar (UP2, No. 93) found two metres lower on the slope may belong to this individual as well (Fig. 9: i).

Both Late Mesolithic pits include exceptional deposits (Fig. 8A). The pit uncovered in metre 7E67N was small and in a regular circular shape. It was dated based on charcoal, which gave a result of 7610 ± 55 conv. BP (Ki-5722), indicating the early Atlantic period (Gumiński 1999, 49, Tab. 1). The pit included a weapon deposit of an antler axe and one flint microlith, which could come from a whole arrow (Gumiński 1995, 35, Fig. 9; Gumiński 1999, 49; Gumiński 2008, 30–32, Fig. 3, 4). Second pit was located at the highest point of the slope (metre 6E67N) and had an oval shape (Fig. 8A). It was surrounded by large stones and there were animal bones inside, including a large fragment of an aurochs skull. The inventory of both pits was most likely of a ritual-symbolic character rather than utilitarian. Moreover, both pits were located on the boundary of the encampment zone and the lakeshore used for funeral purposes (Fig. 8A). It cannot be ruled out that the remains of ind. III-D are somehow connected with these deposits. Taking into account that there were only loose teeth and a very small piece of frontal bone, it seems likely that these remains were just lost and could come from temporary burial or alternatively from a skull deposit.

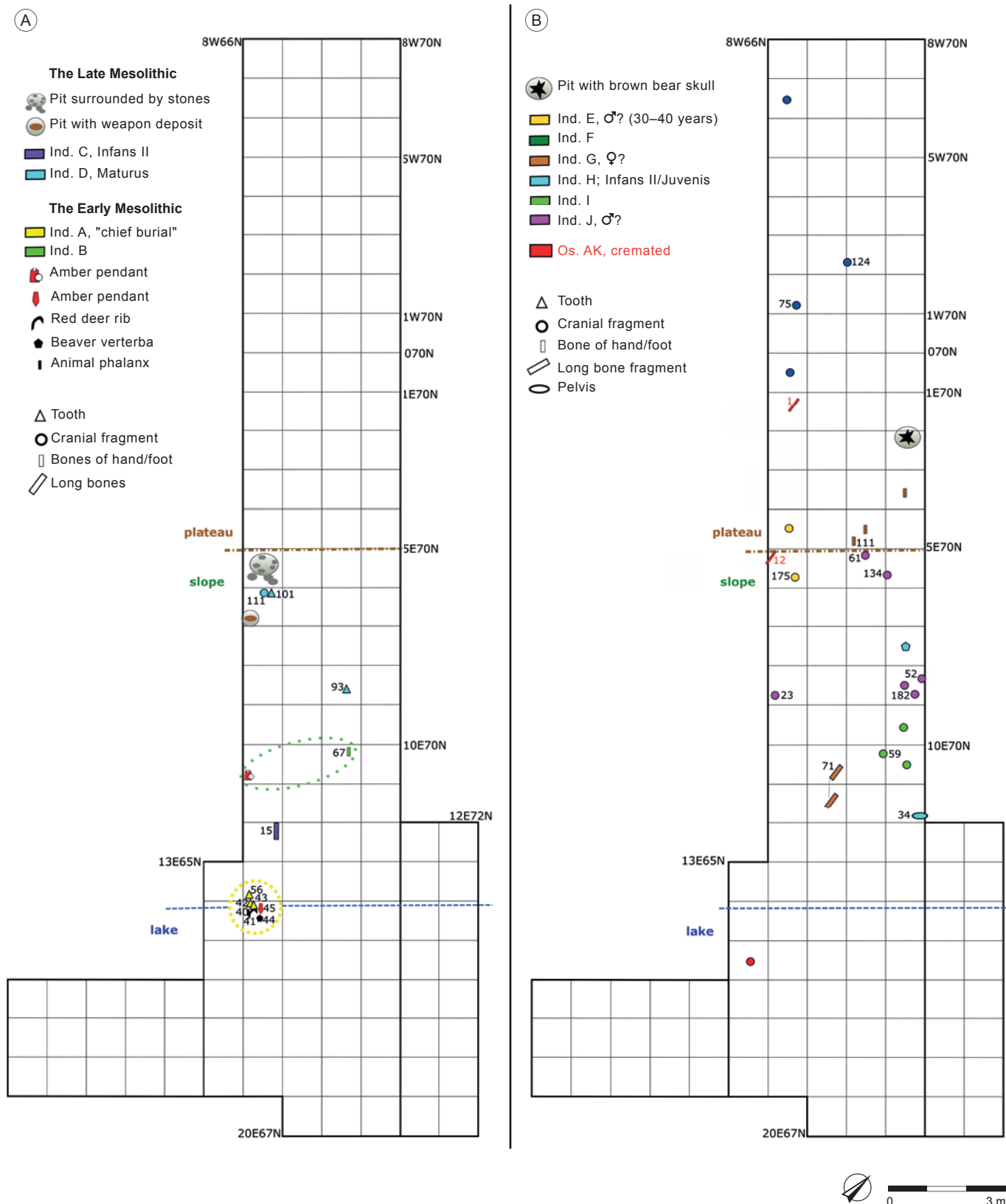


Fig. 8. Dudka, trench III. Distribution of loose human bones. A – Mesolithic; B – early Zedmar. Bones of identified individuals are marked in different colours. Author K. Bugajska.
Obr. 8. Dudka, sonda III. Distribuce izolovaných lidských kostí. A – mezolit; B – časný Zedmar. Kostí identifikovaných jedinců jsou značeny různými barvami. Autor K. Bugajska.

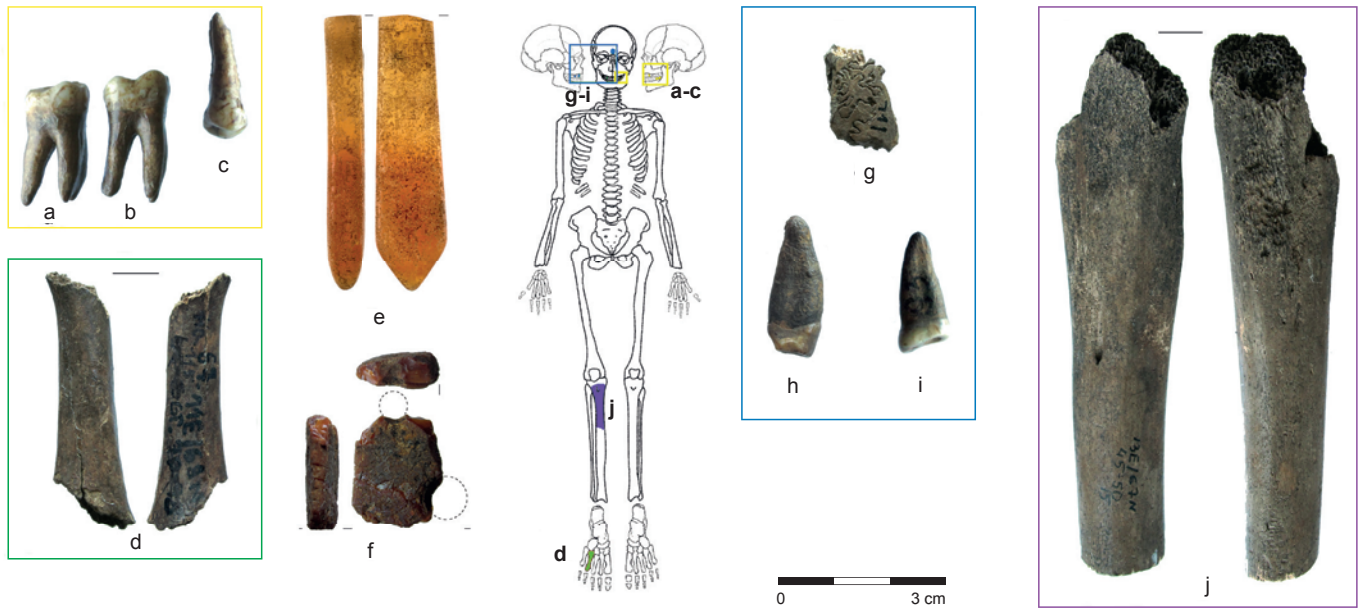


Fig. 9. Dudka, trench III. Human bones and amber ornaments from the Mesolithic layers. a–f – Early Mesolithic; g–j – Late Mesolithic; a–c – individual III-A; a–b – lower molars (LM2, LM3); c – upper premolar (UP1); d – ind. III-B, metatarsal bones; e – amber ornament found with ind. III-A; f – amber ornament found with ind. III-B; g–i – individual III-D, Maturus; g – piece of frontal bone; h – upper canine; i – upper premolar (UP2); j – individual III-C, Infans II, right tibia. Author K. Bugajska.

Obr. 9. Dudka, sonda III. Lidské kosti a jantarové ozdoby z mezolitických vrstev. a–f – časný mezolit; g–j – pozdní mezolit. a–c – jedinec III-A; a, b – dolní moláry (LM2, LM3); c – horní premolár (UP1); d – jedinec III-B, metatarsální kosti; e – jantarové ozdoby nalezené u jedince III-A; f – jantarové ozdoby nalezené u jedince III-B; g–i – jedinec III-D, Maturus; g – fragment čelní kosti; h – horní špičák; i – horní premolár (UP2); j – jedinec III-C, Infans II, pravá kost holenní. Autor K. Bugajska.

4.3.2 Early Zedmar

Human bones in the early Zedmar are more numerous than in the whole Mesolithic; however, it is not distinctly rapid growth. There were 28 bone fragments of at least seven individuals in the early Zedmar layers (Appendix 1). To this group was added a single heavily burned bone of individual III-AK, which was found in the Late Neolithic layer, but it gave a direct radiocarbon date of 5150 ± 29 conv. BP (GrM-30003), indicating the early Zedmar period (Bugajska 2023; 2024).

Bones are present not only on the sloping shore and in the littoral zone of the lake, but also on the island plateau (Fig. 8B). It should be noted, that on the plateau, i.e. at the settled area, cranial fragments appeared almost exclusively and probably belong to one individual III-F (Fig. 8B).

Human remains on the slope create two distinct clusters (Fig. 8B). One concentration was located on the boundary between the plateau and the slope. There were pieces of one male (?) cranium – ind. III-E and three hand bones of a female individual (III-G). One fragment of a burned fibula (ind. III-AK) dated directly to the early Zedmar also appeared in this area (Fig. 8B). The second cluster of human remains was located in the middle part of the slope at metres 8-12E 68-70N. There are fragments of two skulls (ind. III-I and III-J), including one slightly burned (III-J) and postcranial bones of subadult individual III-H (Fig. 8B). It should be taken into account that some bones which appeared lower on the slope could have been moved down from the higher locations on the slope. An example is probably pieces of a long bone of an adult (Fig. 8B: No. 71), which may belong to the same individual as phalanxes located in the upper part of the slope (ind. III-G).

The anatomical structure of human remains on the slope is diversified to some extent. However, pieces of skulls dominate over postcranial bone fragments (Appendix 1). Moreover, it seems that distinguished skulls come from different individuals, i.e.: III-E, III-J, III-I, than postcranial bones which belong

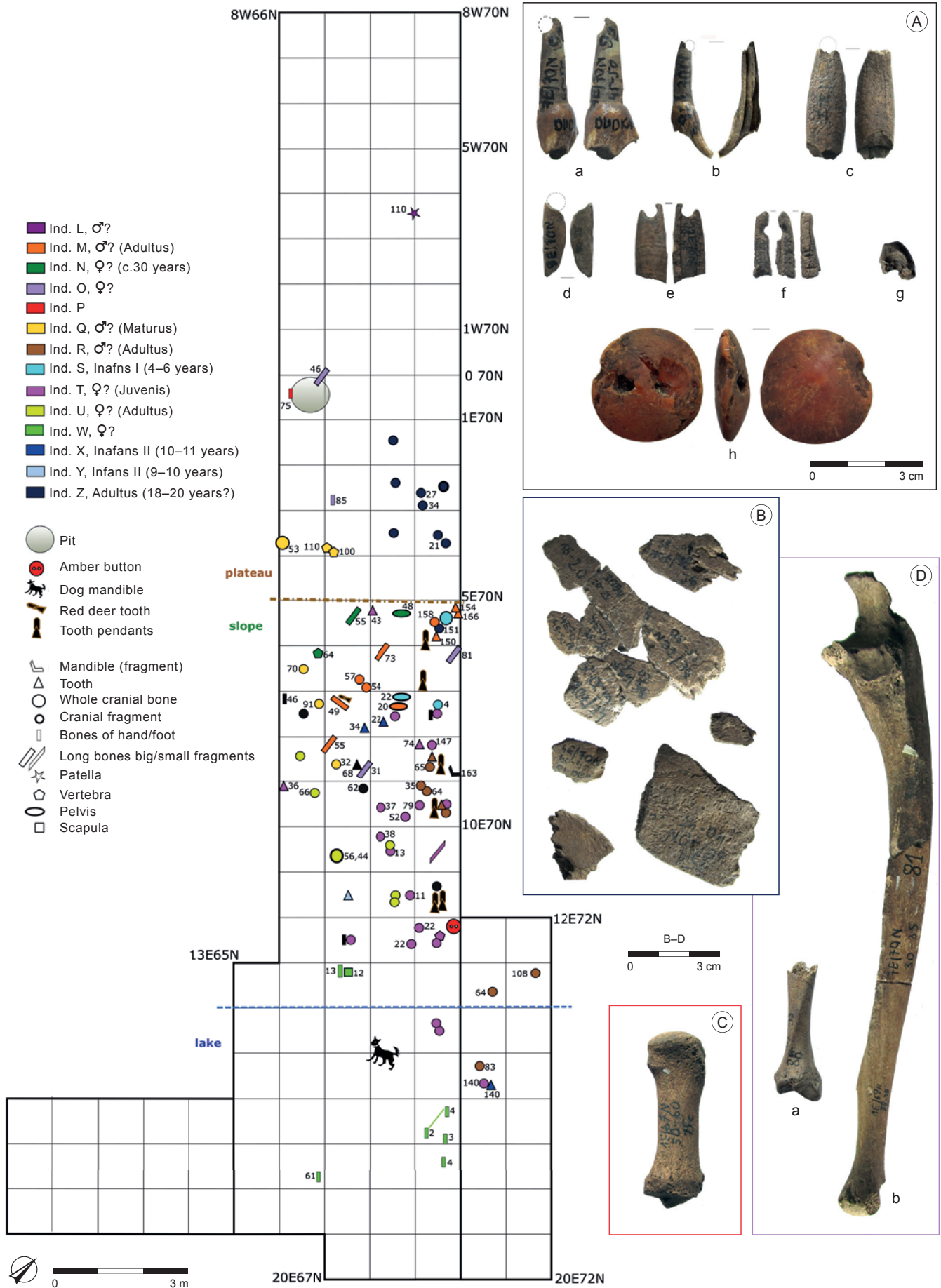
to ind. III-G and III-H (Appendix 1, Fig. 8B). There were no adornments or other possible grave goods which could be connected with human remains.

Considering the spatial distribution of human bones and their anatomical structure it may be stated there is evidence of two different ritual practices: temporary burials and keeping bones of ancestors at the settlement. Temporary burials were probably located at the shore in the middle and higher part of the slope, continuing the practice which was started in the Mesolithic (Fig. 8). Interestingly, hand bones of individual III-G were found near a small pit at the edge of island plateau (Fig. 8B). The pit includes a large part of the brown bear skull and could have similar ritual-symbolic character as pits recorded for the Late Mesolithic, taking into account its inventory and location on the boundary of encampment and temporary burial area. It is possible that bones collected from the temporary burial place were kept at the settlement as a kind of memorabilia. It is suggested by the higher share of cranial pieces in the bone assemblage as well as the presence of skull fragments at the settled area on the plateau.

4.3.4 Classic Zedmar

The occurrence of loose human bones in the classic Zedmar layers grows significantly to 114 fragments, which belong to at least 42 bones and 16 individuals (Appendix 1). The spatial distribution of the bones is as in the early Zedmar period (Fig. 8B, 10). The majority of bones come from the sloping shore, mostly from its upper part. Human bones also appeared on the plateau as well as in the littoral zone, but in both cases they were not numerous (Fig. 10).

As was the case in the Early Mesolithic, loose human bones are accompanied by adornments, mainly animal teeth pendants, but one amber button was found there as well (Fig. 10A). It should be noted that adornments were scattered over the entire length of the slope, and they appeared where the density of loose



human bones is the greatest (Fig. 10). All animal teeth pendants are broken at the hole, as if they were clothing attachments that were damaged and lost (Fig. 10A: a–g).

In general, human remains show a diversified anatomical structure, i.e. all parts of the skeleton are represented, with a large share of small elements including loose teeth (Appendix 1). Moreover, skulls are usually preserved in numerous small bone pieces scattered along the slope (Fig. 10). A similar situation also concerns a female ulna (ind. O) found in three fragments; one (No. 46) lay at the pit on the plateau, whereas two other fragments (No. 31, 81) appeared on the slope at a distance of 5–7 m (Fig. 10D: b). It suggests that remains, especially small bone fragments, moved down the slope even up to the littoral zone.

In addition to small elements and small bone fragments, whole large bones were found as well, i.e. whole or halves of long bones, large parts of the ilium and whole cranial bones such as the occipital and frontal bone (Fig. 11, 12). These bones appeared at the edge of the plateau and at the uppermost part of the slope and belong to at least four individuals – III-Q, III-N, III-M, III-S (Fig. 11). Bones from a particular skeleton remained to some extent in anatomical relation, thanks to which, it was possible to estimate the probable primary position of the body of the deceased (Fig. 12).

The whole occipital bone of individual III-Q was found on the edge of plateau (Fig. 11: No. 53). It lay with its inner part upwards (Fig. 11a). Two thoracic vertebrae were found in the same area ca one metre away from the occipital bone, and they may come from the same individual (Fig. 11: No. 100, 110; 12: b). The position of the bone suggests that it was most probably a temporary burial with the body of the deceased laid on their back (Fig. 12) rather than a skull kept at the settlement.

Single big bones of the next three individuals were found on the uppermost part of the slope (Fig. 11: b–d). There were bones of one female individual III-N – right ilium (No. 48) and right radius (No. 55), which lay at the highest point of the slope in the middle of the excavated area (Fig. 11: b, d, 12: e, f). One thoracic vertebra found ca 1 m lower on the slope may also belong to this individual (Fig. 11: No. 64). In this case, the body could have been placed on the right side and across the slope with the head turned towards the north (Fig. 12).

Two other individuals were probably deposited next to the female, one adult male – ind. III-M and a child in the age of 4–6 years – ind. III-S (Fig. 11, 12). Bodies of both individuals could have been placed next to each other with heads turned towards the settlement area and legs to the lake (Fig. 12). At the highest point, the frontal bone of a child was found (Fig. 11: No. 158; 12: c). Loose teeth and pieces of the skull of an adult, most probably of individual III-M, appeared in the same square metre 6E70N (Fig. 11). The next bones of the male and child lay scattered along the slope in the south-west direction. The left ilium bone of the child (Fig. 11: No. 22; 12: d) was found at a distance of ca 1.5 meter from the frontal bone. In turn, the right radius bone (Fig. 11: No. 73; 12: g) of ind. III-M was found 1 m away from pieces of the male skull. Two large pieces of both male femurs (Fig. 11: No. 49, 55; 12: g, j) appeared lower at a distance of the next 1–2 m from the skull. A fragment of a male pelvis (Fig. 11: No. 20; 12: h) was also found in this area and may

belong to individual III-M. Additionally, a whole tooth of a red deer was found near the left male femur (No. 49) (Fig. 11: c, e). It seems that it was a kind of clothing application, despite being unworked. It is possible that the burials of the child and male have more adornments, because two tooth pendants were found near their bones (Fig. 11, 12), one by their skulls (Fig. 11A: c) and a second near the fragments of their pelvises (Fig. 11A: a).

Whole bones in an anatomical position were also found by the lakeshore. The right scapula and clavicle of one female individual (III-W) lay in an intact anatomical connection (Fig. 10, 11). A group of left metatarsals was found ca 3 m lower in the littoral zone and they belong to the same female. The rest of the skeleton is missing. Taking into account the location of burial, the most possible scenario could be the washing out of bones. On the other hand, however, there were no cranial fragments in the close vicinity of the shoulder bones that can be matched with certainty to this individual (Fig. 10). Most skull pieces from this area belong to the skulls scattered down the sloping shore that were previously located somewhere higher. There is no clear evidence that the skull of individual III-W could have been destroyed by lake waters, all the more because it should lay higher on the lakeshore than intact shoulder bones. This suggests that the skull was most likely taken. The second intriguing issue is the presence of a dog mandible found between the shoulder bones and metacarpals, i.e. right at the place where the postcranial skeleton of the female should be expected (Fig. 11). The dog mandible was preserved in pieces and bone fragments and loose teeth were scattered down over a large area. The question is, how is it possible that the female postcranial skeleton was washed away, but the dog mandible remained in place? It again suggests that most bones were taken rather than being washed away. The remains of individual III-W should be interpreted as the remnants of a temporary burial located near the lakeshore and which was partially destroyed by lake waters. The dog mandible could have been placed by the dead female's chest (Fig. 11, 12).

In conclusion, most of the human remains from the Zedmar layers can be interpreted as remnants of temporary burials lost and overlooked, similar to numerous adornments. The exceptions to this rule are the whole and distinctive bones of several individuals. Such bones are surely too big to be lost, so they were more likely intentionally left. It is intriguing ritual behaviour and perhaps the purpose was to mark this special funeral ground. Temporary burials were placed mostly at the highest point of the slope, i.e. on the edge of settled plateau area, and more rarely just at the lakeshore (ind. III-W). The practice of storage bones at the settlement is possible as well, but it seems to be infrequent. It may concern several postcranial bones found on the plateau and near the settlement pit, ind. III-L, ind. III-P, ind. III-O? (Fig. 10C, D), as well as the fragmented skull of individual III-Z (Fig. 10B).

4.3.5 Post-Zedmar and Late Neolithic

The uppermost layers are more or less mixed and disturbed, making it impossible to separate bones belonging to the post-Zedmar period from those of Late Neolithic provenance. The bone assemblage from the latest layers is comparatively large. It should be added, however, that the fragmentation and post-depositional destruction of bones is strong. As a consequence,

Fig. 10. Dudka, trench III. Classic Zedmar, distribution of loose human bones. A – ornaments: a–c – pendants made of deer teeth; d–g – fragments of tooth pendants; f – pendant ornamented with incisions; h – amber button; B – skull of individual Z; C – individual III-P (male), left metatarsal; D – individual III-O (female), a – right metacarpal, b – left ulna. Author K. Bugajska.

Obř. 10. Dudka, sonda III. Klasický Zedmar, distribuce izolovaných lidských kostí. A – ozdoby: a–c – přívěšky ze zubů vysoké zvěře/jelena; d–g – fragmenty přívěšků ze zubů; f – přívěšek zdobený zářezy; h – jantarový knoflík; B – lebka jedince Z; C – jedinec III-P (muž), levá metatarsální kost; D – jedinec III-O (žena), a – pravá metakarpální kost; b – levá kost loketní. Autor K. Bugajska.

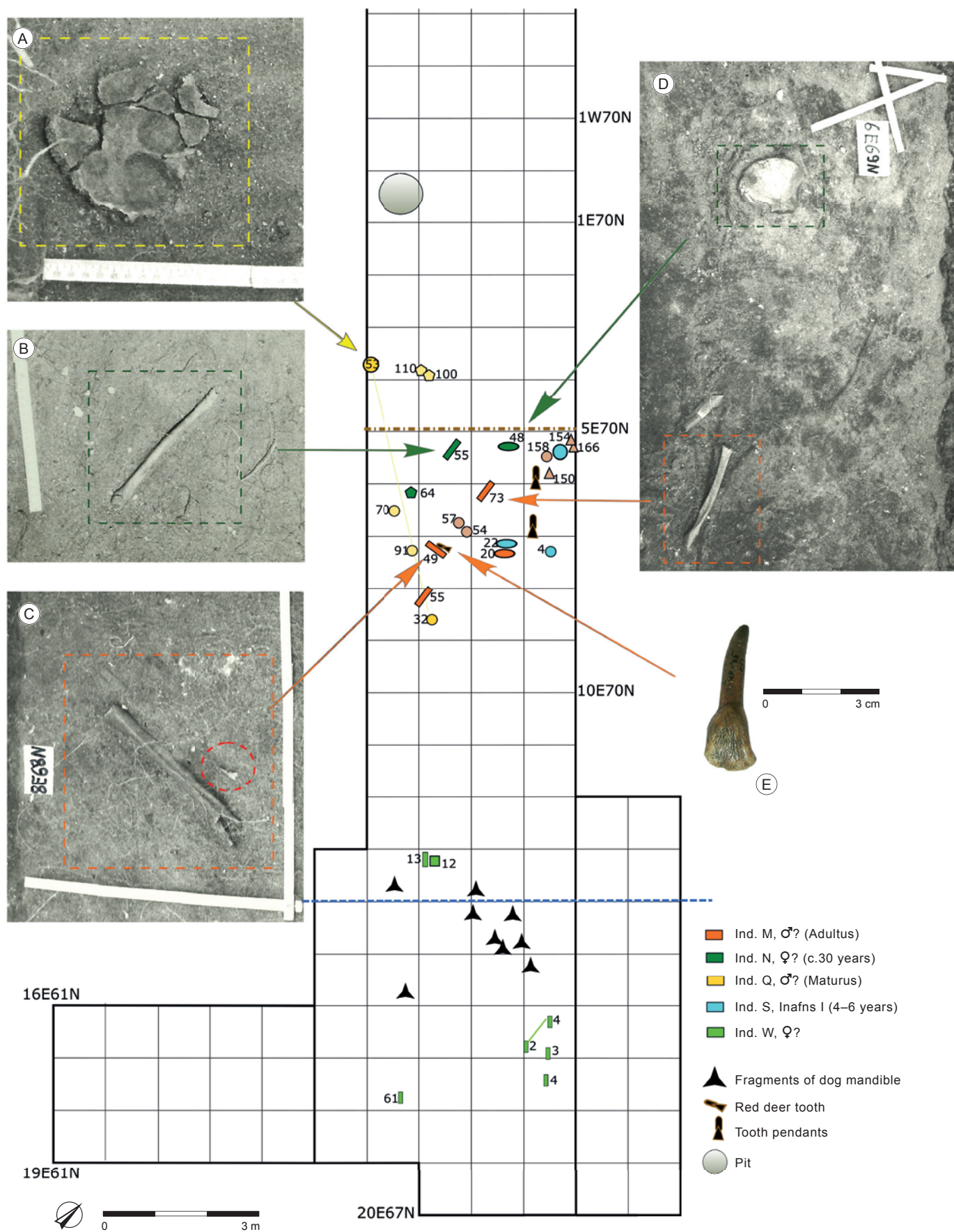


Fig. 11. Dudka, trench III. Classic Zedmar, whole human bones found *in situ*. a – occipital bone of ind. III-Q (male?); b – right radius bone of ind. III-N (female); c – left femur of ind. III-M (male) along with whole red deer tooth; d – pelvis of ind. III-N and radius bone of ind. III-M; e – red deer tooth. Photo by W. Gumiński, compiled by K. Bugajska.

Obr. 11. Dudka, sonda III. Klasický Zedmar, kompletní lidské kosti nalezené *in situ*. a – kost týlní jedince III-Q (muž?); b – pravá kost vřetenní jedince III-N (žena); c – levá kost stehenní jedince III-M (muž) spolu s kompletním zubem jelena; d – kost pánevní jedince III-N a kost vřetenní jedince III-M; e – zub jelena. Foto W. Gumiński, compiled by K. Bugajska.

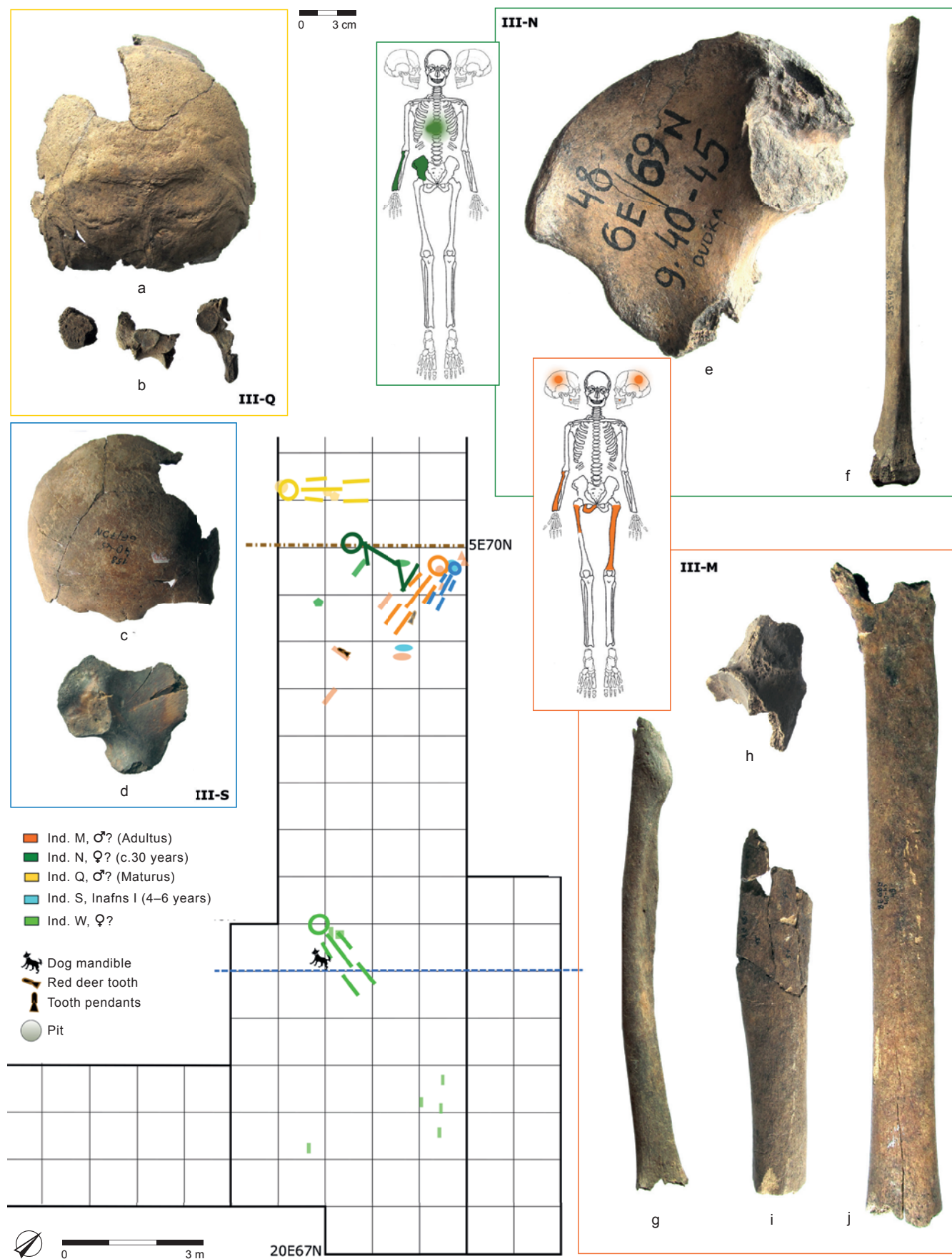


Fig. 12. Dudka, trench III. Reconstruction of body position in temporary burials. a–b – ind. III-Q (male?); c–d – Ind. III-S, 4–6 years old; e–f – Ind. III-N, female, ca 30 years old; h–j – ind. III-M; a – occipital bone; b – thoracic vertebrae; c – frontal bone; d – left ilium; e – right ilium; f – right radius; h – fragment of pelvis; g – right radius; i – right femur; j – left femur. Author K. Bugajska.

Obr. 12. Dudka, sonda III. Rekonstrukce polohy těla u dočasných pohřbů. a, b – jedinec III-Q (muž?); c, d – jedinec III-S, věk 4–6 let; e, f – jedinec III-N, žena, věk zhruba 30 let; h–j – jedinec III-M; a – kost týlní; b – hrudní obratel; c – kost čelní; d – levá kost kyčelní; e – pravá kost kyčelní; f – pravá kost vřetenní; h – fragment kosti pánevní; g – pravá kost vřetenní; i – pravá kost stehenní; j – levá kost stehenní. Autor K. Bugajska.

the number of bone fragments is higher than for the classic Zedmar – 178 bone pieces to 114, but the estimated minimum number of bones is lower – 22 bones to 42, as is the number of individuals 11 to 16 (Appendix 1).

A significant change in the spatial distribution of loose human bones can be observed. The vast majority of the remains were found on the island's plateau, which was used for encampment (Fig. 13). Moreover, almost all of the bone fragments from the slope are fitted to the bones from the encampment area, so they just moved down the slope as a result of post-depositional processes. Exceptions from this rule are scarce. One of them is the cranium of individual III-AH (Fig. 14: r–w). Its primary location was the highest point of the slope, but cranial fragments were spread out over a distance of 11 m up to the littoral zone (Fig. 13).

The anatomical structure of bones is also different than in previous periods (Appendix 1). Skull pieces clearly dominate. At least nine skulls were distinguished, based on bones and maxillary teeth, but postcranial bones belong mostly to one male individual III-AD (Appendix 1). This male postcranial skeleton is represented by long bones only: almost the entire right femur, pieces of the left femur, both tibias and left ulna (Appendix 1; Fig. 14). A whole frontal bone and one upper molar tooth from the plateau may belong to this individual, too (Fig. 13, 14: o, p). Small postcranial bones were scarce in the upper layers (Appendix 1) and all of them appeared at the slope and are unmatched to a particular individual (Fig. 13; Appendix 1).

It should be noted that loose teeth are less numerous than in the classic Zedmar period and they comprise a smaller share in total bone fragment numbers (Appendix 1). Moreover, only two teeth can be matched to particular skulls, one to individual III-AD and the second to individual III-AH (Appendix 1). One human tooth, ind. III-K, was found in the settlement pit, where two teeth of a dog were also found (Fig. 13). Two other sets of teeth belong to subadult individuals: three teeth to child in the age range of 2.5–4 years (III-AG) and one to an older child (ind. III-AF) to which two postcranial bones were also matched (Appendix 1). It is worth mentioning that mandibles are almost not represented, because there was only one very small fragment of the mandibular bone and all teeth are maxillary, except one lower tooth of a child – ind. III-AG (Appendix 1).

The preservation and completeness of particular skulls is diversified (Fig. 13B, 14). Two skulls are represented by whole cranial bones – ind. III-AC and III-AD (Fig. 14: a–j, o, p). In both cases skulls were, however, more or less broken into pieces, but it was possible to reconstruct them. The next three skulls are represented by numerous pieces from different cranial bones – III-AJ, III-AI, III-AH (Fig. 14: k–n, s–w). One cranium of individual III-AB, is represented only by a couple of fragments that are poorly preserved (Fig. 13B). And finally, there were pieces of one burned skull, which come from a cremation burial (Fig. 13; Appendix 1).

Taking into account the location of bones and the domination of large distinctive bones such as the cranium, it could be stated that there is more evidence of keeping bone memorabilia at the encampment than of temporary burials. The storage of bones of the dead concerns mostly crania. Mandibles were previously separated from them and they were taken to another place, maybe to the cemetery, because they are often present in secondary burials, even as single bones of a given individual (Fig. 6A, B). Additionally, almost all maxillary teeth were already lost, most probably at the temporary burial place.

If temporary burials were still deposited at the eastern bay in the post-Zedmar period, they were extremely rare and exceptional. This interpretation seems possible only for a few postcranial bones found exclusively on the sloping lakeshore and

maybe for the one subadult individual III-AG, because one tooth (No. 10) of the child lay near the coastline (Fig. 13). Additionally, some adornments were found on the slope, but in the area where human bones are not so numerous (Fig. 13). However, it should be taken into account that bones and animal tooth pendants which appeared at the slope may come from higher spots and even from older layers.

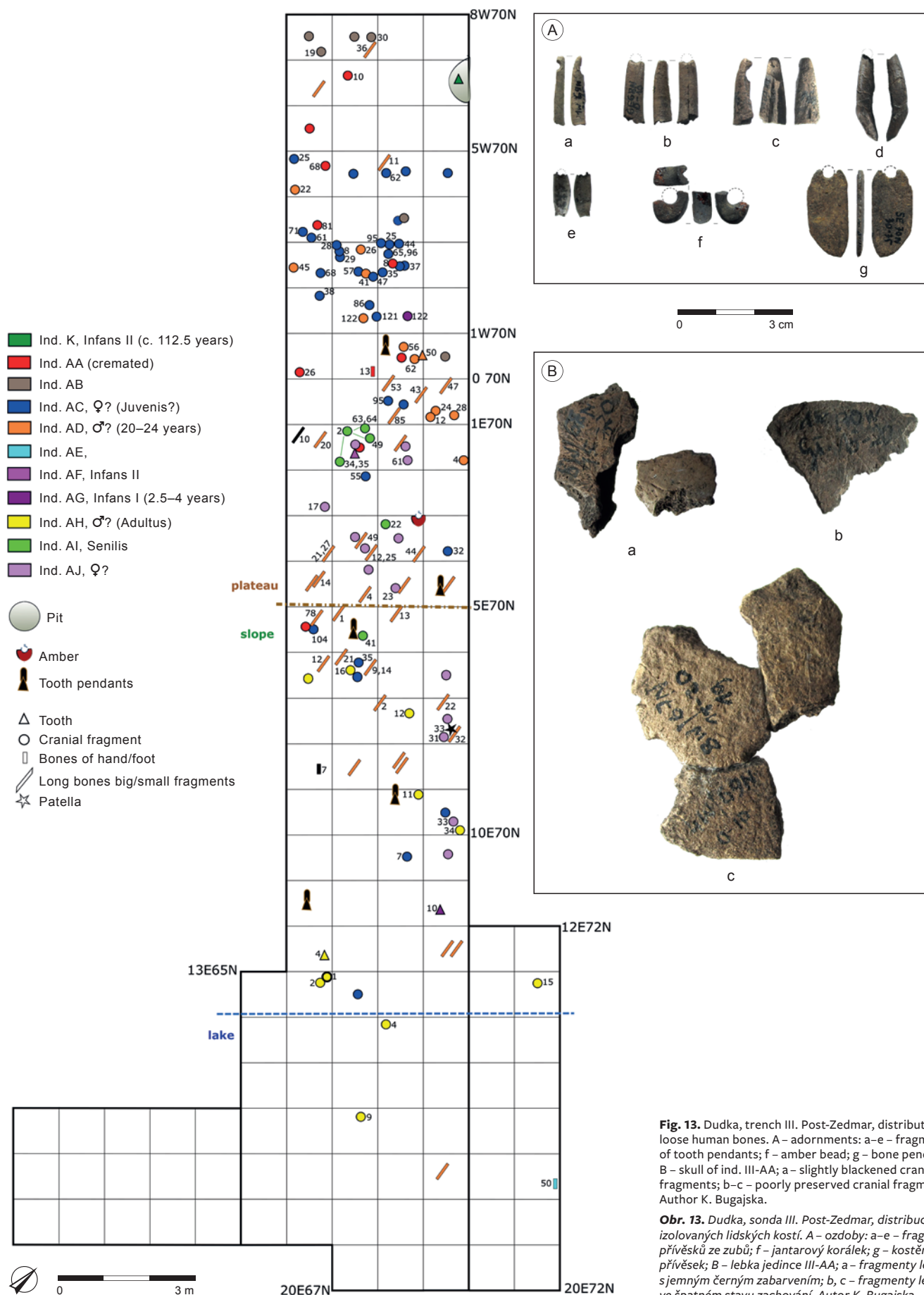
It is difficult to state precisely when the practice of temporary burials was abandoned at the eastern bay. According to the stratigraphy, it most probably happened at the transition from the classic Zedmar to post-Zedmar period, i.e. at the same time the main cemetery was also abandoned (Bugajska 2023, 129–130). It is also difficult to estimate how long the custom of skull storage at the encampment area was practiced. It is not clear if bones were kept until the end of the Late Neolithic, or only in the post-Zedmar period. Direct radiocarbon dates are needed to establish the chronology of this custom.

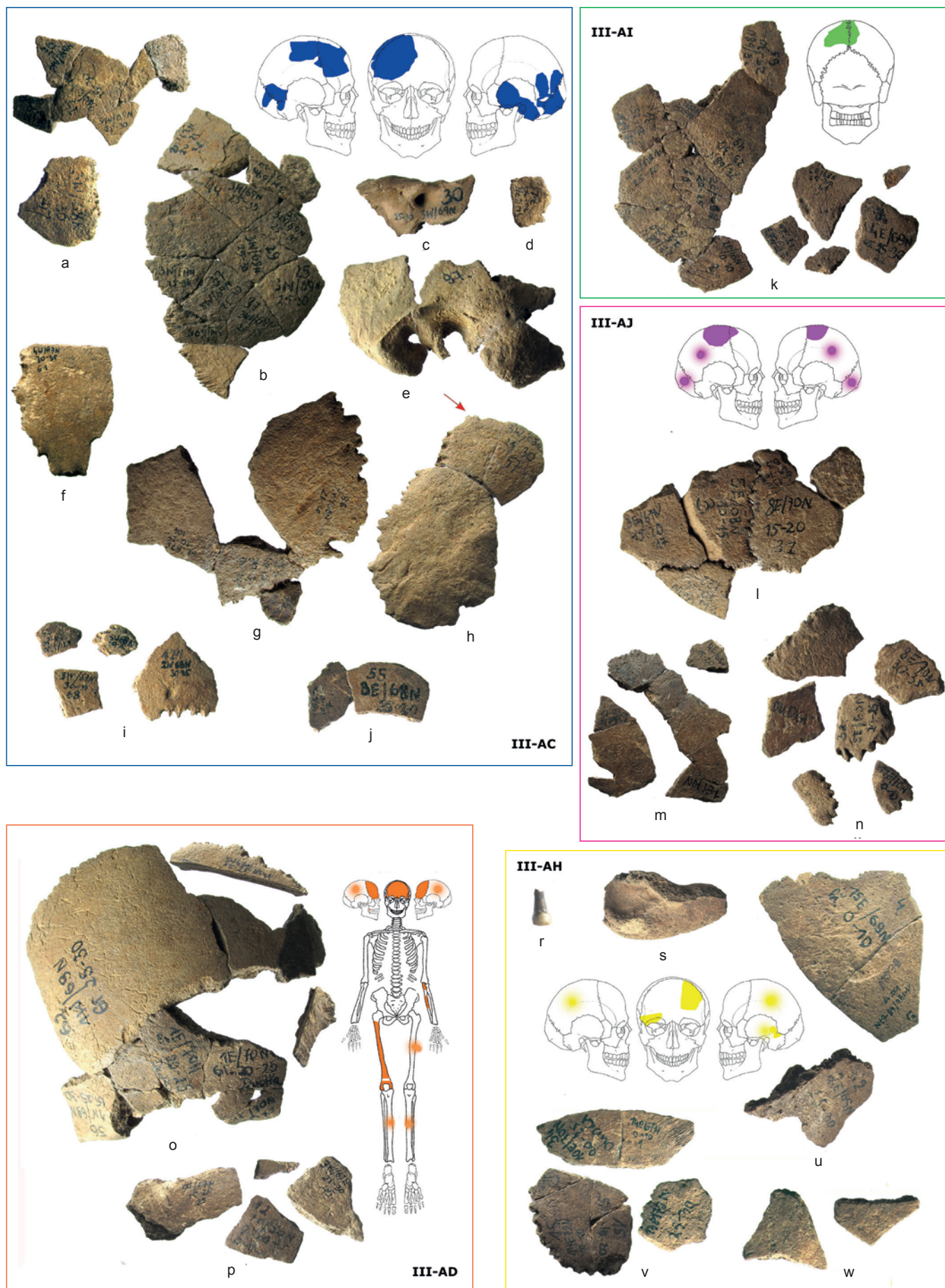
4.4 Dudka – southern promontory – trench I, II and XII

The second main occupation zone was located on the southern promontory on Dudka island. The encampment area was uncovered in trench I. Trench II was very small and located on the flat shore at the very southern end of the promontory. Trench XII was located to the north of trench I and comprised exclusively the littoral zone (Fig. 3). Human bones were found mostly in trench I in the classic Zedmar and post-Zedmar layers (Appendix 1). There were 51 bone fragments of at least 14 bones. Eight individuals were determined based on these materials (Fig. 15; Appendix 1). The assemblage also included heavily burned bones, but they were not numerous. There were only four burned bone fragments which may belong to one individual I-H (Fig. 15; Appendix 1). From trench II come only two bones from two individuals: a cranial bone fragment of an adult and the rib of a child. In turn, trench XII yielded only nine cranial fragments of two individuals (Appendix 1) (Bugajska, Gumiński 2016).

Bones in trench I were found exclusively on the plateau, i.e. the area intensively used for settlement purposes (Fig. 15). Cranial fragments clearly dominate over postcranial bones. At least eight skulls and only two postcranial skeletons were determined (Appendix 1). One of them belongs to individual I-D represented by a heavily fragmented femur shaft and two phalanges (Fig. 16). A heavily burned phalanx and a piece of vertebra belong to the second postcranial skeleton of individual I-H (Appendix 1). Loose teeth occurred rarely, especially maxillary ones. There were barely seven loose teeth, including only two maxillary specimens which could be matched to particular skulls – ind. I-C and ind. I-D (Appendix 1). Mandibles are represented only by loose lower teeth (at least three), which belong to three subadult individuals in different ages (ind. I-A, I-B, I-E). It should be added that all cranial bones, except one fragment of child individual I-A, belong to adults (Appendix 1).

The clear dominance of skulls combined with the presence of only one large and characteristic long bone, i.e. the femur, indicates that selected remains of the deceased were kept on the plateau of the southern foreland. Additional evidence of this practice is the lack of maxillary teeth, which were lost, probably at the temporary burial place. The mandibles were separated from the skulls and taken to another place, most likely to the grave at the cemetery. This rule applies to adult individuals, but probably not to children, because subadult individuals are represented only by loose teeth, mostly mandibular (Appendix 1). There are deciduous as well as permanent teeth, so they come from mandibular bones rather than having been lost during the child's life. It seems possible that mandibles could have been kept at this





settlement area as well, but only in the case of children. The presence of single heavily burned remains suggests that cremated remains collected from the funeral pyre were probably occasionally brought to the encampment as well (Bugajska 2023).

Many fragments of skulls as well as femurs of ind. I-A, were randomly singed and blackened, indicating unintentional exposure to fire (Fig. 16). Moreover, cranial bones are preserved in very small pieces and none of them could be reconstructed (Fig. 15, 16: a). There are barely 1–7 fragments for each distinguished skull (Appendix 1). The same concerns the femur of individual I, which was partially reconstructed, though from many small pieces (Fig. 16: b). The surface of most bones is also more or less eroded. It seems possible that human bones from trench I belong to skulls or long bones kept at the settlement and they finally broke into pieces, after which the bone fragments were trampled for a long period of time and randomly scattered over the settlement. It cannot be ruled out that the bones are older than the layers in which they were found. Unfortunately, partial burning, fragmentation and poor preservation of bone material render direct radiocarbon dating impossible.

If deposited on the southern promontory at Dudka, temporary burials could have been made at the southernmost part of the shore, as is indicated by the presence of human bones in trench II (Fig. 3). There were only two bones, but the excavated area is very small. It is important, however, that there are scarce traces of settlement activity (Gumiński 1999). Temporary burials would therefore be deposited on a flat area just at the shoreline of the lake and away from the encampment zone.

4.5 Szczepanki

The Szczepanki site yielded 55 fragments of human bones, including only one small piece of heavily burned cranium (Appendix 2). Bones come from the 'S' and 'E' sectors at the main settlement located on the southern and south-eastern shore of the island (Fig. 4). Human bones were not present in the eastern foreland – sector 'A', where another smaller encampment was located, which was occupied mostly in the Para-Neolithic period (Gumiński 2012).

4.5.1 Sector 'S' – encampment area

Sector 'S' was located higher up the hill and was used directly for encampment purposes. The oldest trace of occupation of this area falls into the Late Paleolithic. However, the most intensive settlement activity occurred in the Para-Neolithic period, i.e. the Zedmar culture (Gumiński 2004; 2012; Gumiński, Bugajska 2023). Three settlement structures were uncovered there (Fig. 17). Structure 3 is affiliated to the early Zedmar and is probably contemporary to the grave S-1, while Structure 1 is a dwelling hut from the classic Zedmar period. The third pit is probably dated to the transition from the classic to the post-Zedmar period (structure 2) and it has an atypical form difficult for exact interpretation. The pit was narrow, long and very deep, cutting through numerous layers up to the very compact shoal of gravel and stones. The structure includes a very rich settlement inventory, and it seems to be of a kind of utilitarian character, but it was probably not a dwelling hut.

Sector 'S' yielded 28 fragments of human bones and loose teeth belonging to at least 12 individuals (Fig. 17; Appendix 2). The anatomical structure of this bone material is very intriguing, because there are mostly loose human teeth, which were the main basis for MNI estimation (Appendix 2). Apart from the teeth, there were only five cranial pieces, including one cremated, two small fragments of long bones (fibula and radius) and three hand bones (Fig. 17; Appendix 2). The only larger and distinctive bone is the whole mandible found in structure 2. The mandible was found in pieces, but it was possible to reconstruct (Fig. 18). It should also be added that it is the only human bone clearly connected with the settlement pit at the site.

All loose human bones from sector 'S' were found in the north-western part of the excavated area near structure 2, regardless of their exact stratigraphic position (Fig. 17). The only exception to this rule is one hand phalanx found closer to the shoreline in the south-eastern edge of the trench, which is also the edge of the encampment area (Fig. 4, 17). The phalanx comes from the early Zedmar layer along with the bones of a dog and a stone adornment (Fig. 17b), which could be burial inventory.

The oldest bones found in close proximity to structure 2 probably come from the Mesolithic – ind. S-XI and S-VII, because they were found in layers without ceramics (Fig. 17; Appendix 1). Unfortunately, it is not possible to date this material more precisely. A cremated piece of skull (ind. S-VII) was found just below the structure 2, so its Mesolithic provenance is not very clear and the fragment is too small to be directly dated. In turn, the tooth of individual S-XI was found in an area without any typical forms of artefacts and suitable material for radiocarbon dating.

Human remains found in the early Zedmar and classic Zedmar layers were mostly located roughly 2 m from structure 2 to the south (Fig. 17). A pendant made of a dog canine tooth (Fig. 17: c) and the whole paw of a wolf occurred in this area as well. They were placed very close to each other, so it could be one intentional deposit probably dated to the early Zedmar period (Fig. 17). It is possible that this unique deposit is connected somehow with human remains.

The latest human remains may be affiliated with the post-Zedmar or Late Neolithic (Appendix 2). However, this chronology should be taken with some caution. Remains of at least two individuals appeared directly at structure 2 (ind. S-II, S-VI), so it is possible that they come from earlier layers destroyed by pit digging (Fig. 17). Moreover, the latest layers of sector S are more or less mixed and a lot of surely older finds occurred there, especially small flint artefacts, which probably moved down the slope and come from older layers (Gumiński 2004). Such a scenario is also not ruled out for loose human teeth. On the other hand, loose teeth from individuals S-III and S-VIII appeared exactly in the same area as bones in the earliest layers, i.e. at a distance of a couple of metres to the south of structure 2 (Fig. 17).

The domination of small elements, especially teeth, in loose human bone assemblages suggests that there are mostly remains of temporary burials that were lost (Appendix 2). In turn, the lone whole and distinctive bone, i.e. the mandible from structure 2, should be interpreted as evidence of storage of ancestor bones at the settlement (Fig. 17, 18). One piece of the mandible

Fig. 14. Dudka, trench III. Post-Zedmar, skulls of different individuals. a–j – ind. III-AC, female, Juvenis; k – ind. III-AI, Senilis; m–n – ind. III-AJ, female; o–p, ind. III-AD?, male, 20–24 year old; r–w – ind. III-AH, male, Adultus? a – right parietal bone; b – frontal bone; c – pars petrosa, left; d – left temporal bone; f – right parietal bone; g–h – left parietal; j – occipital bone; k – parietal bones; l – frontal and parietal bones; m – fragments of occipital bone; n – fragments of parietal bones; o – frontal bone; p – parietal bones; r – mandibular tooth; s, t – frontal bone; v – parietal bones; u – left temporal bone; i, w – unidentified fragments. Author K. Bugajska.

Obr. 14. Dudka, sonda III. Post-Zedmar, lebky různých jedinců. a–j – jedinec III-AC, žena, Juvenis; k – jedinec III-AI, Senilis; m, n – jedinec III-AJ, žena; o, p – jedinec III-AD?, muž, věk 20–24 let; r–w – jedinec III-AH, muž, Adultus? a – pravá kost temenní; b – kost čelní; c – kost skalní, levá; d – levá kost spánková; f – pravá kost temenní; g, h – levá kost temenní; j – kost týlní; k – kosti temenní; l – kost čelní a temenní; m – fragmenty kosti týlní; n – fragmenty kosti temenní; o – kost čelní; p – kosti temenní; r – zub dolní čelisti; s, t – čelní kost; v – kost temenní; u – levá kost spánková; i, w – neidentifikované fragmenty. Autor K. Bugajska.

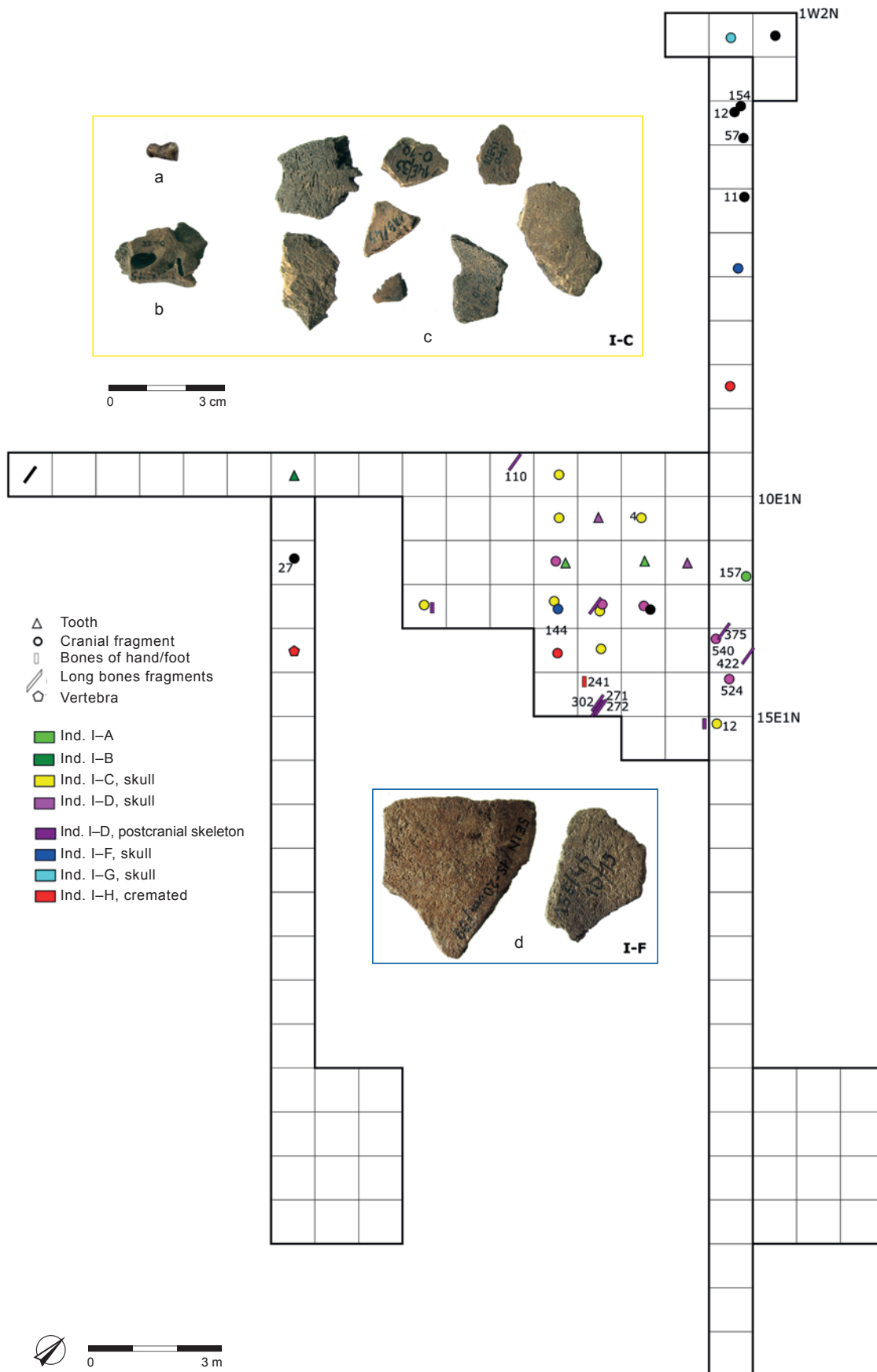


Fig. 15. Dudka, trench I. Distribution of loose human bones. a–b – skull of individual I-C: a – upper molar; b – pars petrosa; c – cranial fragments; d – skull of individual I-F (adult, male?). Author K. Bugajska.

Obr. 15. Dudka, sonda I. Distribuce izolovaných lidských kostí. a, b – lebka jedince I-C: a – horní molár; b – kost skalní; c – fragment lebky; d – lebka jedince I-F (dospělý, muž?). Autor K. Bugajska.



Fig. 16. Dudka, trench I. Bones of individual I-D. a – visibly blackened cranial fragments; b – left femur, singed; c – cranial fragment; d, e – tooth fragments; f, g – hand phalanges; h – fragments of long bone, singed. Author K. Bugajska.

Obr. 16. Dudka, sonda I. Kostí jedince I-D. a – fragment lebky s viditelným černým zbarvením; b – levá kost stehenní, spálená; c – fragment lebky; d, e – fragmenty zubu; f, g – prstní články ruky; h – fragmenty dlouhých kostí, spálené. Autor K. Bugajska.

appeared outside the pit at a distance 1.5 m, but most probably due to the activity of burrowing animals (Fig. 17). It should be ruled out that the mandible comes from a destroyed older grave, because more different human bones should be expected in such cases, as was recorded in trench IV at Dudka.

Temporary burials were deposited directly at the settlement, similar to primary burials of small infants (Fig. 17). However, they were deposited in a very limited area in the western part of the trench. This practice probably began in the Mesolithic period and continued until the end of classic Zedmar, perhaps even longer. Moreover, grave S-2 (probably from the Late Paleolithic) was uncovered in the same area too. It seems that this zone was traditionally used for funeral purposes for a long time. A second possible area where temporary burials could have been deposited is the southern shore, where one human phalanx was found. It seems, however, that this location was rarely chosen, possibly only in the early Zedmar period.

An unclear case is the *pars petrosa* (No. 683) of a newborn infant (ind. S-IV) found in the westernmost location in the trench (Fig. 17a). The size of the bone suggests that it could even have been a prematurely born infant. It is possible that the child was deposited there with its mother, and then their bones were collected, but no adult bones were found in the closest vicinity. On the other hand, the *pars petrosa* is the most solid bone in a fragile infant skeleton, so it is possible that there was a third primary burial of a newborn infant at the site that is just poorly preserved. No traces of a pit were found, but a fossil that could be a grave good or clothing application appeared close to the child bone (Fig. 11). Moreover, children younger than 1.5 years old are not present at the Dudka cemetery. Burials of such small babies come only from the Szczepanki site, where the children probably died (Bugajska, Gumiński 2016; Gumiński, Bugajska 2016). It seems that the small infants were treated in different ways and the multi-step burial rite did not apply to them. The *pars petrosa* was found in a transition layer of the early and classic Zedmar, so it is a slightly later burial than grave S-1.

4.5.2 Sector 'E'

Sector 'E' covering the shore slope and the littoral zone (Fig. 4) yielded 27 fragments of bones belonging to at least 10 individuals (Appendix 2). Most of the bones come from the early and classic Zedmar layers (Fig. 19; Appendix 2). Only one skull fragment (ind. E-VI) can be dated to the Late Mesolithic, four bone fragments to the post-Zedmar or Late Neolithic (Appendix 2).

Human remains occurred mostly in the north-western part of the trench, i.e. at a distance of several metres from the shoreline (Fig. 19). Such a location applies to each layer with human bones, i.e. from the Late Mesolithic to the Late Neolithic. However, the latest remains, post-Zedmar and Late Neolithic, appeared at the highest spot and at a greater distance from the shoreline than bones from the earlier periods (Fig. 19). Only single bones appeared directly on the shoreline (Fig. 19) – a mandible of individual E-II on the eastern part of the shore (Fig. 19: a) and single loose tooth and one hand phalanx in the southern part of the trench (Fig. 19: No. 2, 905).

Small elements are common in the human bone assemblage (Appendix 2), i.e. loose teeth and phalanges. Skulls are represented by single small cranial fragments, as is the case in sector 'S'. At least six crania were determined based on 10 bone fragments found in different layers (Fig. 19; Appendix 2). All loose teeth are maxillary and most of them can be matched to cranial fragments from the same layers. It should be noted that teeth are less frequent there than skull pieces, so it is the opposite tendency seen in sector 'S' (Appendix 2). Only one mandible represented by a set of five teeth (from I1 to P2) and a piece of bone with alveoli for molars was found in sector 'E' (Fig. 19: a), but it is not connected with any determined crania. There were six postcranial bones: two hand phalanges (ind. E-X), three whole long bone shafts (ind. E-I) and one long bone fragment (ind. E-VII). The number of postcranial elements is similar to sector 'S' (Appendix 2).

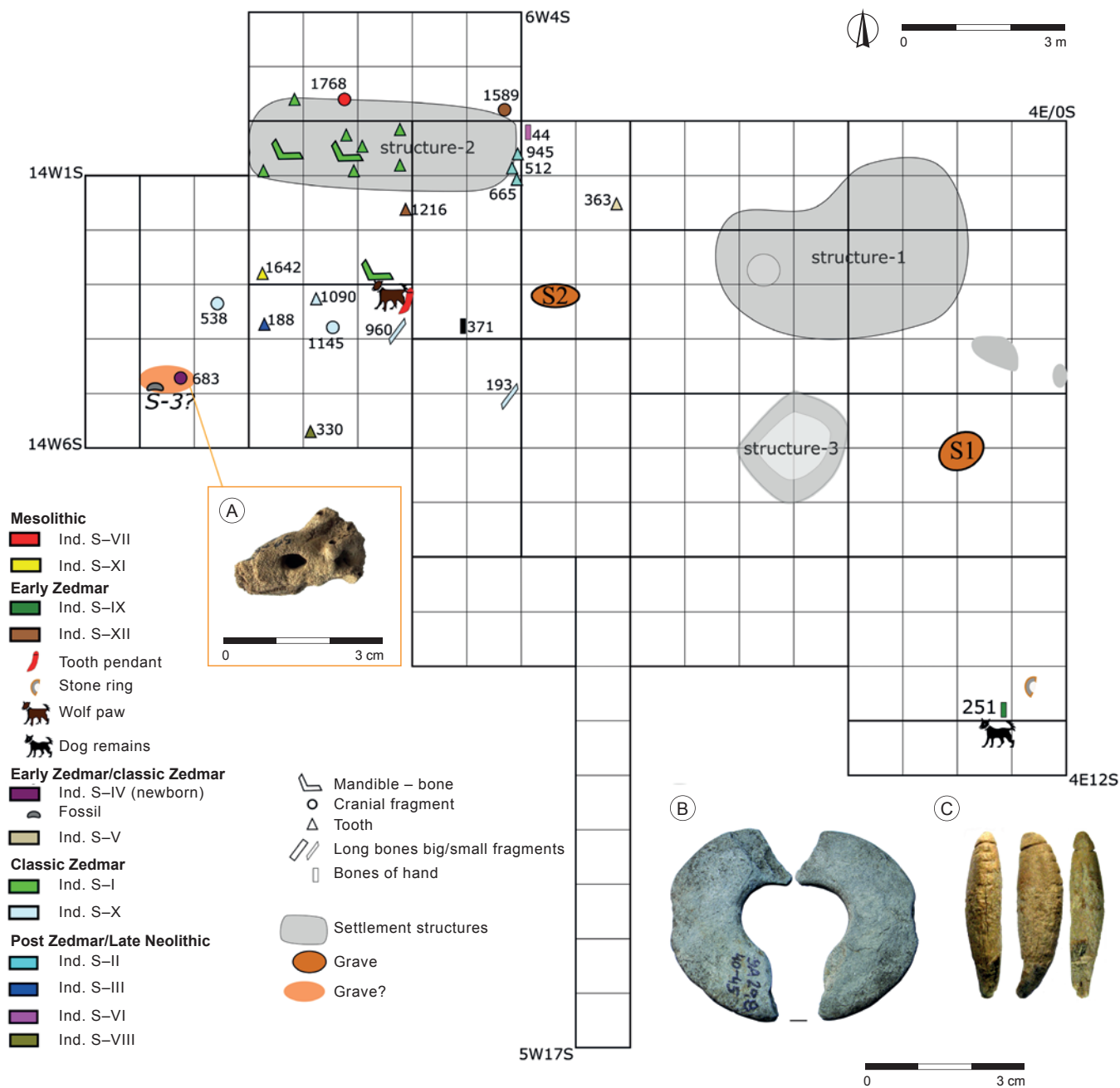


Fig. 17. Szczepanki, sector S. Distribution of loose human bones. a – pars petrosa of a newborn infant; b – stone ring, possible ornament; c – tooth pendant with the groove at the root, dog canine. Author K. Bugajska.

Obr. 17. Szczepanki, sektor S. Distribuce izolovaných lidských kostí. a – kost skalní novorozence; b – kamenný kruh, možná ozdoba; c – přívěšek ze zuby s rýhou na kořenu, psí špičák. Autor K. Bugajska.

Besides small elements, whole or larger parts of bones appeared in the early Zedmar layers: shafts of three long bones belonging to one male (?) individual (ind. E-I), which were found in a semi-anatomical position (Fig. 19). Two bones of the right forearm were found roughly 1m apart (Fig. 19: No. 1142, 1148). A femur was found in two pieces ca 2–3 m lower on the slope (Fig. 19: No. 1250/1265). Taking into account the location of bones, it seems possible that the deceased was placed on his back with legs turned towards the lake. The skeleton was probably accompanied by ornaments. A whole wild boar incisor appeared between pieces of the femur shaft, whereas an amber pendant was found ca 1 m north of the long bones (Fig. 19).

Another larger bone is half of the mandible of individual E-II, which was found right at the lakeshore. The mandible was destroyed by lake water, because the teeth and one bone fragment were spread in the detritus layer over an area of ca 4 m² (Fig. 19). This could be a remnant of a washed-out burial. It should be noted, however, that there were no human bones in the littoral zone, though a large area was excavated. Moreover, only right teeth are present (Fig. 19: a), so most likely only half of the mandible rather than the whole bone was scattered by the water. It may suggest that most bones of this individual could have been taken, and only a broken (?) half of the mandible was left and washed out by the lake.

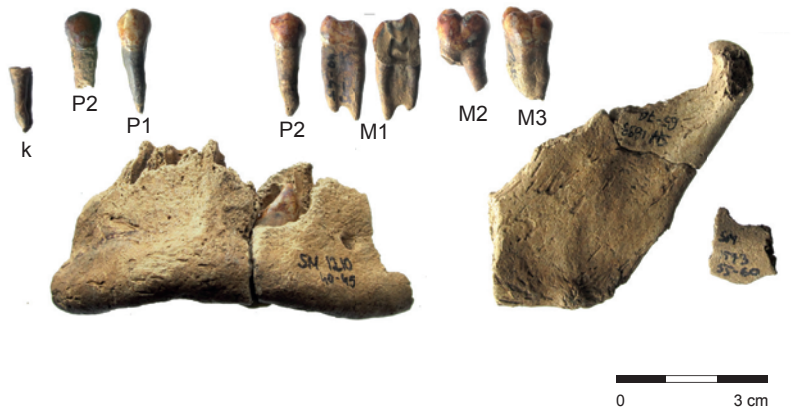


Fig. 18. Szczepanki, sector S. Mandible of individual S-I, 16–20 years old, found in settlement structure 2. Photo by K. Bugajska.

Obr. 18. Szczepanki, sektor S. Dolní čelist jedince S-I, věk 16–20 let, nalezená vsídelní struktuře 2. Foto K. Bugajska.

In general, the anatomical structure of human remains as well as the location on the sloping shore indicate that this area was used for temporary burials. Most of the remains were probably lost and overlooked. The exceptions are three long bone shafts, which could have been intentionally left at the place of temporary burial. The same may apply to the washed-out part of the mandible. Moreover, the distribution of loose human bones overlaps with the spread of amber adornments (Fig. 19). Temporary burials were deposited mostly on the slope between the encampment and the shoreline. Occasionally, such burials were placed right at the shoreline, which is indicated by the mandible (ind. E-II) from the eastern part of the shore and the tooth of individual E-IX along with amber adornments from the southern part (Fig. 19).

At Szczepanki, temporary burials were deposited in similar frequency in the early and classic Zedmar, a practice that is not as certain for other periods. Only a single blackened skull piece came the Late Mesolithic. It could also have come from the skull kept at the settlement. In turn, mostly cranial fragments occurred in the latest layers and closer to the encampment. However, it is not certain if the bones are remnants of temporary burials or of skulls kept at the settlement. Moreover, it is also not ruled out that the bones are older than the layer.

It should be added that in sector 'E' numerous bones of dogs were found (Gumiński 2021). Most of them lay right at the shoreline or even in the littoral zone (Fig. 19). At least five washed-out dog skeletons were identified, which are represented by different numbers of bones scattered along the shore. In some cases, bones remained in anatomical connection or in a semi-anatomical relationship, suggesting that they were mostly primary dog burials sunken and washed out by the lake. Dog bones also appeared higher on the slope, where human bones were found, but they were not so numerous and disarticulated (Gumiński 2021). It seems that there were two separated burial areas, one intended for temporary human burials on the slope and the second for dog burials and located along the entire excavated shoreline (Fig. 19).

4.6 Comparison of different settlement areas

The largest number of loose human bones come from the eastern bay, trench III, at Dudka. This undoubtedly indicates the unique character of this place, especially of the sloping shore used mostly for ritual and funeral purposes rather than for simple settlement activity. Fewer loose human bones were found in the settlement on the southern bank of Szczepanki island (sectors 'E' and 'S') and in the second main settlement zone at Dudka, i.e. on the southern promontory (trenches I, II, XII).

4.6.1 Dudka trench III – area intended mostly for temporary burials

The greatest anatomical diversity of the remains and, at the same time, equal proportions between the given parts of the skeleton, occur in the eastern bay in Dudka (trench III) during the classic Zedmar period (Fig. 20). At least 42 bones come from this time. Crania comprise 21% of the minimum number of bones and were present in 56% of identified skeletons (MNI: 16). Postcranial bones come from different parts of the skeleton. Long bones of both extremities and foot bones are the most frequent category (19% for each group). Other skeletal elements, such as vertebrae, scapula, pelvis and patella are also present, but are not as frequent. Less common categories are hand bones and scapulae represented by single specimens. There is also a relatively large number of loose teeth, 13 specimens, which comprise 11% of bone fragments, and come almost equally from the mandible and maxilla (Fig. 20; Appendix 1). Interestingly, mandibles are represented almost exclusively by loose teeth and one very small piece of bone (Appendix 1), suggesting that single cranial bones were often intentionally left, which is why they are so well represented (56% of individuals), but mandibles were always removed from the temporary burial place. The bone structure and their location at the sloping shore indicate that remains are probably exclusively connected with temporary burial ritual.

In the Mesolithic and early Zedmar layers of trench III, loose human bones are less numerous than in the classic Zedmar (Appendix 1), and there are some slight differences in anatomical structure as well (Fig. 20). Skulls make up 33% of the minimum number of bones, i.e. higher than in the classic Zedmar. Importantly, small bones of the hands and feet are equally common and have the same share as skulls (33%). Other postcranial bones, such as long bones of the legs and fragments of the pelvis and vertebrae appeared as well, but usually there were just single specimens for each group (Fig. 20). In the Mesolithic and early Zedmar, we can generally speak of the dominance of small skeletal elements, such as loose teeth (19% of bone fragments) or bones of the hands and feet (Appendix 1). Moreover, skulls and long bones are represented exclusively by small fragments, never by whole bones, as in the classic Zedmar. In general, the remains come from temporary burials and the location of bones is the same as in the classic Zedmar period. The greater share of crania may result from the fact that skulls were occasionally kept at the settlement. On the other hand, crania are present in 45% of 11 determined individuals for the Mesolithic and early Zedmar, whereas in the classic Zedmar it was 56%, probably because whole cranial bones were left intentionally at the temporary burial place at that time. It should be noted that mandibles

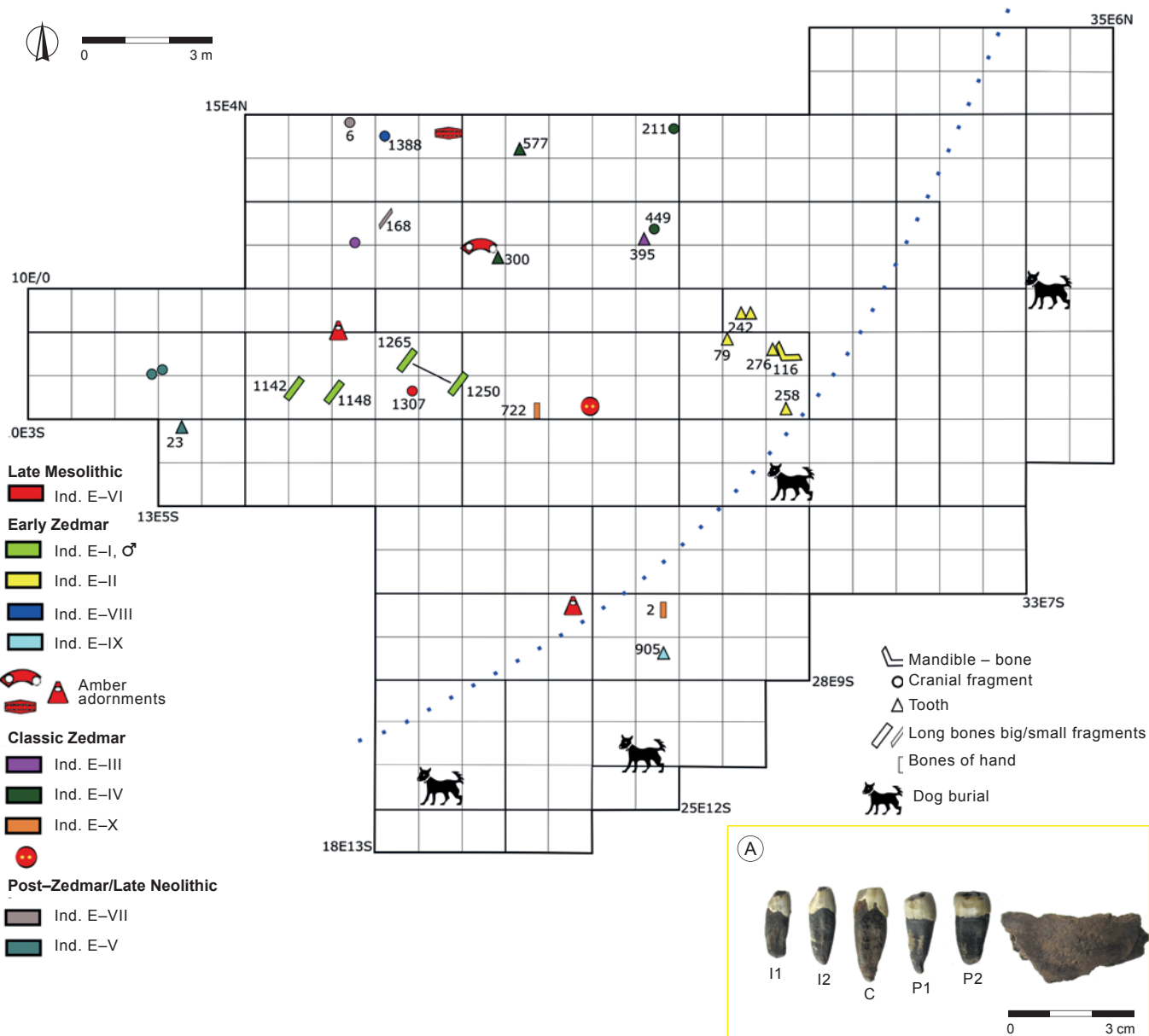


Fig. 19. Szczepanki, sector E. Distribution of loose human bones. a – mandible of individual E-II, 30–40 years old, found in littoral zone. Author K. Bugajska.
Obr. 19. Szczepanki, sektor E. Distribuce izolovaných lidských kostí. a – dolní čelist jedince E-II, věk 30–40 let, nalezena v pobřežní zóně. Autor K. Bugajska.

are not present, except from single lower teeth, similar to the situation in the classic Zedmar (Fig. 20; Appendix 1).

The eastern bay at Dudka (trench III) was probably the most important settlement area connected with multi-step burial rite, which was used not only by the local settlers of the island. First, the large increase in temporary burials concerns only the eastern bay at Dudka (trench III), not the Szczepanki site. In turn, temporary burials were probably not deposited at all on the southern promontory at Dudka (trench I, II, XII), or only occasionally close to the shoreline in trench II. Secondly, the shore in trench III at Dudka was less intensively used for settlement purposes than the south-eastern shore at Szczepanki. Finally, it seems that this area of temporary burial grounds of the eastern bay at Dudka (trench III) was somehow marked. This role may have been played by pits with special ritual deposits found on the boundary of the temporary burial zone and the settlement. Pits are dated to the Late Mesolithic and early Zedmar period and human remains appeared close to them. Whole bones of the

deceased left on the sloping shore in the classic Zedmar period could also have been used as some type of marker. It should also be added that a special painted wooden stick was found directly in trench III in the Late Mesolithic layer. It was painted in a spiral pattern with tar. It is not ruled out that the stick was a kind of elder or shaman stick, which could have been used in funeral ceremonies or in the ancestor cult (Gumiński, Bugajska 2023).

4.6.2 Szczepanki – site with temporary burials at the settlement

The human remains from Szczepanki are generally interpreted as remnants of temporary burials, though anatomical structure differ from those described above for trench III at Dudka (Fig. 20; Appendix 2).

Skulls have a greater share there and comprise 46% of the minimum number of bones while being present in the case of 59% of determined individuals (Fig. 20). Moreover, upper teeth are much more frequent than loose mandibular teeth. At least nine sets of upper teeth were distinguished at Szczepanki, but

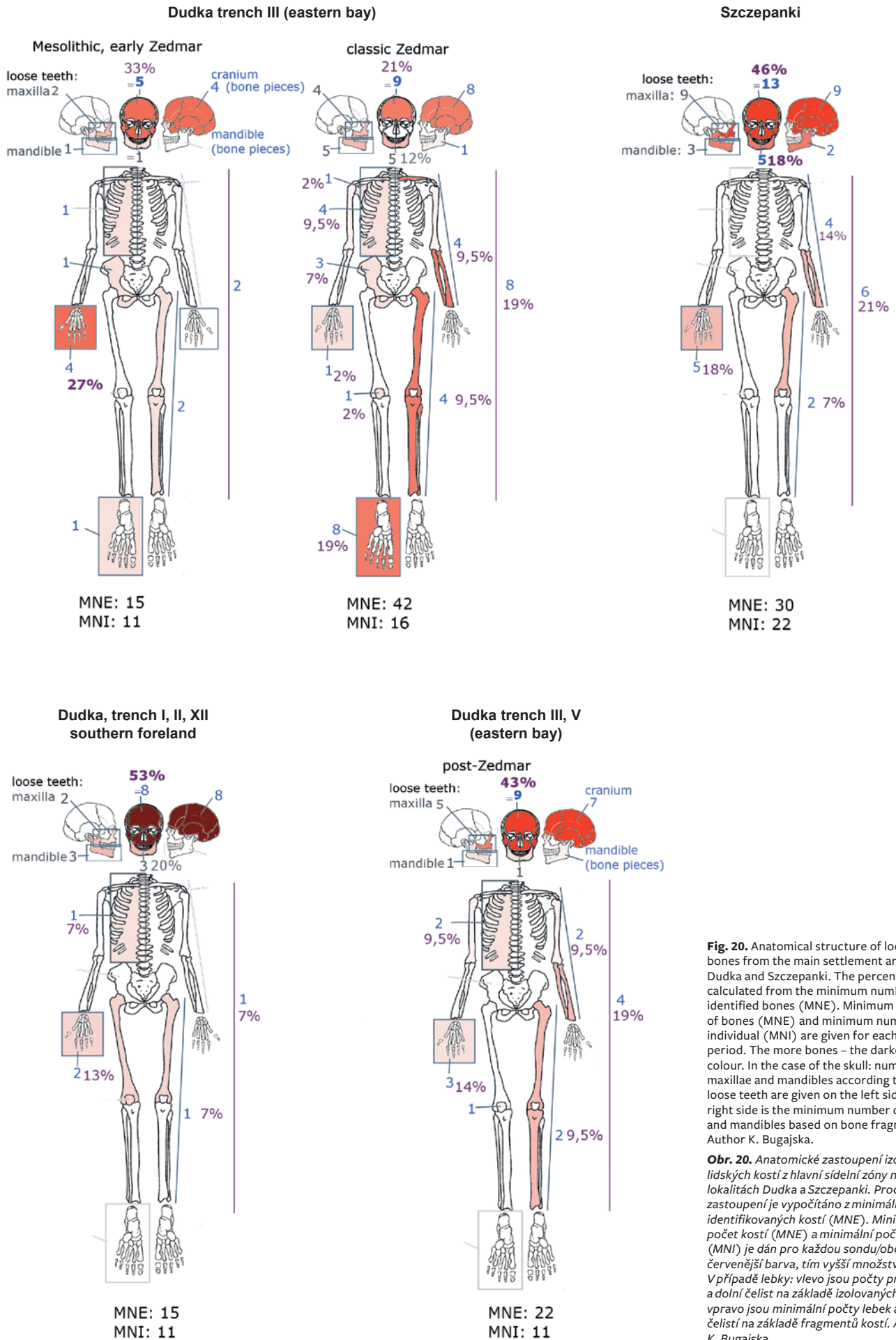


Fig. 20. Anatomical structure of loose human bones from the main settlement areas at Dudka and Szczepanki. The percentage is calculated from the minimum number of identified bones (MNE). Minimum number of bones (MNE) and minimum number of individual (MNI) are given for each trench/period. The more bones – the darker the red colour. In the case of the skull: numbers of maxillae and mandibles according to sets of loose teeth are given on the left side, on the right side is the minimum number of skulls and mandibles based on bone fragments. Author K. Bugajska.

Obr. 20. Anatomické zastoupení izolovaných lidských kostí z hlavní sídelní zóny na lokalitách Dudka a Szczepanki. Procentuální zastoupení je vypočítáno z minimálního počtu identifikovaných kostí (MNE). Minimální počet kostí (MNE) a minimální počet jedinců (MNI) je dán pro každou sondu/období. Čím červenější barva, tím vyšší množství kostí. V případě lebky: vlevo jsou počty pro lebku a dolní čelist na základě izolovaných zubů, vpravo jsou minimální počty lebek a dolních čelistí na základě fragmentů kostí. Autor K. Bugajska.

only three sets of lower teeth. While to a certain extent this could be connected to the occasional storage of skulls at the settlement, there is no clear evidence for such a custom. On the other hand, skulls are represented mostly by loose maxillary teeth and additionally by single small cranial bone fragments. If any crania were kept there as memorabilia, they were eventually taken to another place, with only small broken pieces of bone and loose teeth remaining at Szczepanki. Therefore, the more probable scenario is that the cranial pieces and maxillary teeth come from temporary burials. It should also be added that the maxilla is more prone to damage than the mandible, which could be the reason upper teeth occur more frequently than lower ones.

Interestingly, mandibles represented by bone fragments with teeth appeared at Szczepanki, whereas such finds are unknown from Dudka encampment areas in trench I and trench III. Moreover, the mandibles appeared in two different circumstances. One was found in the pit at the settlement, where it was probably stored, the second in the littoral zone as a remnant of a temporary burial (Fig. 17–19; Appendix 2). At Dudka, whole or half mandibles are known only from the cemetery and from possible destroyed graves in trench IV (Fig. 5, 6; Appendix 1).

Postcranial bones are less frequent at Szczepanki than in classic Zedmar layers at Dudka (Appendix 1, 2). Small skeletal elements come exclusively from the hands and are equally as frequent as different long bones (Fig. 20).

It should be added that there are differences between sector 'S', i.e. the encampment zone, and sector 'E', i.e. the lake-shore used for settlement purposes. Loose teeth are more frequent than cranial bone fragments in sector 'S' and postcranial bones are rare (Appendix 2). In turn, the number of loose teeth, cranial bones, and postcranial elements is more balanced in sector 'E' (Appendix 2). Additionally, three whole long bones were found in sector 'E'. They were probably left in a temporary burial place, as was practiced in trench III at Dudka. Sector 'S' then yielded only two small pieces of long bone shafts. Human remains from sector 'S' show more similarities to Mesolithic layers in trench III or to emptied graves at the cemetery, whereas sector 'E' seems to be more analogous to the eastern bay at Dudka in the classic Zedmar periods, though the number of bones is decidedly lower.

Temporary burials from the eastern bay at Dudka as well as at Szczepanki island were often equipped with adornments. At the eastern bay at Dudka, human bones were accompanied by amber ornaments in the early Mesolithic, whereas in classic Zedmar, there were mostly minimum bone number (MNE) tooth pendants. At Szczepanki loose human bones were usually found along with different amber adornments, but rarely with tooth pendants. Interestingly, such adornments were not found at the main cemetery at Dudka, neither those made of the amber nor of animal tooth (except one piece found near an emptied grave). Instead, unworked animal teeth and belemnites were added to the graves as a symbolic goods or possible clothing ornaments (Gumiński 2017; Gumiński, Bugajska 2016; 2023). This rule applies not only to secondary burials, i.e. to bones brought from the temporary burial place, but also to primary ones. It may suggest that human bones were only taken from temporary burials, but grave goods and clothing applications were left or lost. Moreover, it seems that very strict rules were applied for the funeral dress of the deceased, and they were different for temporary burial at the settlement and for primary burial at the main cemetery.

4.6.3 Bone storage at the encampment as a main ritual practice

The storage of human bones at the encampment was recorded as the main ritual practice for two settlement zones. The first such area was located in trench I on the southern foreland

at Dudka. It probably concerns all human remains found there. At the southern promontory (trench I), the storage of bones took place with the same intensity in the classic Zedmar and post-Zedmar periods. The second case is trench III on the eastern bay at Dudka, though the practice falls mostly in the post-Zedmar period. In both cases, the anatomical structure of the bone assemblage is different than in the areas used for temporary burials (Fig. 20).

Crania are dominating in bone assemblages comprising 53% of the minimum bone number in southern foreland – trench I, II and XII, and 43% in the eastern bay – trench III and V (Fig. 20; Appendix 1). As a result, most of the determined individuals from these areas are represented by the cranium, 88% in the eastern bay, and 67% in the southern foreland. Despite the high frequency of cranial fragments, maxillary teeth are not as numerous, and this applies to both analysed settlements. Moreover, mandibles are not present and lower teeth are rare as well, suggesting that almost toothless crania were kept at these settlements and separated mandibles were taken to other places.

Interestingly, mandibular teeth in trench I come exclusively from subadult individuals, whereas skulls belong to adults. It is possible that mandibles were kept there, but this applies only to children. Selected long bones, especially femurs (?) could have been kept at the settlement, too. In trench III, the share of postcranial bones is slightly greater than in trench I (Fig. 20), but it is not ruled out that some of these bones come from temporary burials still deposited there in the post-Zedmar period.

There is a distinctive difference between trench I and the post-Zedmar layer in trench III concerning the preservation of bones. In trench III, crania are usually represented by larger numbers of bone fragments, and it was more or less possible to reconstruct them (Fig. 13, 14). In turn, crania from trench I are much more fragmented and poorly preserved (Fig. 15, 16). Some of the bone pieces are even accidentally blackened due to exposure to fire (Fig. 16). It may suggest that in the case of the post-Zedmar layer in trench III, the storage of selected bones of the deceased was still practiced. Cranial bone fragments in trench I belong to skulls previously kept at the settlement and finally taken to another place. As a result, the lost bone pieces were simply trampled and accidentally burned.

4.7 Final remarks and discussion

The settlement zones of both Dudka and Szczepanki islands differ not only in the number of loose human bones, but also in the anatomical structure of the human remains, a different degree of their fragmentation and destruction as well as the exact context in which human remains appeared. Considering all this data, it was possible to distinguish areas at the sites where: mostly temporary burials were deposited; encampments where only selected bones of the deceased were kept as well as the cemetery periphery where graves were destroyed by the Late Neolithic settlement activity (trench IV).

The eastern bay at Dudka (trench III) was the main area intended for temporary burials, which were located on the slope between the encampment and the lake shoreline. The first examples of this custom date back to the Early Mesolithic and temporary burials were deposited there continuously during the Late Mesolithic and early Zedmar period, until the end of the classic Zedmar. The settlement at Szczepanki island was the second area where temporary burials were the main ritual practice. It falls in the early and classic Zedmar period, and in both cases, it was an equally frequent custom. The remains of the dead collected at Szczepanki were most probably taken to the main cemetery at Dudka, since at Szczepanki apart from loose

human bones only primary burials of small infants were found. The temporary burial custom was probably abandoned in the post-Zedmar period, because there is no clear and unquestionable evidence for its continuity in that time. It should be noted that the main cemetery at Dudka was no longer used at the same time, and the funerary area was moved to the island interior. The general change in burial customs could have occurred in the post-Zedmar period (Bugajska 2023, 128–130).

The storage of the bones of the deceased in the settlement concerns mainly two main settlement zones in Dudka, i.e. the southern foreland (trench I) and the eastern bay (trench III). Occasionally, it could also take place in the settlement at Szczepanki. At Dudka, mostly skulls were kept at the encampment, while at Szczepanki such a practice is proven with certainty for a mandible. It should be added that crania and mandibles are most frequent among partial secondary burials, i.e. represented by single bones (Fig. 6B). It clearly indicates that such distinctive bones were preferred in the funeral ritual as well as in a kind of ancestor cult.

It should be noted that possible memorabilia are not recorded for the Mesolithic period. The practice of bone storage could have been introduced already in the early Zedmar period, but it was a rather infrequent custom. More evidence of memorabilia comes from the classic Zedmar period, mainly from the eastern foreland (trench I) at Dudka. In turn, a very distinct increase of possible memorabilia occurred in the post-Zedmar period at the eastern bay at Dudka (trench III). It was even the main ritual activity related to the ancestor cult practiced there at that time.

With the exception of the main Dudka cemetery, the eastern bay at Dudka (trench III) was probably the most important area connected with the multi-step burial rite as well as with the possible ancestor cult. It seems that this area was used not only by local settlers occupying this encampment zone, but it could have been a ritual area for the entire Lake Staświn microregion, as is suggested by the large increase in loose human bones, i.e. temporary burials, in the classic Zedmar period, which was not observed at the Szczepanki site or the southern foreland at Dudka (trench I). Temporary burials appeared here already in the Early

Mesolithic and were deposited continuously until the end of the Zedmar period. The funeral area was probably specially marked and protected by the bones of ancestors intentionally left there or by special deposits made in the pits at the boundary with the settlement zone. Moreover, the encampment at the eastern bay was the main area where skulls of the dead were kept in the post-Zedmar period. This suggests that this area probably remained the most important for ritual practices, but as a place for the ancestor cult at the settlement.

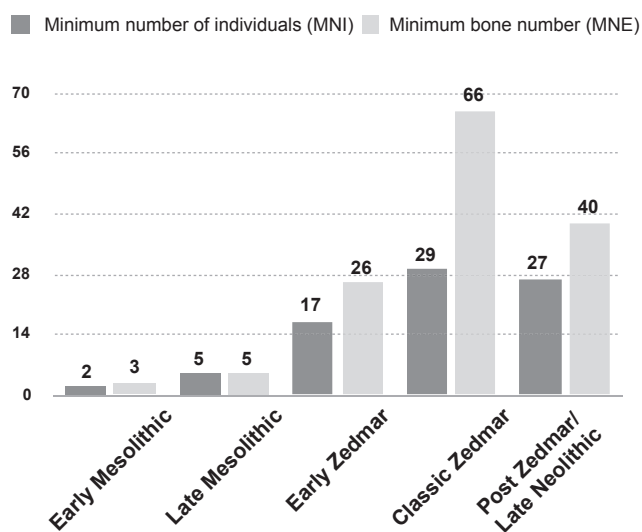
The number of loose human bones increased in the Para-Neolithic, i.e. from the early Zedmar, and the apogee falls in the classic Zedmar period (Graph 3). This tendency applies especially to temporary burials. At the same time, cremation was introduced that was an alternative multi-step burial custom (Bugajska 2023; 2024). This can be explained by the change in the settlement strategy, from seasonal camps to year-round occupation on both islands in the Para-Neolithic, and with population growth in the classic Zedmar (Gumiński 1995; 1999; 2004; 2012). The increasing role of multi-stage funeral rites and the ancestor cult may result from these circumstances. It could become very important in the Para-Neolithic to emphasise the local origin and connections to a particular clan or family.

The burial customs may depend on the age of the deceased. Multi-step burial rites were not used with the youngest children under the age of 1.5 years and they were probably buried directly at the settlement at which they died. Such small infants are not present at the main cemetery and their loose bones are also very rare. Primary burials of 6-month-old infants are known only from the Szczepanki site. The *pars petrosa* from sector ‘S’ at Szczepanki could be a remnant of a third such burial. A part of the occipital bone of a newborn infant appeared in the classic Zedmar layer in trench III at Dudka. It is a unique example of such a small child at the Dudka site, which was probably buried at the sloping shore with the temporary burials of older individuals, not directly at the encampment as infants at Szczepanki. In both cases, burials of infants appeared in the same area where temporary burials of older individuals were deposited.

5. Conclusion

Dudka and Szczepanki yielded rich evidence of multi-step burial rites. On the one hand, there were numerous secondary burials deposited in the pits as well as directly on the ground of the cemetery at the main cemetery at Dudka and, on the other hand, there are numerous loose human bones in the settlement areas that are mostly remnants of temporary burials. Moreover, graves at the cemetery were intentionally disturbed to collect bones or even whole skeletons of the deceased. Selected bones, usually skulls, were also kept at the settlements. Precise analyses of loose human bones revealed significant differences in complex burial rites in particular chronological periods as well as between the main settlement zones of both islands.

Dudka and the neighbouring site Szczepanki are unique sites on the European Plain regarding the complex multi-step burial customs of Stone Age hunter-gatherers. Sites with formal burials, usually from the Mesolithic and Para-Neolithic, are known, including large cemeteries such as those at Vedbæk in Denmark, Skateholm in Sweden and Zevejnieki in Latvia (Albrethsen, Brinch Peteresen 1977; Larsson 1983; 1984; 1989; Nilsson-Stutz 2003; Zagorskis 2004; Louwe Kooijmans 2007; Bugajska 2014; Grünberg 2016; Gumesson, Mollin 2016). On the other hand, there is a long list of Mesolithic sites spread over the entire European Plain where only loose human bones were found, without any proper burials (see, for instance: Meiklejohn, Denson 1987; Louwe Kooijmans 2007; Gray Jones 2011; Orschied, Kind 2016;



Graph 3. Loose human bones at Dudka and Szczepanki. Number of bones and individuals in different chronological periods.

Graf 3. Izolované lidské kosti z lokalit Dudka a Szczepanki. Počet kostí a jedinců v různých chronologických obdobích.

Sørensen 2016). Secondary or disturbed burials are present at different sites and cemeteries, but usually they do not co-occur with the presence of loose human bones, especially so numerous, that could be interpreted as temporary burials (e.g. Nilsson-Stutz 2003; Louwe Kooimans 2007). The closest analogies to Dudka seem to be the Para-Neolithic site of the Pitted Ware culture in Ajvide on Gotland and the Late Mesolithic Hardinxveld sites, Polderweg and De Bruin, in the Netherlands. A large assemblage of loose human bones was found at the Ajvide site of at least 1,122 bone fragments dispersed all over the site and in different layers (Wallin 2013, 56–58). Examples of secondary burials and intentionally disturbed burials are also recorded at this site (Wallin 2013, 55–56). In turn, Hardinxveld sites yielded in total 90 human bones. The majority of these remains come from the site Polderweg, where one grave with secondary burials was uncovered as well (Louwe Kooimans et al. 2016: 599–602, Tab. 2, 3). It seems that there was similar difference between the neighbouring sites in their importance for the local burial rites, as it is proven for Dudka and Szczepanki sites.

The multi-step burial rite recorded at Dudka and Szczepanki sites was probably a locally developed custom practised from the

Early Mesolithic in the Lake Staświn microregion. The pinnacle of these practices occurred, however, in the Para-Neolithic period, especially in the classic Zedmar, due to the increase in settlement activity and population growth. Most temporary burials fall into that time period. The settlement area at the eastern bay of Dudka played a special role as a place where temporary burials were deposited and possibly other rituals connected with the ancestor cult took place. The custom of temporary burial was probably no longer practised in the post-Zedmar period, i.e. at the same time the main cemetery was also abandoned. This indicates that the local burial customs changed and the funerary activity was ultimately moved into the interior of Dudka island in the Late Neolithic. Surprisingly, the storage of bones at the settlement continued in the post-Zedmar period at least at the eastern bay of Dudka, which probably remained the most important area for the ancestor cult possibly until the end of the Stone Age.

Acknowledgements

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Appendix 1

Trench	Individual C. – cranium M. – mandible S. – postcranial skeleton s.t. – set of teeth	Age	Sex	Cranium	Mandibles	Loose teeth	Upper extremity – long bones			Lower extremity – long bones			Foot				NUMBER OF FRAGMENTS	MINIMUM NUMBER OF BONES	Archaeological period	Blackening
							carpals	metacarpals	phalanges	Patella	tarsals	metatarsals	phalanges	Scapula	Pelvis	Ribs				
I	I-A	5–6 years	–	1		2: lmd											3	2	Zedmar	
I	I-B	11–12 years	–			lmd											1	1	post-Zed	
I	I-C, C. #1	Adult	–	8: Tl, P, O		lmx											9	1	post-Zed	
I	I-D, C. #2	20–25 years	–	8: Pl, O		2: lmx		2	7: Fl								19	4	Zedmar	+
I	I-E	2–3 years	–			lmd											1	1	post-Zed	
I	I-F, C. #3	Adult	♂?	2: P													2	1	post-Zed	+
I	I-G, C. #4	Adult	–	1 O+T													1	1	Zedmar	
I	I-H	Adult	–	2: P				1									4	3	Zedmar	
I	Unmatched	–	–	10: P, O					1: F?								11	–	–	
I	8 individuals	–	1♂	32/6		7/2 mx, 3md		3	8/1								51	14	–	
II	II-A	Adolescent	–														1	1	Zedmar	
II	II-B	Adult	–	1: P?													1	1	post-Zed	
II	2 individuals	–	–	1/1													2	2	–	
XII	XII-A	Juvenis	–	4: F													4	1	Zedmar	+
XII	XII-B	Adult	–	3: P													3	1	Zedmar	
XII	Unmatched	–	–	2													2	–	Zedmar	
XII	2 individuals	–	–	9/2													9	2	–	
I, II, XII	min.12	–	1♂	42/9	–	7/2 mx, 3md		3	8/1								62	18	–	
III	III-A, s.t. #1	20–24 years	–			3: 1mx, 2md											3	2	E. Meso	
III	III-B, S. #1	Adult?	–										1r				1	1	E. Meso	
III	III-C, S. #2	Inf. II	–						1: Tr								1	1	L. Meso	
III	III-D, s.t. #2, C. #1	Maturus	–	1: F		2mx											3	1	L. Meso	
III	III-E, C. #2	30–40 years	♂?	2: F													2	1	e. Zed	
III	III-F, C. #3	Adult	–	4: Pr Pl													4	1	e. Zed	
III	III-G, S. #3	Adult	♀?					1 r	2	2: F/T							5	4	e. Zed	
III	III-H, S. #4	Adolescent	–						1					1	1		3	3	e. Zed	

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Trench	Individual C. - cranium M. - mandible S. - postcranial skeleton s.t. - set of teeth	Age	Sex	Cranium	Mandibles	Loose teeth	Upper extremity – long bones			Lower extremity – long bones			Foot				NUMBER OF FRAGMENTS	MINIMUM NUMBER OF BONES	Archaeological period	Blackening		
							carpals	metacarpals	phalanges	Patella	tarsals	metatarsals	phalanges	Scapula	Pelvis	Ribs					Vertebrae	
III	III-I, C. #4	-	-	3-4: F, Pr												4	1	e. Zed				
III	III-AK, SZ.16	Adult	-							2: Fi l						2	1	e. Zed				
III	III-J, C. #5/6, S. #5	Adult	♂?	7: T l?, O				1								8	2	e. Zed / Zed ?				
III	III-L, S. #6	Adult	♂							1r						1	1	Zedmar				
III	III-M, S. #7, s.t. #5, C. #7	Adult	♂	3: P		3: 2mx, 1md	1: R r			2: F l r				1		10	6	Zedmar				
III	III-N, S. #8	Ca 30 years	♀				1: R r						1 r		1	3	3	Zedmar				
III	III-O, S. #9	Adult	♀				3: U l	1 r								4	2	Zedmar				
III	III-P, S. #10	Adult	?								1 l					1	1	Zedmar				
III	III-Q, C. #8, S. #12	Maturus	♂?	5: Pr, whole O											2	7	3	Zedmar				
III	III-R, C. #9 + s.t. #6?	Adult	♂?	6: F, P, Tr, O		2: 2md										8	2	Zedmar				
III	III-S, S. #13, C. #10	4–6 years	-	6: whole F, P?									1 l			7	2	Zedmar				
III	III-T, S. #14, C. #11	Juvenis	♀?	21: F, Pr, Pl, Tr, Zr, O					1: T l						1	23	3	Zedmar	?			
III	III-T? t.z. #8	16–20/22 years	-			3: 2mx, 1md										3	2	Zedmar				
III	III-U, C. #12 + C. #12/13	Adult?	♀?	7: F, P?, Tl												7	1	Zedmar				
III	III-V, C. #14	Newborn	-	1: O												1	1	Zedmar				
III	III-W, S. #11	Adult	♀				1: Cr				4 l	2 p				7	6	Zedmar				
III	III-X, s.t. #7	Ca 10–11 years	-			3: 2 mx, 1 md										3	2	Zedmar				
III	III-Y, s.t. #10	9–10 years	-			1 mx										1	1	Zedmar				
III	III-Z, C. #15	Juvenis/ Adultus?	-	12: F, Pl												12	1	Zed / p. Z				
III	s.t. #9, M. #1, III-T/R?	18–22 years	-		1	1 md										2	1	Zedmar				
III	Unmatched	Adult	-	10: Mx, F/P?					1: Fi		2 p?					13	3	Zedmar				
III	Unmatched	Subadult	-								1					1	1	Zedmar				
III	III-K, s.t. #4 (from pit)	Ca 12,5 years	-			1 mx										1	1	post-Zed				
III	III-AA, C. #1	Adult	-	10: F, Tl, Tr							1					11	2	post-Zed				
III	III-AB, C. #17	Adult	-	3												3	1	post-Zed				
III	III-AC, C. #18	Juvenis ?	♀?	46: F, Pr, Pl, Tr, Tl, O												46	1	post-Zed	+			
III	III-AD, C. #19, s.t. #13, S. #17	20–24 years	♂	12: whole F, P		1 mx	8: Ur, R			35: Fr, T						56	5	post-Zed	+			
III	III-AE, S. #18	Adult	-								1					1	1	post-Zed				
III	III-AF	Infans II	-			1 mx					1			1		3	3	post-Zed				
III	III-AG, s.t. #12	2,5–4 years	-			3: 2 mx, 1 md										3	2	post-Zed				
III	III-AH, C. #20, s.t. #14	Adult	♂?	10: F, Pr, Tl		1 mx										11	1	post-Zed				
III	III-AI, C. #21	Senilis?	-	11: Pl, Pr												11	1	post-Zed				
III	III-AJ, C. #22	Adult	♀?	18: F, Pl, Pr, O												18	1	post-Zed				
III	Unmatched	Adult	-	10: Tl	1					1 l						14	3	post-Zed	+			
III	4 individuals	-	?	1/1		5/2 mx, 1 md	-	-	-	1/1	-	-	1	-	-	8	5	Meso				
III	7 individuals	-	2♂ 1♀	17/4			-	-	1	4	4/2	-	-	-	-	1	-	1	e. Zed			
III	16 individuals	-	4♂5♀	71/8	1	13/4 mx, 5 md	6/4	-	1	-	4/4	1	-	7	1	2/1	3	-	4	114	42	Zedmar
III	11 individuals	-	2♂2♀	120/7	1	7/5 mx, 1 md	8/2	-	-	4	35/2	1	-	-	-	-	2	178	22	post-Zed		
III	38 individuals	26 adults 10 subadults	8♂8♀	209/20	2/1?	25/11 mx, 7 md	14/6	-	2	8	44/9	2	-	8	1	2/1	4	-	7	328	82	
V	V-A	Adolescent	-	2		1										3	1					
V	1 individual	-	-	2/1		1										3	1					
VIII	VIII-A	Adult	-	5						2						7	3	p.Z. / L.N.				
VIII	VIII-A? / B?	Adult	-	1		1										2	1	L.N.?				
VIII	1 individual	-	-	6/2	-	1	-	-	-	2	-	-	-	-	-	9	4					
IV	IV-A (S. #1)	20–30 years	-	2: P, Tl		1 mx	5: Hl, Ul			5: Fl	1r					14	5	?				

Trench	Individual C. - cranium M. - mandible S. - postcranial skeleton s.t. - set of teeth	Age	Sex	Cranium	Mandibles	Loose teeth	Hand			Lower extremity – long bones	Foot				NUMBER OF FRAGMENTS	MINIMUM NUMBER OF BONES	Archaeological period	Blackening		
							Upper extremity – long bones	carpals	metacarpals		phalanges	Patella	tarsals	metatarsals					phalanges	Scapula
IV	IV-B (S. #2)	Adult	–				4: Rl, C		1	13: Fr, Fi						1	19	6 ?		
IV	C #2, ind. IV-B?	?	–	7: F?, P		2: 1 mx											9	1 ?		
IV	IV-C (M. #4)	9,5–11,5 years	–		2+4t	1 mx				1: F					1		9	4 ?		
IV	M. #1 - ind. B/D?	Adult	–		1												1	1 ?		
IV	M. #2 - ind. B/D?	Adult	–		1+1t												2	1 ?		
IV	IV-E, M. #3	Adult	–		1												1	1 L.N.?		
IV	IV-F (C. #3)	Juvenis	–	6: P, O													6	1 ?		
IV	IV-G (t.s. #1)	Ca 6 years	–			2: 1 md											2	1 ?		
IV	IV-H (S. #3)		–							4: T, F							4	2 ?		
IV	Unmatched	Adults	–	6: O?, T?	1					5: T, F, Fi?	1					1	14	2 L.N.?		
IV	8 individuals	–	–	21/3	11/4	6/3 mx, 1 md	9/4		1	28*/6	2				1	2	81	25		
XI	XI-A	9,5–11,5 years	–	13: Pl, T, O		2: 1 mx											15	1	Zed / p.Z	
XI	XI-B	–	♀?	2: F			1: U/R?										3	2	Zed / p.Z	
XI	XI-C	20–30 years	–			1 md											1	1	e. Zed	
XI	XI-D	Adult	–	1			1?			1?							2	2	e. Zed	
XI	4 individuals	–	1♀	16/3		3/1 mx, 1 md	1–2?			0–1?							21	6		
XIII	XIII-A	Infans 1		2						1: F							3	2	e. Zed	
XIII	XIII-B	Infans 2		3		2 mx	1: R?										6	2	Zed / p.Z	
XIII	XIII-A/B	Subadult		1											1		2	1	Zed	
XIII	XIII-C	Adult		6: T, Zr		1	11?			11?					1		19	3	–	
XIII	XIII-D	Adult		2						7: F/T							9	2	–	
XIII	XIII-C/E?	–			1		2?			2?							3 (+24*)	1	–	
XIII	4 individuals			14/4		3/1 mx	1-14			8-21					2		42 (+24*)	11		
IX	IX-A	30–40 years	–	3: F?, P l?													3	1	L.N.?	
IX	IX-B	Adult?	♂?							3: Fr							3	1	L.N.?	
IX	2 individuals	–	1♂	3/1	–					3*/1							6	2		
Total	68 individuals			313/43	14/6	46/19 mx, 12 md		25–39/12–13	–	2	2	8	1	2/1	4	4	10	552	150	

Appendix 1. Dudka, loose human bones from different settlement areas. Cranial bones: F – frontal, T – temporal, P – parietal, O – occipital, Mx – maxilla, Z – zygomatic bone. Long bones: H – humerus, R – radius, U – ulna, F – femur, T – tibia, Fi – fibula, C – clavicle, l – left, r – right, md – mandibular, mx – maxillary. ‘Cranium’: number of cranial fragments is given followed by information as to which bones are represented. ‘Loose teeth’ include all teeth found separately. Teeth still present in bone or fit into the sockets are calculated in the ‘Mandibles’ category. In ‘Loose teeth’ category: the total number of teeth is given first, followed by the number of lower and upper teeth. The same applies to the ‘Long bones’ category – the number of fragments is given, and then the bone name. The cranium and mandible are treated as two separate bones in the minimum number of bones. The set of loose maxillary teeth is treated as ‘one bone’ if cranial bone fragments are not present. In the summary line for each trench: number of fragments/minimum number of bone or teeth sets. In red: cremated bones. E. Meso – Early Mesolithic, L. Meso – Late Mesolithic, e. Zed – early Zedmar, Zedmar, Zed. – classic Zedmar, post-Zed, p.Z – post Zedmar, L.N. – Late Neolithic.

Příloha 1. Dudka, izolované lidské kosti z různých sídelních zón. Kosti lebky: F – kost čelní, T – kost spánková, P – kost temenní, O – kost týlní, Mx – horní čelist, Z – kost lícní. Dlouhé kosti: H – kost pažní, R – kost vřetení, U – kost loketní, F – kost stehenní, T – kost holenní, Fi – kost lýtková, C – kost klíční, l – levá, r – pravá, md – mandibulární / z dolní čelisti, mx – maxilární / z horní čelisti. „Cranium“: dán je počet fragmentů lebky a informace, které kosti jsou zastoupeny. „Loose teeth“ zahrnují všechny zuby nalezené izolovaně. Zuby, které byly nalezeny s fragmentem kosti nebo zapadají do zubních lůžek, jsou spočítány v kategorii „Mandibles“. V kategorii „Loose teeth“ je dán celkový počet zubů a přiřazení k horní či dolní čelisti. V kategorii „Long bones“ je rovněž nejprve uveden počet fragmentů a následně anatomické určení. Lebka a dolní čelist jsou považovány za dvě samostatné kosti v minimálním počtu kostí. Sada izolovaných zubů horní čelisti je považována za „jednu kost“, pokud nejsou přítomny fragmenty lebky. V souhrnném řádku pro každou sondu: počet fragmentů / minimální počet sad kostí nebo zubů. Červenou barvou: zpopelněné kosti. E. Meso – raný mezolit; L. Meso – pozdní mezolit; e. Zed – raný Zedmar; Zedmar, Zed. – klasický Zedmar; post-Zed, p.Z – post Zedmar; L.N. – pozdní neolit.

Appendix 2

Trench	Individual C. – cranium M. – mandible S. – postcranial skeleton s.t. – set of teeth	Age	Sex	Cranium	Mandibles	Loose teeth	Upper extremity – long bones			Lower extremity – long bones			Foot			NUMBER OF FRAGMENTS	MINIMUM NUMBER OF BONES	Archaeological period	Blackening
							carpals	metacarpals	phalanges	Patella	tarsals	metatarsals	phalanges	Scapula	Pelvis				
E	E-VI	Adult	–	1: P												1	1	L. Meso	+
E	E-I	Adult	♂?				2: Rr, Ur			3: Fl						5	3	e. Zed	
E	E-VIII	Adult	–	1: P												1	1	e. Zed	
E	E-IX	35–40 years	–			1 mx										1	1	e. Zed	
E	E-II	30–40 years	–		1+5t											6	1	Zed./e. Zed	
E	E-III	Ca 5 years	–	1		1 mx										2	1	Zed	
E	E-IV	20–30 years	–	2: P, O		2 mx										4	1	Zed	
E	E-X	Adult	–							2 r l						2	2	Zed	
E	E-V	16–20 years	–	2: O		1 mx										3	1	p. Zed	
E	E-VII	Adult	–	1: P			1: R									2	2	L.N.	
E	10 Individuals	–	–	8/6	6/1	5/4 mx	3		2	3/1						27	14		
S	S-XI	20–30 years	–			1 mx										1	1	Meso	
S	S-VII	Adult	–	1												1	1	Meso?	
S	S-IX	Adult	–						1							1	1	e. Zed	
S	S-XII	18–22 years	–	1: P		1 mx										2	1	e. Zed	
S	S-IV	Newborn	–	1: T												1	1	Zed./e. Zed	
S	S-V	Ca 17 years	–			1 md										1	1	Zed./e. Zed	
S	S-I	16–20 years	–		2+7t											9	1	Zed	
S	S-X	16–20 years	–	2: P		1 mx	1: Rr			1: T						4	2	Zed	
S	S-II	18–22 years	–			3: 2 mx, 1 md										3	2	p. Zed	
S	S-VI	12–15 years	–						1							1	1	p. Zed	
S	S-III	Ca 3 years	–			1 md										1	1	L.N.	
S	S-VIII	16–20 years	–			1 mx				1						2	2	L.N.	
S	12 Individuals	–	–	5/4	9/1	9/5 mx, 3 md	1	1	2	1						28	16		
Total	22 Individuals	–	–	13/10	15/2	14/3 md, 9 mx	4	1	4	4/2						55	30		

Appendix 2. Szczepanki, loose human bones. Cranial bones: F – frontal, T – temporal, P – parietal, O – occipital, Mx – maxilla, Z – zygomatic bone. Long bones: H – humerus, R – radius, U – ulna, F – femur, T – tibia, Fi – fibula, C – clavicle, l – left, r – right, md – mandibular, mx – maxillary. ‘Cranium’: the number of cranial fragments is given, followed by information as to which bones are represented. ‘Loose teeth’ include all teeth found separately. Teeth still present in bone or fit into the sockets are calculated in the ‘Mandibles’ category. In the ‘Loose teeth’ category: first the total number of teeth is given, followed by the number of lower and upper teeth. The same applies to the ‘Long bones’ category – the number of fragments is given, followed by the bone name. The cranium and mandible are treated as two separate bones in the minimum number of bones. The set of loose maxillary teeth is treated as ‘one bone’ if cranial bone fragments are not present. In the summary line for each trench: number of fragments/minimum number of bone or teeth sets. In red: cremated bones. E. Meso – Early Mesolithic, L. Meso – Late Mesolithic, e. Zed – early Zedmar, Zedmar, Zed. – classic Zedmar, post-Zed, p. Zed – post Zedmar, L.N. – Late Neolithic.

Příloha 2. Szczepanki, izolované lidské kosti. Kosti lebky: F – kost čelní, T – kost spánková, P – kost temenní, O – kost týlní, Mx – horní čelist, Z – kost lícní. Dlouhé kosti: H – kost pažní, R – kost vřetenní, U – kost loketní, F – kost stehenní, T – kost holenní, Fi – kost lýtková, C – kost klíční, l – levá, r – pravá, md – mandibulární / z dolní čelisti, mx – maxilární / z horní čelisti. „Cranium“: dán je počet fragmentů lebky a informace, které kosti jsou zastoupeny. „Loose teeth“ zahrnují všechny zuby nalezené izolovaně. Zuby, které byly nalezeny s fragmentem kosti nebo zapadají do zubních lůžek, jsou spočítány v kategorii „Mandibles“. V kategorii „Loose teeth“ je dán celkový počet zubů a přiřazení k horní či dolní čelisti. V kategorii „Long bones“ je rovněž nejprve uveden počet fragmentů a následně anatomické určení. Lebka a dolní čelist jsou považovány za dvě samostatné kosti v minimálním počtu kostí. Sada izolovaných zubů horní čelisti je považována za „jednu kost“, pokud nejsou přítomny fragmenty lebky. V souhrnném řádku pro každou sondu: počet fragmentů / minimální počet sad kostí nebo zubů. Červenou barvou: zpopelněné kosti. E. Meso – raný mezolit; L. Meso – pozdní mezolit; e. Zed – raný Zedmar; Zedmar, Zed. – klasický Zedmar; post-Zed, p. Zed – post Zedmar; L.N. – pozdní neolit.

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Resumé

Nálezy izolovaných lidských kostí se hojně vyskytují na lokalitách z období mezolitu a paraneolitu. V úvahu však začaly být brány až v novějších studiích zabývajících se pohřebními rity z posledních dvou desetiletí. Izolované lidské kosti na lokalitě Dudka poprvé zřetelně spojil s dvoufázovým pohřebním rytmem W. Gumiński (2003); další doklady pak přinesl následující výzkum této lokality (Bugajska 2021; 2023; Bugajska, Gumiński 2016). Nejklasičtější vícefázový pohřební postup je založen na dočasném pohřbení zemřelého, dokud se nerozloží měkké tkáně; poté se kosti vyzdvihnou a přenesou do definitivního hrobu na pohřebišti (obr. 1). Počet fází pohřebního ritu se však může lišit a volně uložené lidské kosti mohou být spojeny s různými druhy rituálního chování, obzvláště pokud byly některé kosti úmyslně přeneseny na sídliště nebo pokud byly hroby na sídlišti znovuotevřeny za účelem vyzdvižení kostí zemřelého (obr. 1).

Dudka a Szczepanki jsou dvě sousední lokality nacházející se na ostrovech v bývalém jezeře Stašwin v Mazursku v severovýchodním Polsku (obr. 2). Obě lokality byly osídleny od mladšího paleolitu do mladšího neolitu (tab. 1). V mezolitu byly oba ostrovy osídleny sezónně, zatímco v paraneolitickém období let byly patrně osídleny po celý rok. Hospodářství se zakládalo až do konce doby kamenné na lovu a sběru (Gumiński 1999; 2004; 2008; 2012; Gumiński, Michniewicz 2003; Gumiński, Bugajska 2023). Paraneolitické období, tj. zemědělská kultura, je spojeno s místní výrobou keramiky kolem roku 5600 BP (Gumiński 2020).

Na hlavním pohřebišti na lokalitě Dudka (obr. 3) bylo nalezeno 28 hrobů, více než 2700 izolovaných fragmentů lidských kostí (tab. 2) a nejméně 118 jedinců. Většina hrobů na pohřebišti byla kolektivních a obsahovala různé druhy pohřbů. Sekundární

pohřby (33 %) jasně převažovaly nad primárními (11 %); velká část jedinců (44 %) byla pohřbena kremací (graf 1). Celkově bylo na lokalitě Dudka nalezeno 552 izolovaných lidských kostí mimo pohřebiště; většina z nich pochází ze sondy III (obr. 3; tab. 2; příloha 1). Na lokalitě Szczepanki byly odkryty dva primární hroby kojenců (Gumiński, Bugajska 2016, 468–470) a 55 izolovaných lidských kostí (obr. 4; tab. 2; příloha 2).

Mnoho lidských kostí nalezených mimo hrobové situace na pohřebišti z lokality Dudka vykazovalo značné známky ohoření (tab. 2), pravděpodobně kvůli specifické formě pohřbu kremací v podobě malé koncentrace uložené přímo na povrchu hřbitova (Bugajska 2023). Nacházelo se zde rovněž 952 fragmentů neohořelých kostí. Asi polovina z nich byla přiřazena ke konkrétním hrobům (tab. 2), zbytek je však třeba spojovat s jinými rituálními praktikami, a nikoli s destrukcí hrobů (Bugajska 2021, tab. 101.1). Některé lidské kosti se nacházely uvnitř a kolem konkrétních jam s potenciální pohřební výbavou. Jednalo se po většinou o malé části kostry, jako jsou například zuby nebo malé kůstky ruky či nohy (graf 2). Čtyři jámy (VI-j-2, VI-e-4, VI-e-3, VI-k/e-2) spojené s lidskými kostmi byly následně interpretovány jako vyprázdněné hroby, z nichž byla vyjmuta téměř celá kostra zemřelého (obr. 5). Na pohřebišti se nacházejí tři další případy s lidskými kostmi uvnitř jam, zde se však s největší pravděpodobností jedná o sekundární pohřby: celá týlní kost z jámy VI-e-2, lidské žebro z jámy VI-m-1 a několik lidských kostí nalezených v okolí jámy VI-h-2 (obr. 5; graf 2). Je rovněž možné, že jednotlivé kosti byly uloženy zvláště na povrchu pohřebiště. To se týká přinejmenším sedmi lebek reprezentovaných početnými fragmenty rozmístěnými po celém pohřebišti (obr. 5). Uložení na povrchu pohřebiště je potvrzeno rovněž pro jednu lidskou stoličku, která byla úmyslně zakryta kompletním želvím krunýřem (obr. 5, 7).

Sonda IV byla umístěna na ostrovní plošině poblíž hlavního pohřebiště, která byla v post-zedmarském – mladším neolitickém období intenzivně využívána pro sídelní účely (obr. 3). Izolované lidské kosti tvoří dva zřetelné shluky, které lze interpretovat jako dva zničené hroby. V severní části sondy byly nalezeny kosti z jednoho postkranialního skeletu (jed. B), jedna lebka (jed. B?) a 3–4 dolní čelisti (jed. IV-C, IV-B?, IV-D, IV-E) (příloha 1). Anatomické zastoupení lidských kostí je podobné sekundárním pohřbům na lokalitě Dudka, převládají velké a charakteristické kosti (obr. 6), jednalo se proto pravděpodobně o zničený hrob se sekundárními pohřby. Lidské ostatky roztroušené volněji v jižní části sondy (jed. IV-A) naopak pravděpodobně pocházejí ze zničeného primárního pohřbu (Bugajska, Gumiński 2016, 537).

Sonda III na lokalitě Dudka (sídlíště u východního zálivu) odkryla 328 fragmentů kostí pocházejících přinejmenším z 82 kostí alespoň 37 jedinců (tab. 2; příloha 1).

Izolované lidské kosti z vrstev staršího a mladšího mezolitu v sondě III jsou velmi vzácné (obr. 8A, 11; příloha 1). Lidské pozůstatky ze staršího mezolitu se vyskytovaly velmi blízko linie pobřeží (jed. III-A, III-B), spolu s jantarovými ozdobami, zatímco kosti datované do mladšího mezolitu (jed. III-C, III-D) byly nalezeny výše ve svahu (obr. 8A). Zdá se, že všechny mezolitické pozůstatky pocházejí z dočasných pohřbů. Nártní kost jedince III-B je pravděpodobně nejstarší lidskou kostí ze sondy III (obr. 8: No. 67; 9d, f), protože uhlík ze stejné vrstvy byl datován do roku 8430 ± 190 konv. BP (Gd-4583), zatímco tři zuby jedince III-A, které již byly publikovány coby „hlavní pohřeb“, jsou o něco mladší, datované na základě vzorků uhlíků do roku 8220 ± 120 konv. BP (Gd-6701) (Gumiński 1995, tab. 1, 2; 1999, tab. 1, 2; 2008, obr. 3, 4; Gumiński, Bugajska 2016) (obr. 8A; 9: a–c; e). Lidské pozůstatky z mladšího mezolitu (jed. III-D) se pak vyskytly poblíž dvou jam s inventářem rituálně-symbolického charakteru (obr. 8, 11: g–i). V jedné z jam, datované do roku 7610 ± 55 konv. BP (Ki-5722), byla

uložena sekera z parohu a jeden pazourkový mikrolit (Gumiński 1995; 1999; 2008); druhá, nacházející se v nejvyšším bodě svahu, obsahovala lebku pratury. Lidské kosti z raného zedmarského období, početnější než kosti z celého mezolitu, se nalézaly na pobřežním svahu a na ostrovní plošině (obr. 8B; příloha 1). Jednalo se o 28 fragmentů kostí nejméně sedmi jedinců, včetně silně ohořelé kosti jedince III-AK nalezené ve vrstvě z mladšího neolitu, avšak přímo datované do roku 5150 ± 29 konv. BP (GrM-30003) (Bugajska 2023). Prostorové rozmístění a anatomické zastoupení lidských kostí ukazují na dvě různé rituální praktiky: dočasné pohřby ve svahu a uchovávání kostí předků (lebek) v rámci sídlíště. Výskyt izolovaných lidských kostí z vrstev klasického zedmarského období je výrazně vyšší: 114 fragmentů 42 kostí (příloha 1). Většina z nich pochází z horní části pobřežního svahu (obr. 8, 10). Lidské kosti jsou doprovázeny ozdobami, zejména přívěsky ze zvířecích zubů, obvykle ulomené v oblasti dírký (obr. 10A). Lidské pozůstatky obecně vykazují různorodou anatomickou reprezentaci s velkým podílem malých kostí, včetně izolovaných zubů. To naznačuje, že hlavní rituální praktiku představovaly dočasné pohřby. Ty se nacházely převážně v nejvyšším bodě svahu a méně často na pobřeží (jed. III-W). Většinu lidských pozůstatků lze interpretovat jako ztracené či přehlédnuté, stejně jako mnoho ozdob. Ve vrstvách klasického zedmarského období však nacházely i celé velké kosti (obr. 11, 12), které zde byly spíše zanechány úmyslně. Celé kosti se vyskytovaly na okraji plošiny a v nejvyšší části svahu a patřily nejméně čtyřem jedincům: III-Q, III-N, III-M, III-S. Kostí konkrétních koster v určitém rozsahu zachovávaly anatomické uspořádání, což umožnilo odhadnout pravděpodobnou primární pozici těla (obr. 12). Kostí v anatomické poloze se nalézaly i na pobřeží. Pravá lopatka a klíční kost jednoho jedince ženského pohlaví (III-W) ležely v nedotčeném anatomickém uložení, zatímco o 3 m níže v pobřežní oblasti byla nalezena skupina tří nártních kostí (obr. 11). Zbytek kostry, včetně lebky, chybí. Namísto kostry ženy byly v oblasti mezi kostmi pletence horní končetiny a zápěstními kostmi nalezeny fragmenty dolní čelisti psa. Naznačuje to, že většina kostí odsud byla odnesena, spíše než odplavena; jednalo se tedy pravděpodobně o dočasný pohřeb.

Počet fragmentů kostí ve většině svrchních vrstev (post-zedmarské, mladší neolit) je vyšší než v klasickém zedmarském období – 178 fragmentů kostí oproti 114, odhadovaný minimální počet kostí je však nižší: 22 kosti oproti 42 (příloha 1). Naprostá většina pozůstatků se vyskytovala na ostrovní plošině, která sloužila jako tábořiště (obr. 13). Jasně mezi nimi převažovaly části lebky. Bylo nalezeno nejméně devět lebek, avšak pouze jeden postkranialní skelet – jed. III-AD (příloha 1). Stav dochování jednotlivých lebek se liší. Lebky jsou zastoupeny: celými lebečními kostmi – jed. III-AC a III-AD (obr. 14: a–j, o, p); početnými kusy různých částí lebky – jed. III-AJ, III-AI, III-AH (obr. 14: k–n, s–w); nebo pouze špatně dochovanými fragmenty – jed. III-AB (obr. 13B). Umístění pozůstatků a převaha velkých charakteristických kostí, jako jsou lebky, ukazují na uchovávání memorabilií. Je těžké odhadnout, jak dlouho byl tento zvyk provozován, zda do konce mladšího neolitu, nebo pouze v postzedmarském období.

Druhá hlavní oblast osídlení se nacházela na jižním výběžku ostrova Dudka – sondy I, II, XII (obr. 3). Lidské kosti byly nalezeny převážně v sondě I, konkrétně 51 fragmentů nejméně 14 kostí ve vrstvách klasického zedmarského a post-zedmarského období (příloha 1). Tyto kosti byly nalezeny výhradně na plošině, intenzivně využívané pro sídelní účely (obr. 15). Části lebky jasně převažují nad kostmi postkranialního skeletu. Lze určit nejméně osm lebek (sedm dospělých, jedno dítě), avšak pouze jeden postkranialní skelet, jed. I-D (obr. 16, 17). Vzácně se vyskytly izolované zuby, obzvláště horní. Zřetelná převaha lebek a velkých dlouhých kostí ukazuje na to, že zde byly uchovávány vybrané

ostatky zemřelých. Mnoho fragmentů kostí bylo náhodně ožehnuto, místy až do černa, což ukazuje na neúmyslné vystavení ohni (obr. 16). Lebeční kosti jsou navíc dochovány ve velmi malých fragmentech a žádnou z nich se nepodařilo rekonstruovat (obr. 15: a–d, 16:a). Naznačuje to, že po fragmentech kostí bylo dlouho šlapáno a že byly náhodně rozptýleny po sídlišti.

V lokalitě Szczepanki se našlo 55 lidských kostí a zubů. V sektoru S se nacházelo 28 kostí nejméně 12 jedinců; téměř všechny byly nalezeny v severozápadní části sondy, bez ohledu na jejich přesnou stratigrafickou pozici (obr. 17). Převažovaly izolované lidské zuby (příloha 2), což naznačuje, že se převážně jednalo o dočasné pohřby, které byly ztraceny. Dočasné pohřby byly umístěny přímo na sídlišti, podobně jako primární pohřby malých dětí (obr. 17). Nejasný je případ *pars petrosa* (č. 683) novorozence, jed. S-IV (obr. 17a); může se jednat o pozůstatek špatně dochovaného primárního pohřbu, vzhledem k tomu, že se jedná o nejpevnější kost kostry malého dítěte. Jedinou větší a výraznou kost v sektoru S, celou dolní čelist nalezenou ve struktuře 2 (obr. 18), je třeba interpretovat jako doklad uchování kostí předků na sídlišti.

V sektoru E bylo nalezeno 27 fragmentů kostí (obr. 19; příloha 2). Lidské pozůstatky se vyskytovaly převážně v severozápadní části sondy ve vzdálenosti několika metrů od pobřeží (obr. 19). Soubor lidských kostí obsahuje mnoho malých částí, jako jsou izolované zuby, prstní články a drobné úlomky lebečních kostí (deset fragmentů šesti lebek). Vyskytly se však i větší části kostí, například tři dlouhé kosti patřící jednomu jedinci (mužského pohlaví?, jed. E-I) nalezené v částečně anatomickém uspořádání (obr. 19: č. 1142, 1148 – kosti předloktí, č. 1250/1265 – kost stehenní) či polovina dolní čelisti v pobřežní oblasti – jed. E-II (obr. 19: a). Oblast výskytu izolovaných lidských kostí se navíc překrývá s výskytem jantarových ozdob (obr. 19). Většina pozůstatků pravděpodobně pochází z dočasných pohřbů, kdebyly ztraceny nebo úmyslně zanechány. V sektoru E se nacházelo množství psích kostí. Většina ležela přímo na pobřeží nebo v pobřežní oblasti a jednalo se o pozůstatky zahluobených a následně vyplavených psích pohřbů, povětšinou primárních (Gumiński 2021). Zdá se, že zde existovala dvě samostatná pohřebiště – jedno ve svahu, určené pro dočasné lidské pohřby, a druhé přímo na pobřeží, sloužící pro pohřbívání psů (obr. 19).

Východní záliv lokality Dudka (sonda III) představoval hlavní oblast určenou pro dočasné pohřby, které se nacházely na svahu mezi sídlištem a břehem jezera. První z nich pocházely ze staršího mezolitu a ukládání dočasných pohřbů pak pokračovalo až do konce klasického zedmarského období. Druhou oblastí a převahou dočasných pohřbů, představovalo sídliště na ostrově Szczepanki, a to ve stejné míře v raném i klasickém zedmarském období. Anatomická reprezentace kostí interpretovaných jako dočasné pohřby se v konkrétních obdobích a sídelních oblastech na obou lokalitách liší. Největší anatomickou diverzitou pozůstatků a vyrovnané poměry mezi různými částmi kostry nacházíme v sondě III na lokalitě Dudka v klasickém zedmarském období (obr. 20). V mezolitických a raně zedmarských vrstvách sondy III jsou pak izolované lidské kosti méně početné než v klasickém zedmarském období a mírně odlišné je i anatomické zastoupení: zřetelněji zde dominují malé části kostry, jako jsou izolované zuby a kosti rukou a nohou, zatímco lebky a dlouhé kosti zastupují výhradně drobné úlomky, nikdy celé kosti (obr. 20; příloha 1). Lidské pozůstatky na lokalitě Szczepanki jsou pak méně časté než v sondě III na lokalitě Dudka. Podíl lebek je na lokalitě Szczepanki vyšší, jsou však zastoupeny převážně izolovanými horními zuby a fragmenty jediné kosti (obr. 20; příloha 2). Na lokalitě Szczepanki se navíc vyskytují i kosti dolní čelisti, které z lokality Dudka neznáme. Rozdíly jsou i mezi sektory S a E na lokalitě Szczepanki, tedy mezi dočasným útpčistištěm a pobřežím,

kteří sloužilo k sídelním účelům. V sektoru S jsou izolované zuby častější než fragmenty lebečních kostí (příloha 2), zatímco v sektoru E se vyskytují nálezy izolovaných zubů, lebečních kostí a postkranálních kostí ve vyrovnanější míře; navíc zde byly nalezeny i celé kosti, nikoli pouze malé úlomky. Lidské pozůstatky ze sektoru S tedy vykazují více podobností s vrstvami ze staršího mezolitu v sondě III, zatímco sektor E je podobnější klasickým zedmarským vrstvám sondy III na lokalitě Dudka.

Ukládání lidských kostí na sídlišti pravděpodobně započalo již v raném zedmarském období, v období post-zedmarském se však stalo výrazně častějším. Jako hlavní rituální praktika je zaznamenáno ve dvou sídelních oblastech na lokalitě Dudka: na jižním výběžku (sonda I) a u východního zálivu (sonda III), avšak pouze v post-zedmarském období. V obou případech se anatomická reprezentace liší od oblastí určených pro dočasné pohřby (obr. 220). V kosterních souborech převažují lebky, jež představují většinu identifikovaných jedinců: 88 % u východního zálivu a 67 % na jižním výběžku (obr. 20; příloha 1). Horní zuby naopak nejsou tak početné, dolní čelisti se nevyskytují a kosti postkranálního skeletu se nacházejí jen vzácně (obr. 20). Sonda I a post-zedmarská vrstva sondy III se zřetelně liší ve stavu dochování kostí. V sondě III jsou lebky převážně reprezentovány početnými částmi kostí (obr. 13, 14), zatímco v sondě I pouze několika špatně dochovanými fragmenty, z nichž některé vykazují dokonce náhodné zčernání z důvodu vystavení ohni (obr. 15, 16), což dokládá časté šlapání po úlomcích a jejich ničení.

Významnou oblast spojenou s vícefázovými pohřebními rity a kultem předků představoval východní záliv na lokalitě Dudka (sonda III). Zdá se, že toto teritorium využívali nejen obyvatelé místního sídliště, ale celý mikroregion kolem jezera Staświn. Naznačuje to velký nárůst izolovaných lidských kostí, tj. dočasných pohřbů, v klasickém zedmarském období, který nepozorujeme ani na lokalitě Szczepanki, ani na jižním výběžku na lokalitě Dudka (sonda I). Tato pohřební oblast byla pravděpodobně zvláštním způsobem označena a chráněna, kostmi předků nebo symbolickými předměty uloženými v jamách na hranici sídelní oblasti. V post-zedmarském představovalo hlavní oblast, kde se uchovávaly lebky zemřelých, sídliště u východního zálivu, což dokazuje, že si toto zachovalo svůj význam pro rituální praktiky a kult předků.

Vícefázový pohřební ritus se jeví jako místní zvyk, který se počíná starším mezolitem vyvinul a byl praktikován v mikroregionu kolem jezera Staświn. Vrcholu však tyto praktiky dosáhly v paraneolitu, obzvláště pak v klasickém zedmarském období (graf 3). Ve stejné době se objevila kremace coby alternativní vícefázová pohřební zvyklost (Bugajska 2023). Mohlo jít o důsledek změny sídelní strategie od sezónních sídlišť k celoročnímu pobytu na obou ostrovech a celkového populačního růstu v období paraneolitu (Gumiński 1995; 1999; 2004; 2012). Rostoucí úloha vícefázových pohřebních ritů a kultu předků může mít příčinu právě v těchto okolnostech. Je třeba poznamenat, že v post-zedmarském období již hlavní pohřebiště na lokalitě Dudka nebylo používáno a izolované lidské kosti, které interpretujeme coby dočasné pohřby, jsou v tomto období rovněž vzácné. V mladším neolitu se pohřební oblast přesunula do vnitrozemí ostrova. Naznačuje to, že v post-zedmarském období mohlo dojít k celkové změně místních pohřebních zvyklostí (Bugajska 2021).

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